

BEFORE

THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of	)	
Duke Energy Ohio, Inc., for an Increase	)	Case No. 21-887-EL-AIR
in Electric Distribution Rates.	)	
 In the Matter of the Application of	)	
Duke Energy Ohio, Inc., for Tariff	)	Case No. 21-888-EL-ATA
Approval.	)	
 In the Matter of the Application of	)	
Duke Energy Ohio, Inc., for Approval	)	Case No. 21-889-EL-AAM
to Change Accounting Methods.	)	

SECOND SUPPLEMENTAL TESTIMONY OF

DYLAN W. D'ASCENDIS

ON BEHALF OF

DUKE ENERGY OHIO, INC.

IN SUPPORT OF SETTLEMENT

_____	Management policies, practices, and organization
_____	Operating income
_____	Rate base
_____	Allocations
<u> X </u>	Rate of return
_____	Rates and tariffs
<u> X </u>	Other: Settlement

September 22, 2022

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ATTACHMENTS:

DWD-SS-1 – Recently Authorized ROEs by RRA Ranking

DWD-SS-2 – Calculation of Price Appreciation and Volatility

DWD-SS-3 – Demonstration of Inadequacy of a DCF Related to Book Value

DWD-SS-4 – Modigliani / Miller Equation

I. INTRODUCTION AND PURPOSE

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Dylan W. D’Ascendis. My business address is 3000 Atrium Way,
3 Suite 200, Mount Laurel, New Jersey 08054.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am a Partner at ScottMadden, Inc.

6 **Q. ARE YOU THE SAME DYLAN W. D’ASCENDIS THAT SUBMITTED**
7 **DIRECT TESTIMONY AND SUPPLEMENTAL DIRECT TESTIMONY IN**
8 **THESE PROCEEDINGS?**

9 A. Yes.

10 **Q. WHAT IS THE PURPOSE OF YOUR SECOND SUPPLEMENTAL**
11 **TESTIMONY?**

12 A. The purpose of my testimony is to explain my support for the Corrected Stipulation
13 and Recommendation filed on September 19, 2022 (Stipulation) among Duke
14 Energy Ohio, Inc. (Duke Energy Ohio or the Company), the Staff of the Public
15 Utilities Commission of Ohio (PUCO or the Commission) (Staff) and nearly all
16 intervening parties to these proceedings (collectively, the Settling Parties). In
17 particular, my testimony addresses the reasonableness of the Stipulation as it relates
18 to the agreed-upon return on common equity (ROE), capital structure, and overall
19 rate of return contained in the Stipulation.¹ In explaining the reasonableness of the

¹ See, Case No. 21-887-EL-AIR, Stipulation and Recommendation, September 19, 2022, pp. 3-4. I refer to the 9.50% ROE as the “Stipulated ROE”, the 50.50% equity ratio as the “Stipulated Equity Ratio”, and the 6.86% overall rate of Return as the “Stipulated Rate of Return”.

1 Stipulated ROE, I also respond to the objections raised by Direct Testimony of Dr.
2 J. Randall Woolridge, who testifies on behalf of the Office of the Ohio Consumers'
3 Counsel (OCC), as it relates to the Company's ROE on its Ohio jurisdictional rate
4 base.

5 **Q. HAVE YOU PREPARED ATTACHMENTS TO ACCOMPANY YOUR**
6 **SECOND SUPPLEMENTAL TESTIMONY?**

7 A. Yes. I have prepared Attachments DWD-SS-1 through DWD-SS-4, which were
8 prepared by me or under my direction.

II. STIPULATED ROE, EQUITY RATIO, AND OVERALL RATE OF RETURN

9 **Q. ARE YOU FAMILIAR WITH THE COMMISSION'S THREE-PART TEST**
10 **FOR CONSIDERING THE REASONABLENESS OF A STIPULATION?**

11 A. I am aware that the Commission uses a three-part test whereby it evaluates a
12 regulatory settlement under the following criteria: (1) is the settlement a product of
13 serious bargaining among capable, knowledgeable parties; (2) whether the
14 settlement violates any important regulatory principles or practices; and (3) whether
15 the settlement, as a package, benefits customers and the public interest. Although I
16 take no position as to the other terms of the Stipulation and leave that discussion to
17 other Company witnesses, as it relates to the Stipulated ROE, Stipulated Capital
18 Structure and overall Stipulated Rate of Return, I do believe those provisions are
19 reasonable, not excessive, comparable to other similarly situated electric
20 distribution utilities and are supported by empirical data commonly used in the
21 industry to arrive at reasonable returns. Therefore, I believe the end result of those

1 components was negotiated through serious bargaining and that they do not violate
2 any important regulatory principles or practices.

3 **Q. ARE YOU FAMILIAR WITH THE TERMS OF THE STIPULATION AS IT**
4 **RELATES TO THE COMPANY'S ROE?**

5 A. Yes. I understand the Settling Parties have agreed to an ROE of 9.50%, and a
6 capital structure including 50.50% common equity and 49.50% long-term debt. I
7 further understand the overall rate of return contained in the Stipulation is 6.86%.²

8 **Q. IN GENERAL, DO YOU SUPPORT THE COMPANY'S DECISION TO**
9 **AGREE TO THE STIPULATED ROE?**

10 A. Yes, I do. Although the Stipulated ROE is somewhat below the lower bound of my
11 recommended range (*i.e.*, 9.91%) it is within the range of my analytical model
12 results. I recognize the Stipulation represents negotiations among the Settling
13 Parties regarding several otherwise-contested issues. I understand the Company
14 has determined that the terms of the Stipulation, in particular the Stipulated ROE
15 and Equity Ratio, would be viewed by the rating agencies as constructive and
16 equitable. I understand and respect that determination.

17 **Q. PLEASE NOW SUMMARIZE YOUR POSITION REGARDING THE**
18 **STIPULATED ROE.**

19 A. Although the Stipulated ROE falls below my recommended range (the low end of
20 which is 9.91%), it is within the range of the analytical results presented in my
21 Direct and Supplemental Direct Testimonies. As discussed throughout my Direct

² See, Case No. 21-887-EL-AIR, Stipulation and Recommendation, September 19, 2022, pg. 4.

1 and Supplemental Direct Testimonies, the models used to estimate the ROE
2 produce a wide range of estimates. It therefore remains my position that in a fully
3 litigated proceeding, a range of common equity cost rates between 9.91% and
4 11.91% is reasonable based on market data. Nonetheless, I recognize the benefits
5 associated with the decision to enter into the Stipulation and as such, it is my view
6 that the 9.50% Stipulated ROE is a reasonable resolution of an otherwise
7 contentious issue.

8 **Q. HAVE YOU ALSO CONSIDERED THE STIPULATED ROE IN THE**
9 **CONTEXT OF AUTHORIZED RETURNS FOR OTHER ELECTRIC**
10 **DISTRIBUTION UTILITIES?**

11 A. Yes, I have. From January 2018 through August 2022, the average and median
12 authorized ROEs for electric distribution utilities were 9.57% and 9.54%,
13 respectively³. Of the 144 cases decided during that period, 93 included authorized
14 returns of 9.50% or higher.⁴

15 **Q. ARE THERE OTHER DISTINCTIONS THAT ARE IMPORTANT TO**
16 **CONSIDER WHEN REVIEWING AUTHORIZED RETURNS?**

17 A. Yes, there are. The Company's credit rating and outlook depend substantially on
18 the extent to which rating agencies view the regulatory environment credit
19 supportive, or not. For example, Moody's finds the regulatory environment to be

³ Source: Regulatory Research Associates. Excludes Illinois and Vermont Formula Rate cases.

⁴ See Attachment DWD-SS-1.

1 so important that 50.00% of the factors that weigh in its ratings determination are
2 determined by the nature of regulation.⁵

3 Given the Company's need to access external capital and the weight rating
4 agencies place on the nature of the regulatory environment, I believe it is important
5 to consider the extent to which the jurisdictions that recently have authorized ROEs
6 for electric utilities are viewed as having constructive regulatory environments.

7 **Q. IS OHIO GENERALLY CONSIDERED TO HAVE A CONSTRUCTIVE**
8 **REGULATORY ENVIRONMENT?**

9 A. Ohio's regulatory environment is classified as "Average/3" by Regulatory
10 Research Associates (RRA), which is a widely referenced source of rate case data,
11 provides an assessment of the extent to which regulatory jurisdictions are
12 constructive from investors' perspectives, or not. Ohio ranking of "Average/3"
13 falls in the bottom one-third of the 53 regulatory commissions ranked by RRA.⁶
14 As RRA explains, less constructive environments are associated with higher levels
15 of risk:

16 RRA maintains three principal rating categories, Above Average,
17 Average and Below Average, with Above Average indicating a
18 relatively more constructive, lower-risk regulatory environment
19 from an investor viewpoint and Below Average indicating a less
20 constructive, higher-risk regulatory climate. Within each principal
21 rating categories, the numbers 1, 2 and 3 indicate relative position.
22 The designation 1 indicates a stronger or more constructive rating
23 from an investor viewpoint; 2, a midrange rating; and 3, a less
24 constructive rating. Hence, if you were to assign numeric values to
25 each of the nine resulting categories, with a "1" being the most
26 constructive from an investor viewpoint and a "9" being the least

⁵ See, Moody's Investors Service Rating Methodology: *Regulated Electric and Gas Utilities*, June 23, 2017, at 4.

⁶ Source: Regulatory Research Associates, accessed September 9, 2022.

1 constructive from an investor viewpoint, then Above Average/1
2 would be a “1” and Below Average/3 would be a “9.”⁷

3 **Q. DID YOU CONSIDER THOSE DISTINCTIONS IN YOUR REVIEW OF**
4 **AUTHORIZED RETURNS RELATIVE TO THE STIPULATED ROE?**

5 A. Yes. Across the 144 cases noted above, there was a 30-basis point difference
6 between the median return for the Top Third and Bottom Third of jurisdictions (the
7 higher-ranked jurisdictions providing the higher authorized returns, see Table 1,
8 below). As Table 1 indicates, authorized ROEs for electric utilities in jurisdictions
9 that, like Ohio, are rated Average/3 and lower range from 8.70% to 9.75%, with a
10 median of 9.50%.

Table 1: Average Authorized ROE by RRA Ranking⁸

	Authorized ROE Electric Utilities		
RRA Ranking	Top Third	Middle Third	Bottom Third
Average	9.70	9.49	9.45
Median	9.80	9.50	9.50
Maximum	10.60	10.30	9.75
Minimum	8.80	8.25	8.70

11 **Q. WHAT CONCLUSIONS DO YOU DRAW FROM THAT DATA?**

12 A. The Stipulated ROE is equal to the median authorized ROE for jurisdictions that
13 are comparable to Ohio’s regulatory environment. Taken from that perspective, the
14 Stipulated ROE is a reasonable, if not somewhat conservative measure of the

⁷ Regulatory Research Associates, *RRA Regulatory Focus: State Regulatory Evaluations*, May 25, 2021, at 7.

⁸ Source: Regulatory Research Associates. “Top Third” includes Above Average/1,2,3 and Average/1; “Average” includes Average/2 and Average/3; “Bottom Third” includes Below Average/1,2,3. The “Top Third” group includes 18 of 53 jurisdictions, or about one-third of the total. See Attachment DWD-SS-1.

1 Company's ROE given increasing costs of capital as discussed in my Supplemental
2 Direct Testimony.⁹

3 **Q. PLEASE COMMENT ON THE RECOMMENDATION OF DR.**
4 **WOOLRIDGE IN VIEW OF THE HISTORICAL AUTHORIZED ROES**
5 **NOTED ABOVE.**

6 A. Dr. Woolridge recommends an ROE of 8.84%, 66 basis points below the Stipulated
7 ROE.¹⁰ Across the 144 cases noted previously, an ROE of 8.84% or below has
8 only been authorized seven times. Authorizing such an unreasonably low ROE
9 would undoubtedly have a significant negative impact on the Company's credit
10 rating and ability to access external capital. I will discuss why Dr. Woolridge's
11 recommendation is disconnected from the Stipulated ROE in detail below.

12 **Q. DO YOU BELIEVE THE STIPULATED CAPITAL STRUCTURE IS**
13 **REASONABLE?**

14 A. Yes, I do. As demonstrated in Table 2 (below) the Stipulated Equity Ratio is
15 approximately equal to the median authorized equity ratio in regulatory
16 jurisdictions like Ohio (*i.e.*, 50.48%) and is well within the range of equity ratios
17 authorized in those jurisdictions (45.00% to 54.77%).

⁹ D'Ascendis Supplemental Direct Testimony, at 4-11.

¹⁰ Woolridge Direct Testimony, at 6.

Table 2: Average Authorized Equity Ratio by RRA Ranking¹¹

	Authorized Equity Ratio Electric Utilities		
RRA Ranking	Top Third	Middle Third	Bottom Third
Average	51.14%	51.51%	50.80%
Median	52.00%	51.96%	50.48%
Maximum	56.06%	57.10%	54.77%
Minimum	41.68%	42.50%	45.00%

1 Because no two companies are identical, we should not view the average (or
2 median) equity ratio (whether authorized or observed) as a strict measure of
3 industry practice. Nonetheless, the Stipulated Equity Ratio falls well within the
4 range of authorized equity ratios and is slightly above the median for regulatory
5 jurisdictions comparable to Ohio. In my view, that finding provides additional
6 support for its acceptance.

7 **Q. HOW DOES THE 6.86% OVERALL RATE OF RETURN CONTAINED IN**
8 **THE STIPULATION COMPARE TO RECENTLY AUTHORIZED**
9 **RETURNS?**

10 A. It is quite low. Since January 2018, there have been 115 cases reported by RRA
11 (for electric distribution utilities) in which an overall rate of return was specified.¹²
12 Over those 115 cases, the median rate of return was 7.10%, 24 basis points above
13 the 6.86% rate of return contained in the Stipulation. From a slightly different

¹¹ Source: Regulatory Research Associates. Excludes capital structure decisions from Arkansas, Florida, Indiana, and Michigan, all of which include some form of non-investor supplied capital in the ratemaking capital structure.

¹² Excluding decisions related to Illinois and Vermont Formula Rate plans and from Arkansas, Florida, Indiana, and Michigan, all of which include some form of non-investor supplied capital in the ratemaking capital structure.

1 perspective, 88 of the 115 cases had overall rates of return greater than 6.86%. In
2 fact, the Stipulation's overall rate of return falls in the bottom 24th percentile of the
3 115 cases decided since 2018.

4 The low overall rate of return contained in the Stipulation is brought about by
5 the Company's rather low cost of debt. That low cost of debt is supported by
6 reasonable regulatory outcomes, including constructive decisions regarding the
7 ROE and capital structure. In my view, the Stipulation continues that support, and
8 produces the low overall rate of return on which customer rates would be set. From
9 that important perspective, the Stipulated ROE and capital structure strike the
10 necessary balance between customer and investor interests.

III. RESPONSE TO DR. WOOLRIDGE

11 **Q. PLEASE BRIEFLY SUMMARIZE DR. WOOLRIDGE'S ROE ANALYSES**
12 **AND RECOMMENDATIONS.**

13 A. Dr. Woolridge argues the Company's ROE is within a range of 7.90% to 8.95%,
14 and provides a specific recommendation of 8.84%, which is based on the upper end
15 of the range of results based on his constant-growth discounted cash flow (DCF)
16 model, and the lower end of Staff's ROE range.¹³

17 **Q. DO YOU HAVE A GENERAL COMMENT REGARDING DR.**
18 **WOOLRIDGE'S RECOMMENDATION?**

19 A. Yes, I do. As discussed above, Dr. Woolridge's recommended ROE of 8.84% is
20 disconnected from the Stipulated ROE and recent authorized ROEs. The reasons

¹³ Woolridge Direct Testimony, at 72.

1 why his recommendation is inadequate is because he fails to consider the increasing
2 risk inherent in current and expected capital market conditions and that he
3 exclusively relies on the DCF model, which does not accurately reflect the investor-
4 required return for stocks that have a market-to-book (M/B) ratio other than 1.0.

Capital Market Observations

5 **Q. PLEASE SUMMARIZE DR. WOOLRIDGE’S VIEWS ON CURRENT**
6 **MARKET CONDITIONS.**

7 A. Dr. Woolridge believes that the economy is in an inflationary period, and that the
8 Fed is using the tools at its disposal to bring inflation in line with its long-term
9 target of 2.00%.¹⁴ Regarding current and expected levels of inflation, Dr.
10 Woolridge calculates expected inflation rates using TIPS breakeven rates and
11 shows that while inflation is currently at or near 40-year highs, expected inflation
12 will moderate to approximately 2.50%.¹⁵ Dr. Woolridge also discusses utility stock
13 performance relative to the S&P 500 in 2022 and makes the conclusion that utility
14 stocks have fared better than the market over this period. Regarding interest rates,
15 Dr. Woolridge maintains that while current interest rates have risen since the onset
16 of the COVID-19 pandemic, they are still at historically low levels, and because of
17 that, the ROE allowed for the Company should be in line with recent returns
18 authorized for electric utilities.

¹⁴ Woolridge Direct Testimony, at 15.

¹⁵ Woolridge Direct Testimony, at 15-16.

1 **Q. PLEASE COMMENT ON DR. WOOLRIDGE’S OBSERVATIONS AND**
2 **CONCLUSIONS.**

3 A. I generally agree with Dr. Woolridge’s observations that the economy is in an
4 inflationary period, and that the Fed is using the tools at its disposal to reduce
5 inflation to its target of 2.00%, as discussed in my Supplemental Direct
6 Testimony.¹⁶ However, I do not agree with Dr. Woolridge’s contention that (1)
7 interest rates are at historical low levels and that investors will accept ROEs
8 consistent with the low interest rate period which accompanied the COVID-19
9 pandemic; (2) that an expected inflation rate of 2.50% is comparable to the Fed’s
10 target inflation rate of 2.00% and does not affect the investor-required return; and
11 (3) that the eight months of return data ended August 2022 signify as proof that
12 utility investments have performed better than the overall stock market.

13 **Q. ARE INTEREST RATES AT HISTORIC LOWS?**

14 A. No, they are not. While the period coinciding with the COVID-19 pandemic is
15 associated with historically low interest rates, present interest rates are at levels not
16 seen in approximately ten years. As shown on page 1 of Dr. Woolridge’s Exhibit
17 JRW-2, current A-rated public utility bond yields are at levels last seen in 2011,
18 and as shown on page 2 of Dr. Woolridge’s Exhibit JRW-8, 30-year Treasury bonds
19 are at levels last seen in 2018. The closing 30-year Treasury bond yield of 3.40%
20 on September 7, 2022 is similar to interest rates last seen in 2014.

¹⁶ D’Ascendis Supplemental Direct Testimony, at 4-11.

1 **Q. WHAT IS THE TREND IN INTEREST RATES?**

2 A. Interest rates are on an upward trend since the end of the COVID-19 pandemic. For
3 the eight months ending August 31, 2022, A-rated public utility bond yields
4 increased from 3.10% to 4.93%, or 59% and 30-year Treasury bonds increased from
5 1.90% to 3.27%, or 72%. Relative to the “historic lows” during the pandemic, A-
6 rated utility bond yields and 30-year Treasury bond yields increased 93% and
7 230%, respectively. Dr. Woolridge’s opinion that interest rates are at historically
8 low levels is not accurate.

9 **Q. GIVEN CURRENT A-RATED UTILITY BOND YIELDS AND 30-YEAR**
10 **TREASURY BOND YIELDS ARE COMPARABLE TO INTEREST RATE**
11 **LEVELS TO 2011 AND 2014, RESPECTIVELY, WHAT WERE THE**
12 **ASSOCIATED LEVELS OF AUTHORIZED ROES ALLOWED FOR**
13 **ELECTRIC UTILITIES DURING THOSE YEARS?**

14 A. On page 19 of his direct testimony, Dr. Woolridge presents Figure 5, which shows
15 authorized ROEs for electric and gas utilities since 2010. As shown on Dr.
16 Woolridge’s Figure 5, average authorized ROEs for electric utilities in 2011 and
17 2014 were approximately 10.30% and 9.80%, respectively. While I do not
18 recommend that the Commission use this data directly in its determination of the
19 ROE in this proceeding, it is a directional indicator that the ROE should be set at a
20 higher level than what has recently been approved and that the recommendation of
21 Dr. Woolridge is severely understated.

1 **Q. DOES AN INFLATION RATE OF 2.50% PRESENT INCREASED RISK TO**
2 **INVESTORS AS COMPARED TO THE FED’S TARGET INFLATION**
3 **RATE OF 2.00%**

4 A. Yes, it does. Please consider the following example. A dollar today would be
5 worth approximately \$0.55 in 2052 (30 years from now) in an environment with a
6 2.00% inflation rate and approximately \$0.48 in an environment with a 2.50%
7 inflation rate. The difference between the two values (approximately \$0.08)
8 represents a loss in value of approximately 14.00%. Therefore, an investor
9 experiencing an environment with 2.50% inflation would require a higher return
10 than an investor experiencing a 2.00% inflation rate as they need to compensate for
11 the effects of inflation in their portfolios.

12 **Q. DO YOU THINK RETURN DATA FOR UTILITY STOCKS AND MARKET**
13 **INDICES FOR THE EIGHT MONTHS ENDING AUGUST 2022 IS AN**
14 **ADEQUATE TIMEFRAME TO DETERMINE WHETHER UTILITY**
15 **STOCKS “HELD UP QUITE WELL”¹⁷?**

16 A. No, I do not. As shown on Attachment DWD-SS-2, for the timeframe
17 encompassing the COVID-19 pandemic to August 2022, utility stocks, as measured
18 by the combined utility proxy group, are more volatile and performed worse than
19 market indices such as the S&P 500. This combination (high volatility and low
20 returns) is not indicative of a defensive investment and should not be viewed as
21 such.

¹⁷ Woolridge Direct Testimony, at 17.

Sole Reliance on and Application of the Discounted Cash Flow Model

1 **Q. TO WHAT EXTENT DOES DR. WOOLRIDGE’S RECOMMENDED ROE**
2 **RELY ON HIS DCF MODEL?**

3 A. As previously stated, Dr. Woolridge relies exclusively on his constant growth DCF
4 model results to determine his recommended ROE. As discussed in my Direct
5 Testimony,¹⁸ the use of multiple models adds reliability to the estimation of the
6 common equity cost rate, with the prudence of using multiple cost of common
7 equity models supported in both the financial literature and regulatory precedent.

8 **Q. CAN YOU PLEASE PROVIDE SOME EXAMPLES FROM FINANCIAL**
9 **LITERATURE WHICH SUPPORT THE USE OF MULTIPLE COST OF**
10 **COMMON EQUITY MODELS IN DETERMINING THE INVESTOR-**
11 **REQUIRED RETURN?**

12 A. Yes. In one example, Morin states:

13 Each methodology requires the exercise of considerable judgment
14 on the reasonableness of the assumptions underlying the
15 methodology and on the reasonableness of the proxies used to
16 validate a theory. The inability of the DCF model to account for
17 changes in relative market valuation, discussed below, is a vivid
18 example of the potential shortcomings of the DCF model when
19 applied to a given company. Similarly, the inability of the CAPM
20 to account for variables that affect security returns other than beta
21 tarnishes its use.

22 No one individual method provides the necessary level of precision
23 for determining a fair return, but each method provides useful
24 evidence to facilitate the exercise of an informed judgment.
25 Reliance on any single method or preset formula is inappropriate
26 when dealing with investor expectations because of possible

¹⁸ D’Ascendis Direct Testimony, at 15.

1 measurement difficulties and vagaries in individual companies'
2 market data. (emphasis added)

3 * * *

4 There is ample academic support in the financial literature for the
5 need to rely upon several financial models in arriving at a
6 recommended common equity rate. Professor Eugene Brigham, a
7 widely respected scholar and finance academician, asserts<sup>(footnote
8 omitted)</sup>:

9 Three methods typically are used: (1) the Capital Asset Pricing
10 Model (CAPM), (2) the discounted cash flow (DCF) method, and
11 (3) the bond-yield-plus-risk-premium approach. **These methods
12 are not mutually exclusive – no method dominates the others,**
13 and all are subject to error when used in practice. Therefore, when
14 faced with the task of estimating a company's cost of equity, we
15 generally use all three methods and then choose among them on the
16 basis of our confidence in the data used for each in the specific case
17 at hand. (emphasis added)

18 Another prominent finance scholar, Professor Stewart Myers, in an
19 early pioneering article on regulatory finance, stated^(footnote omitted):

20 Use more than one model when you can. Because estimating the
21 opportunity cost of capital is difficult, **only a fool throws away
22 useful information.** That means you should not use any one model
23 or measure mechanically and exclusively. Beta is helpful as one
24 tool in a kit, to be used in parallel with DCF models or other
25 techniques for interpreting capital market data. (emphasis added)

26 * * *

27 Reliance on multiple tests recognizes that no single methodology
28 produces a precise definitive estimate of the cost of equity. As stated
29 in Bonbright, Danielsen, and Kamerschen (1988), '*no single or
30 group test or technique is conclusive.*' (italics in original)

31 * * *

32 While it is certainly appropriate to use the DCF methodology to
33 estimate the cost of equity, there is no proof that the DCF produces
34 a more accurate estimate of the cost of equity than other
35 methodologies. Sole reliance on the DCF model ignores the capital
36 market evidence and financial theory formalized in the CAPM and
37 other risk premium methods. **The DCF model is one of many tools**

1 **to be employed in conjunction with other methods to estimate**
2 **the cost of equity.** It is not a superior methodology that supplants
3 other financial theory and market evidence. The broad usage of the
4 DCF methodology in regulatory proceedings in contrast to its
5 relative obscurity in academic textbooks does not make it superior
6 to other methods. The same is true of the Risk Premium and CAPM
7 methodologies. (emphasis added)¹⁹

8 Finally, Brigham and Gapenski note:

9 In practical work, *it is often best to use all three methods – CAPM,*
10 bond yield plus risk premium, and DCF – and then apply judgment
11 when the methods produce different results. People experienced in
12 estimating equity capital costs recognize that both careful analysis
13 and some very fine judgments are required. It would be nice to
14 pretend that these judgments are unnecessary and to specify an easy,
15 precise way of determining the exact cost of equity capital.
16 Unfortunately, this is not possible. Finance is in large part a matter
17 of judgment, and we simply must face this fact. (italics in original)²⁰

18 In the academic literature cited above, three methods are consistently
19 mentioned: the DCF, CAPM, and the RPM, all of which I used in my analyses.

20 **Q. IN ADDITION TO THE ABOVE, WHY IS SOLE RELIANCE ON THE DCF**
21 **MODEL PROBLEMATIC AT THIS TIME?**

22 A. Traditional rate base/rate of return regulation, where a market-based common
23 equity cost rate is applied to a book value rate base, presumes that M/B ratios are
24 at unity or 1.00. However, that is rarely the case. Morin states:

25 The third and perhaps most important reason for caution and
26 skepticism is that application of the DCF model produces estimates
27 of common equity cost that are consistent with investors' expected
28 return only when stock price and book value are reasonably similar,
29 that is, when the market-to-book ratio M/B is close to unity. As
30 shown below, application of the standard DCF model to utility
31 stocks understates the investor's expected return when the M/B ratio
32 of a given stock exceeds unity. This is particularly relevant in the

¹⁹Roger A. Morin, Modern Regulatory Finance, (Public Utility Reports, Inc. 2021), at 476 – 480. (“Morin”)

²⁰Eugene F. Brigham and Louis C. Gapenski, Financial Management – Theory and Practice, 4th Ed. (The Dryden Press, 1985) at 256.

1 capital market environment of the early 2020s when utility stocks
2 are trading at M/B ratios well above unity and have been for nearly
3 several decades. The converse is also true, that is, the DCF model
4 overstates the investor's return when the stock's M/B ratio is less
5 than unity. The reason for the distortion is that the DCF market
6 return is applied to a book value rate base by the regulator, that is, a
7 utility's earnings are limited to earnings on a book value rate base.²¹

8 As he explains, DCF models assume an M/B ratio of 1.0 and therefore
9 under- or over-states investors' required return when market value exceeds or is
10 less than book value, respectively. It does so because equity investors evaluate and
11 receive their returns on the market value of a utility's common equity, whereas
12 regulators authorize returns on the book value of common equity. This means that
13 the market-based DCF will produce the total annual dollar return expected by
14 investors only when market and book values of common equity are equal, a very
15 rare and unlikely situation.

16 **Q. WHY DO MARKET AND BOOK VALUES DIVERGE?**

17 A. Market values can diverge from book values for a myriad of reasons including, but
18 not limited to, earnings per share and dividends per share expectations,
19 merger/acquisition expectations, interest rates, etc. As noted by Phillips:

20 Many question the assumption that market price should equal book
21 value, believing that 'the earnings of utilities should be sufficiently
22 high to achieve market-to-book ratios which are consistent with
23 those prevailing for stocks of unregulated companies.'²²

24 In addition, Bonbright states:

25 In the first place, commissions cannot forecast, except within wide
26 limits, the effect their rate orders will have on the market prices of
27 the stocks of the companies they regulate. In the second place,

²¹ Morin, at 481-482.

²² Charles F. Phillips, The Regulation of Public Utilities, Public Utilities Reports, Inc., 1993, at 395.

1 *whatever the initial market prices may be, they are sure to change*
2 *not only with the changing prospects for earnings, but with the*
3 *changing outlook of an inherently volatile stock market. In short,*
4 *market prices are beyond the control, though not beyond the*
5 *influence of rate regulation. Moreover, even if a commission did*
6 *possess the power of control, any attempt to exercise it ... would*
7 *result in harmful, uneconomic shifts in public utility rate levels.*
8 (italics added)²³

9 **Q. CAN THE UNDER- OR OVER-STATEMENT OF INVESTORS'**
10 **REQUIRED RETURN BY THE DCF MODEL BE DEMONSTRATED**
11 **MATHEMATICALLY?**

12 A. Yes. Attachment DWD-SS-3 demonstrates how a market-based DCF cost rate of
13 8.90%, when applied to a book value substantially below market value, will
14 understate investors' required return on market value. As shown, there is no
15 realistic opportunity to earn the expected market-based rate of return on book value.
16 In Column [A], investors expect a 8.90% return on an average market price of
17 \$76.23 for Dr. Woolridge's proxy group. Column [B] shows that when Dr.
18 Woolridge's 8.90% return rate is applied to a book value of \$35.73,²⁴ the total
19 annual return opportunity is \$3.18. After subtracting dividends of \$2.52, the
20 investor only has the opportunity for \$0.66 in market appreciation, or 0.87%. The
21 magnitude of the understatement of investors' required return on market value
22 using Dr. Woolridge's 8.90% cost rate is 4.73%, which is calculated by subtracting
23 the market appreciation based on book value of 0.87% from Dr. Woolridge's
24 expected growth rate of 5.60%.

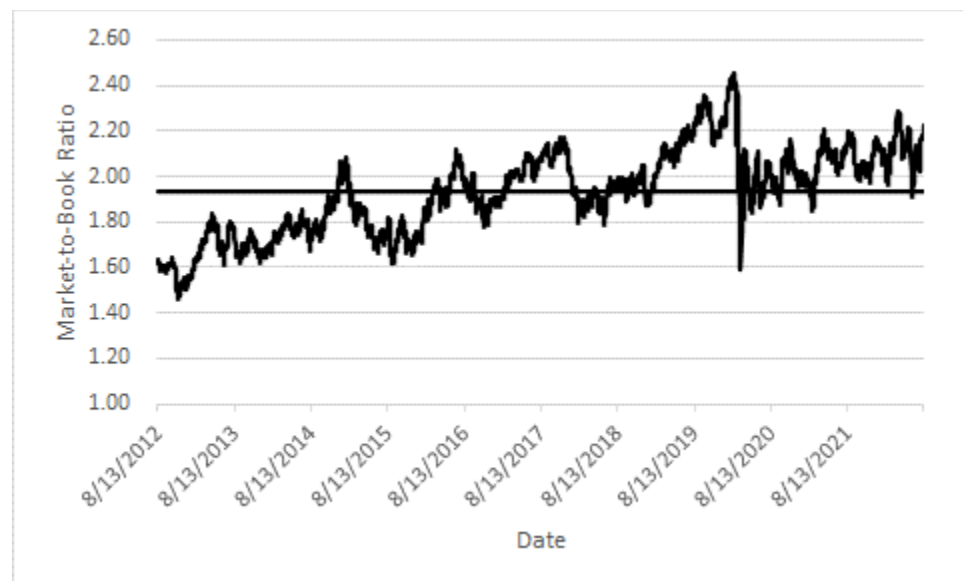
²³ James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates (Public Utilities Reports, Inc., 1988), at 334.

²⁴ Representing a market-to-book ratio of 213.32%.

1 **Q. HOW DO M/B RATIOS OF DR. WOOLRIDGE’S PROXY GROUP**
2 **COMPARE TO THEIR TEN-YEAR AVERAGE?**

3 A. The M/B ratio of Dr. Woolridge’s proxy group is currently close to its ten-year
4 average. As shown in Chart 1, below, with the exception of early 2020, since early
5 2016, the M/B ratios of the Dr. Woolridge’s proxy group have exceeded its ten-
6 year average M/B ratio of approximately 1.93 times.

**Chart 1: M/B Ratios of Dr. Woolridge’s Electric Proxy Group Compared
with Ten-Year Average²⁵**



7 The significance of this is that the ten-year average M/B ratio has always been
8 higher than 1.0x, which means that DCF model results have consistently
9 understated the investor-required return.

²⁵ Source: S&P Global Market Intelligence.

1 **Q. IS THERE ANOTHER WAY TO QUANTIFY THE INACCURACY OF THE**
2 **DCF MODEL WHEN M/B RATIOS ARE DIFFERENT THAN UNITY?**

3 A. Yes. One can quantify the inaccuracy of the DCF model when M/B ratios are not
4 at unity by estimating the implied DCF model results (based on a market-value
5 capital structure) to reflect a book-value capital structure. This can be measured by
6 first calculating the market value of each proxy company's capital structure, which
7 consists of the market value of the company's common equity (shares outstanding
8 multiplied by price) and the fair value of the company's long-term debt and
9 preferred stock. All of these measures, except for price, are available in each
10 company's SEC Form 10-K.

11 Second, one must de-leverage the implied cost of common equity based on
12 the DCF. This is derived using the Modigliani / Miller equation²⁶ as illustrated in
13 Attachment DWD-SS-4 and shown below:

14
$$k_u = k_e - (((k_u - i)(1 - t)) D/E) - (k_u - d) P/E \text{ [Equation 1]}$$

15 Where:

16 k_u = Unlevered (i.e., 100% equity) cost of common equity;
17 k_e = Market determined cost of common equity;
18 i = Cost of debt;
19 t = Income tax rate;
20 D = Debt ratio;
21 E = Equity ratio;
22 d = Cost of preferred stock; and
23 P = Preferred equity ratio.

²⁶ The Modigliani / Miller theorem is an influential element of economic theory and forms the basis for modern theory on capital structure. See, F. Modigliani, and M. Miller, *The Cost of Capital, Corporation Finance and the Theory of Investment*, The American Economic Review, Vol. 48, No. 3, (June 1958), at 261-297.

For example, using Dr. Woolridge's average proxy group-specific data, the equation becomes:

$$k_u = 8.90\% - (((k_u - 3.80\%)(1 - 21\%)) 41.30\% / 58.31\%) - (k_u - 4.78\%) 0.39\% / 58.31\%$$

Solving for k_u results in an unlevered cost of common equity of 7.06%.

Next, one must re-lever those costs of common equity by relating them to each proxy group's average book capital structure as shown below:

$$k_e = k_u + (((k_u - i)(1 - t)) D/E) + (k_u - d) P/E \text{ [Equation 2]}$$

Once again, using Dr. Woolridge's average proxy group-specific data, the equation becomes:

$$k_e = 7.06\% + (((7.06\% - 3.80\%)(1 - 21\%)) 57.04\% / 42.38\%) + (7.06\% - 4.78\%) 0.58\% / 42.38\%$$

Solving for k_e results in a 10.56% indicated cost of common equity relative to the book capital structure of the proxy group, which is an increase of 1.66% over Dr. Woolridge's indicated DCF result of 8.90%.

Q. ARE YOU ADVOCATING A SPECIFIC ADJUSTMENT TO THE DCF RESULTS TO CORRECT FOR ITS MIS-SPECIFICATION OF THE INVESTOR-REQUIRED RETURN?

A. No. The purpose of this discussion was to demonstrate that like all cost of common equity models, the DCF has its limitations, and that the use of multiple cost of common equity models, in conjunction with informed expert judgment, provides a more accurate and reliable picture of the investor-required ROE than does a narrow evaluation of the results of one model.

IV . CONCLUSION

1 **Q. IN YOUR VIEW, IS THE STIPULATED ROE, RATE OF RETURN, AND**
2 **CAPITAL STRUCTURE A REASONABLE RESOLUTION TO AN**
3 **OTHERWISE CONTENTIOUS ISSUE?**

4 A. Yes, it is.

5 **Q. DO YOU BELIEVE THE STIPULATED ROE, RATE OF RETURN, AND**
6 **CAPITAL STRUCTURE WERE THE PRODUCT OF SERIOUS**
7 **BARGAINING AND DO NOT VIOLATE ANY IMPORTANT**
8 **REGULATORY PRACTICES OR PRINCIPLES?**

9 A. Yes. As I explained above, the Stipulated ROE, and Capital Structure and resulting
10 Rate of Return are lower than what was recommended by me in these proceedings,
11 but remain within the range of my analysis, albeit the lower end. The resulting ROE
12 and Rate of Return are consistent with similarly situated electric distribution
13 utilities and the agreed upon components are in line with recent regulatory decisions
14 across the Country. Empirical analysis supports the end result reached in the
15 Stipulation, and therefore I believe no important regulatory principles or practices
16 are violated.

17 **Q SHOULD THE COMMISSION ADOPT DR. WOOLRIDGE'S**
18 **RECOMMENDED ROE AND CAPITAL STRUCTURE IN LIEU OF**
19 **APPROVING THE STIPULATION?**

20 A. No, they should not. Dr. Woolridge's recommendation is inadequate based on his
21 exclusive reliance on the DCF model and is incompatible with both recent
22 authorized ROEs and current and expected market conditions.

1 **Q. DOES THIS CONCLUDE YOUR SECOND SUPPLEMENTAL**
2 **TESTIMONY?**

3 **A. Yes, it does.**

Duke Energy Ohio, Inc.

Recently Authorized ROEs by RRA Ranking

State	Company	Case Identification	Service	Case Type	Date	Return on Equity (%)	Common Equity to Total Capital (%)	RRA Rank	Electric Utilities		
									Top Third (Average/1 and higher)	Middle Third (Average/2)	Bottom Third (Average/3 and lower)
Kentucky	Kentucky Power Co.	C-2017-00179	Electric	Vertically Integrated	1/18/2018	9.70	41.68	Average / 1	9.70		
Oklahoma	Public Service Co. of OK	Ca-PUD2017000151	Electric	Vertically Integrated	1/31/2018	9.30	48.51	Average / 3			9.30
Iowa	Interstate Power & Light Co.	D-RPU-2017-0001	Electric	Vertically Integrated	2/2/2018	9.98	49.02	Average / 1	9.98		
North Carolina	Duke Energy Progress LLC	D-E-2, Sub 1142	Electric	Vertically Integrated	2/23/2018	9.90	52.00	Average / 1	9.90	9.25	
Minnesota	Minnesota Power Entprps Inc.	D-E-015/GR-16-664	Electric	Vertically Integrated	3/15/2018	9.25	53.81	Average / 2			
New York	C-17-E-0238		Electric	Distribution	3/15/2018	9.00	48.00	Average / 1	9.00		
Michigan	Niagara Mohawk Power Corp.	C-U-18322	Electric	Vertically Integrated	3/29/2018	10.00	48.89	Above Average / 3	10.00		
Michigan	Consumers Energy Co.	C-U-18370	Electric	Vertically Integrated	4/12/2018	9.90	36.38	Above Average / 3	9.90		
Indiana	Indiana Michigan Power Co.	C-2017-00321	Electric	Vertically Integrated	4/13/2018	9.73	49.25	Average / 1	9.73		
Connecticut	Duke Energy Kentucky Inc.	D-17-10-46	Electric	Distribution	4/18/2018	9.25	53.00	Average / 2			9.25
Michigan	The CT Light & Power Co.	C-U-18255	Electric	Vertically Integrated	4/18/2018	10.00	36.84	Above Average / 3	10.00		
Washington	DTE Electric Co.	D-UE-170485	Electric	Vertically Integrated	4/26/2018	9.50	48.50	Average / 3			9.50
Indiana	Avista Corp.	Ca-44967	Electric	Vertically Integrated	5/30/2018	9.95	35.73	Average / 1	9.95		
Indiana	Indiana Michigan Power Co.	C-9472	Electric	Distribution	5/31/2018	9.50	50.44	Below Average / 3			9.50
Maryland	Potomac Electric Power Co.	D-17-E-0459	Electric	Distribution	6/14/2018	8.80	48.00	Average / 1		9.50	
New York	Central Hudson Gas & Electric	D-2016-0328	Electric	Vertically Integrated	6/22/2018	9.50	57.10	Average / 2	9.50		
Hawaii	Hawaiian Electric Co.	D-E-7, Sub 1146	Electric	Vertically Integrated	6/22/2018	9.90	52.00	Average / 1			
North Carolina	Duke Energy Carolinas LLC	D-2017-00198	Electric	Distribution	6/28/2018	9.35	49.00	Average / 2	9.35		
Maine	Versant Power	D-2015-0170	Electric	Vertically Integrated	6/29/2018	9.50	56.69	Average / 2	9.50		
District of Columbia	Potomac Electric Power Co.	FC-1150	Electric	Distribution	8/8/2018	9.53	50.44	Below Average / 3			9.53
Delaware	Delmarva Power & Light Co.	D-17-0977	Electric	Distribution	8/21/2018	9.70	50.52	Average / 3		9.28	
Rhode Island	Narragansett Electric Co.	D-4770 (electric)	Electric	Distribution	8/24/2018	9.28	50.95	Average / 2			9.56
New Mexico	Southwestern Public Service Co	D-17-00255-UT	Electric	Vertically Integrated	9/5/2018	9.56	53.97	Below Average / 2			
Wisconsin	Wisconsin Power and Light Co	D-6680-UR-121 (Elec)	Electric	Vertically Integrated	9/14/2018	10.00	52.00	Above Average / 2	10.00		
Wisconsin	Madison Gas and Electric Co.	D-3270-UR-122 (Elec)	Electric	Vertically Integrated	9/20/2018	9.80	56.06	Above Average / 2			
Ohio	The Dayton Power & Light Co.	C-15-1830-EL-AIR	Electric	Distribution	9/26/2018	10.00	47.52	Average / 2	9.80	10.00	
North Dakota	Oter Tail Power Co.	C-PU-17-398	Electric	Distribution	9/26/2018	9.77	52.50	Average / 1	9.77		
Kansas	Energy Kansas Central Inc.	D-18-WSEE-328-RTS	Electric	Vertically Integrated	9/27/2018	9.30	51.24	Below Average / 1			9.30
New Jersey	UGI Utilities Inc.	D-R-2017-2640058	Electric	Distribution	10/4/2018	9.85	54.02	Above Average / 3	9.85		
Indiana	D-ER18010029		Electric	Distribution	10/29/2018	9.60	54.00	Below Average / 1			9.60
Kansas	Ca-45029		Electric	Vertically Integrated	10/31/2018	9.99	39.67	Average / 1	9.99		
Kansas	AES Indiana	D-18-KCPE-480-RTS	Electric	Vertically Integrated	12/13/2018	9.30	49.09	Below Average / 1			9.30
Oregon	Energy Metro Inc	D-UE-335	Electric	Vertically Integrated	12/13/2018	9.50	50.00	Average / 2	9.50		
Ohio	Portland General Electric Co.	C-17-0032-EL-AIR	Electric	Distribution	12/14/2018	9.84	50.75	Average / 2		9.84	
Texas	Duke Energy Ohio Inc.	D-48401	Electric	Distribution	12/20/2018	9.65	45.00	Average / 3			9.65
Michigan	Consumers Energy Co.	C-U-20134	Electric	Vertically Integrated	1/9/2019	10.00	NA	Above Average / 3	10.00		
West Virginia	Appalachian Power Co.	C-18-0646-E-42T	Electric	Vertically Integrated	2/27/2019	9.75	50.16	Below Average / 2			9.75
New Jersey	Atlantic City Electric Co.	D-ER18080925	Electric	Distribution	3/13/2019	9.60	49.94	Below Average / 1			9.60
New York	Orange & Rockland Utits Inc.	C-18-E-0067	Electric	Distribution	3/14/2019	9.00	48.00	Average / 1	9.00		
Oklahoma	Public Service Co. of OK	Ca-PUD201800097	Electric	Vertically Integrated	3/14/2019	9.40	NA	Average / 3			9.40
Maryland	The Potomac Edison Co.	C-9490	Electric	Distribution	3/22/2019	9.65	52.82	Below Average / 3			9.65
Kentucky	Kentucky Utilities Co.	C-2018-00294	Electric	Vertically Integrated	4/30/2019	9.73	NA	Average / 1	9.73		
Kentucky	Louisville Gas & Electric Co.	C-2018-00295 (elec)	Electric	Vertically Integrated	4/30/2019	9.73	NA	Average / 1	9.73		
South Carolina	D-2018-319-E		Electric	Vertically Integrated	5/1/2019	9.50	53.00	Average / 3			9.50
Michigan	DTE Electric Co.	C-U-20162	Electric	Vertically Integrated	5/2/2019	10.00	37.94	Above Average / 3	10.00		
South Carolina	Duke Energy Progress LLC	D-2018-318-E	Electric	Vertically Integrated	5/8/2019	9.50	53.00	Average / 3			9.50
South Dakota	Oter Tail Power Co.	D-EL18-021	Electric	Vertically Integrated	5/8/2019	8.75	52.92	Average / 2		8.75	
Hawaii	Mau Electric Company Ltd	D-2017-0150	Electric	Vertically Integrated	5/16/2019	9.50	57.02	Average / 2		9.50	
Michigan	Upper Peninsula Power Co.	C-U-20276	Electric	Vertically Integrated	5/23/2019	9.90	NA	Above Average / 3	9.90		
Michigan	Potomac Electric Power Co.	C-9602	Electric	Distribution	8/12/2019	9.60	50.46	Below Average / 3			9.60
Wisconsin	Northern States Power Co.	D-4220-UR-124 (Elec)	Electric	Vertically Integrated	9/4/2019	10.00	52.52	Above Average / 2	10.00		
Massachusetts	Massachusetts Electric Co.	DPU-18-150	Electric	Distribution	9/30/2019	9.60	53.49	Average / 2		9.60	
Wisconsin	Wisconsin Electric Power Co.	D-05-UR-109 (WEP-Elec)	Electric	Vertically Integrated	10/31/2019	10.00	54.46	Above Average / 2	10.00		
Wisconsin	Wisconsin Public Service Corp.	D-6690-UR-126 (Elec)	Electric	Vertically Integrated	10/31/2019	10.00	51.96	Above Average / 2	10.00		
Louisiana	Entergy New Orleans LLC	C-AVL-18-07 (elec)	Electric	Vertically Integrated	11/7/2019	9.35	50.00	Average / 2	10.00		
Idaho	Avista Corp.	D-2018-318-E	Electric	Vertically Integrated	11/29/2019	9.50	50.00	Average / 2		9.35	
Indiana	Northern In Public Svc Co.	Ca-45159	Electric	Vertically Integrated	12/4/2019	9.75	47.86	Average / 1	9.75		
Maryland	Baltimore Gas and Electric Co.	C-9610 (EL)	Electric	Distribution	12/17/2019	9.70	NA	Below Average / 2			9.70
Georgia	Georgia Power Co.	D-42516	Electric	Vertically Integrated	12/17/2019	10.50	56.00	Above Average / 2	10.50		
California	San Diego Gas & Electric Co.	A-19-04-017 (Elec)	Electric	Vertically Integrated	12/19/2019	10.20	52.00	Average / 2		10.20	
California	Pacific Gas and Electric Co.	A-19-04-015	Electric	Vertically Integrated	12/19/2019	10.25	52.00	Average / 2		10.25	
California	Southern California Edison Co.	A-19-04-014	Electric	Vertically Integrated	12/19/2019	10.30	52.00	Average / 2		10.30	

Duke Energy Ohio, Inc.

Recently Authorized ROEs by RRA Ranking

Electric Utilities											
State	Company	Case Identification	Service	Case Type	Date	Return on Equity (%)	Common Equity to Total Capital (%)	RRA Rank	Top Third (Average/1 and higher)	Middle Third (Average/2)	Bottom Third (Average/3 and lower)
Arkansas	Southwestern Electric Power Co	D-19-008-U	Electric	Vertically Integrated	12/20/2019	9.45	33.71	Average / 1	9.45		
Montana	NorthWestern Corp.	D2018.2.12	Electric	Vertically Integrated	12/20/2019	9.65	49.38	Below Average / 1			9.65
Nevada	Sierra Pacific Power Co.	D-19-06002	Electric	Vertically Integrated	12/24/2019	9.70	50.92	Average / 2	9.70		
Iowa	Interstate Power & Light Co.	D-RPU-2019-0001	Electric	Vertically Integrated	1/8/2020	10.02	51.00	Average / 1	10.02		
New York	Consolidated Edison Co. of NY	C-19-E-0065	Electric	Distribution	1/16/2020	8.80	48.00	Average / 1	8.80		9.50
New Jersey	Rockland Electric Company	D-ER19050552	Electric	Distribution	1/22/2020	9.50	48.32	Below Average / 1	9.86		
Michigan	Indiana Michigan Power Co.	C-U-20359	Electric	Vertically Integrated	1/23/2020	9.86	46.56	Above Average / 3			
California	PacificCorp	A-18-04-002	Electric	Vertically Integrated	2/6/2020	10.00	51.96	Average / 2		10.00	
Colorado	Public Service Co. of CO	D-19AL-0268E	Electric	Vertically Integrated	2/11/2020	9.30	55.61	Average / 2	9.30		
Texas	CenterPoint Energy Houston	D-49421	Electric	Distribution	2/14/2020	9.40	42.50	Average / 2	9.40		
Maine	Central Maine Power Co.	D-2018-00194	Electric	Distribution	2/19/2020	8.25	50.00	Average / 2		8.25	
North Carolina	Virginia Electric & Power Co.	E-22, Sub 562	Electric	Vertically Integrated	2/24/2020	9.75	52.00	Average / 1	9.75		
Texas	APX Texas Inc.	D-49494	Electric	Distribution	2/27/2020	9.40	42.50	Average / 2		9.40	
Indiana	Indiana Michigan Power Co.	Ca-45235	Electric	Vertically Integrated	3/11/2020	9.70	37.55	Average / 1	9.70		9.40
Washington	Avista Corp.	D-UE-190334	Electric	Vertically Integrated	3/25/2020	9.40	48.50	Average / 3		9.70	
Massachusetts	Fitchburg Gas & Electric Light	DPU 19-130	Electric	Distribution	4/17/2020	9.70	52.45	Average / 2			
Kentucky	Duke Energy Kentucky Inc.	C-2019-00271	Electric	Vertically Integrated	4/27/2020	9.25	48.23	Average / 1	9.25		
Michigan	DTE Electric Co.	C-U-20561	Electric	Vertically Integrated	5/8/2020	9.90	38.32	Above Average / 3	9.90		
New Mexico	Southwestern Public Service Co	C-19-00170-UT	Electric	Vertically Integrated	5/20/2020	9.45	54.77	Below Average / 2			9.45
Indiana	Duke Energy Indiana, LLC	Ca-45253	Electric	Vertically Integrated	6/29/2020	9.70	40.98	Average / 1	9.70		
New Hampshire	Liberty Utilities Granite St	D-DE-19-064	Electric	Distribution	6/30/2020	9.10	52.00	Average / 3			9.10
Missouri	Empire District Electric Co.	C-ER-2019-0374	Electric	Vertically Integrated	7/1/2020	9.25	46.00	Average / 3			9.25
Washington	Puget Sound Energy Inc.	D-UE-190529	Electric	Vertically Integrated	7/8/2020	9.40	48.50	Average / 3			9.40
Maryland	Delmarva Power & Light Co.	C-9630	Electric	Distribution	7/14/2020	9.60	50.53	Below Average / 2			9.60
Hawaii	Hawaii Electric Light Co.	D-2018-0368	Electric	Vertically Integrated	7/28/2020	9.50	56.83	Average / 2		9.50	
Texas	Southwestern Public Service Co	D-49831	Electric	Vertically Integrated	8/27/2020	9.45	54.62	Average / 2		9.45	
California	Liberty Utilities (CalPeco Ele	A-18-12-001	Electric	Vertically Integrated	8/27/2020	10.00	52.50	Average / 2		10.00	
Hawaii	Hawaiian Electric Co.	D-2019-0085	Electric	Vertically Integrated	10/22/2020	9.50	56.83	Average / 2		9.50	
New Jersey	Jersey Cntrl Power & Light Co.	D-ER20020146	Electric	Distribution	10/28/2020	9.60	51.44	Below Average / 1			9.60
New York	NY State Electric & Gas Corp.	C-19-E-0378	Electric	Distribution	11/19/2020	8.80	48.00	Average / 1	8.80		
New York	Rochester Gas & Electric Co	C-19-E-0380	Electric	Distribution	11/19/2020	8.80	48.00	Average / 1	8.80		
Virginia	Appalachian Power Co.	C-PUR-2020-00015	Electric	Vertically Integrated	11/24/2020	9.20	NA	Average / 1	9.20		
Wisconsin	Madison Gas and Electric Co.	D-3270-UR-123 (Elec)	Electric	Vertically Integrated	11/24/2020	9.80	55.00	Above Average / 2	9.80		
Nevada	Nevada Power Co.	D-20-06003	Electric	Vertically Integrated	12/10/2020	9.40	NA	Average / 2		9.40	
Washington	PacificCorp	D-UE-191024	Electric	Vertically Integrated	12/14/2020	9.50	49.10	Average / 3			9.50
New Hampshire	Public Service Co. of NH	D-DE-19-057	Electric	Distribution	12/15/2020	9.30	54.40	Average / 3			9.30
Maryland	Baltimore Gas and Electric Co.	C-9645 (EL)	Electric	Distribution	12/16/2020	9.50	52.00	Below Average / 2			9.50
Michigan	Consumers Energy Co.	C-U-20697	Electric	Vertically Integrated	12/17/2020	9.90	NA	Above Average / 3	9.90		
Oregon	PacificCorp	D-UE-374	Electric	Vertically Integrated	12/18/2020	9.50	50.00	Average / 2		9.50	
Arizona	Tucson Electric Power Co.	D-E-01933A-19-0028	Electric	Vertically Integrated	12/22/2020	9.15	53.08	Below Average / 3			9.15
Wisconsin	D-6680-UR-122 (Elec)	D-6680-UR-122 (Elec)	Electric	Vertically Integrated	12/23/2020	10.00	52.53	Above Average / 2	10.00		
Utah	PacificCorp	D-20-035-04	Electric	Vertically Integrated	12/30/2020	9.65	52.50	Average / 2		9.65	
Kentucky	Duke Energy Carolinas LLC	C-2020-00174	Electric	Vertically Integrated	1/13/2021	9.30	43.25	Average / 1	9.30		
North Carolina	Duke Energy Carolinas LLC	D-E-7, Sub 1214	Electric	Vertically Integrated	3/31/2021	9.60	52.00	Average / 1	9.60		
North Carolina	Duke Energy Progress LLC	D-E-2, Sub 1219	Electric	Vertically Integrated	4/16/2021	9.60	52.00	Average / 1	9.60		
Florida	Duke Energy Florida LLC	D-20210016-EI	Electric	Vertically Integrated	5/4/2021	9.85	44.84	Above Average / 2	9.85		
Wyoming	PacificCorp	D-20000-578-ER-20	Electric	Vertically Integrated	5/18/2021	9.50	51.00	Average / 2		9.50	
District of Columbia	Potomac Electric Power Co.	FC-1156	Electric	Distribution	6/4/2021	9.28	50.68	Below Average / 3			9.28
New Mexico	El Paso Electric Co.	C-20-00104-UT	Electric	Vertically Integrated	6/23/2021	9.00	49.21	Below Average / 2			9.00
Maryland	Potomac Electric Power Co.	C-9655	Electric	Distribution	6/28/2021	9.55	50.50	Average / 3			9.55
Kentucky	Kentucky Utilities Co.	C-2020-00349	Electric	Vertically Integrated	6/30/2021	9.43	NA	Average / 1	9.43		
Kentucky	Louisville Gas & Electric Co.	C-2020-00350 (elec)	Electric	Vertically Integrated	6/30/2021	9.43	NA	Average / 1	9.43		
New Jersey	Atlantic City Electric Co.	D-ER20120746	Electric	Distribution	7/14/2021	9.60	50.21	Below Average / 1			9.60
South Carolina	Dominion Energy South Carolina	D-2020-125-E	Electric	Vertically Integrated	7/21/2021	9.50	51.62	Average / 3			9.50
Delaware	Delmarva Power & Light Co.	D-20-0149	Electric	Distribution	8/5/2021	9.60	NA	Average / 3			9.60
North Dakota	Northern States Power Co.	C-PU-20-441	Electric	Vertically Integrated	8/18/2021	9.50	52.50	Average / 1	9.50		
Idaho	Avista Corp.	C-AVU-E-21-01	Electric	Vertically Integrated	9/11/2021	9.40	50.00	Average / 2		9.40	
Washington	Avista Corp.	D-UE-200900	Electric	Vertically Integrated	9/27/2021	9.40	48.50	Average / 3	9.95		9.40
Florida	Tampa Electric Co.	D-20210034-EI	Electric	Vertically Integrated	10/21/2021	9.95	45.07	Above Average / 2	9.95		
Florida	Florida Power & Light Co.	D-20210015-EI	Electric	Vertically Integrated	10/26/2021	10.60	NA	Above Average / 2	10.60		
Maine	Versant Power	D-2020-00316	Electric	Distribution	10/28/2021	9.35	49.00	Average / 3			9.35
Arizona	Arizona Public Service Co.	D-E-01345A-19-0236	Electric	Vertically Integrated	11/2/2021	8.70	54.67	Below Average / 2			8.70

Duke Energy Ohio, Inc.

Recently Authorized ROEs by RRA Ranking

Electric Utilities											
State	Company	Case Identification	Service	Case Type	Date	Return on Equity (%)	Common Equity to Total Capital (%)	RRA Rank	Top Third (Average/1 and higher)	Middle Third (Average/2)	Bottom Third (Average/3 and lower)
Minnesota	Otter Tail Power Co.	D-E-017/GR-20-719	Electric	Vertically Integrated	11/4/2021	9.48	52.50	Average / 2		9.48	
Ohio	Ohio Power Co.	C-20-0585-EL-AIR	Electric	Distribution	11/17/2021	9.70	54.43	Average / 3			9.70
New York	Central Hudson Gas & Electric	C-20-E-0428	Electric	Distribution	11/18/2021	9.00	50.00	Average / 2		9.00	
Texas	Southwestern Electric Power Co	D-51415	Electric	Vertically Integrated	11/18/2021	9.25	49.37	Average / 3			9.25
Virginia	Virginia Electric & Power Co.	C-PUR-2021-00058	Electric	Vertically Integrated	11/18/2021	9.35	51.92	Average / 1	9.35		
Wisconsin	Northern States Power Co.	D-4220-UR-125 (Elec)	Electric	Vertically Integrated	11/18/2021	10.00	52.50	Above Average / 2	10.00		
Wisconsin	Wisconsin Power and Light Co	D-6680-UR-123 (Elec)	Electric	Vertically Integrated	11/18/2021	10.00	52.50	Above Average / 2	10.00		
Wisconsin	Madison Gas and Electric Co.	D-3270-UR-124 (Elec)	Electric	Vertically Integrated	11/23/2021	9.80	55.00	Above Average / 2	9.80		
Arkansas	Entergy Arkansas LLC	D-16-036-FR (2021 review)	Electric	Vertically Integrated	12/7/2021	9.65	37.75	Average / 1	9.65		
New Jersey	Rockland Electric Company	D-ER21050823	Electric	Distribution	12/15/2021	9.60	48.51	Below Average / 1			9.60
Michigan	Consumers Energy Co.	C-U-20963	Electric	Vertically Integrated	12/22/2021	9.90	41.84	Above Average / 3	9.90		
Oklahoma	Public Service Co. of OK	Ca-PUD202100055	Electric	Vertically Integrated	12/28/2021	9.40	NA	Average / 2	9.40		
New York	Niagara Mohawk Power Corp.	C-20-E-0380	Electric	Distribution	1/20/2022	9.00	48.00	Average / 2		9.00	
New Mexico	Southwestern Public Service Co	C-20-00238-UT	Electric	Vertically Integrated	2/16/2022	9.35	54.72	Below Average / 2			9.35
Indiana	Indiana Michigan Power Co.	Ca-45576	Electric	Vertically Integrated	2/23/2022	9.70	40.70	Average / 1	9.70		
Colorado	Public Service Co. of CO	D-21AL-0317E	Electric	Vertically Integrated	3/16/2022	9.30	55.69	Average / 1	9.30		
New York	Orange & Rockland Utls Inc.	C-21-E-0074	Electric	Distribution	4/14/2022	9.20	48.00	Average / 2		9.20	
Oregon	Portland General Electric Co.	D-UE-394	Electric	Vertically Integrated	4/25/2022	9.50	50.00	Average / 2	9.50		
New Hampshire	Unitil Energy Systems Inc.	D-DE-21-030	Electric	Distribution	5/12/2022	9.20	52.00	Average / 2		9.20	
Arkansas	Southwestern Electric Power Co	D-21-070-U	Electric	Vertically Integrated	5/23/2022	9.50	44.54	Average / 1	9.50		
Total Cases						144			60	39	45
Mean						9.57			9.70	9.49	9.45
Median						9.54			9.80	9.50	9.50
Maximum						10.60			10.60	10.30	9.75
Minimum						8.25			8.80	8.25	8.70

Source: Regulatory Research Associates

Duke Energy Ohio, Inc.

Recently Authorized ROEs by RRA Ranking

State	Company	Case Identification	Service	Case Type	Date	Return on Equity (%)	Common Total Capital (%)	RRA Rank	Electric Utilities		
									Top Third (Average/1 and higher)	Middle Third (Average/2)	Bottom Third (Average/3 and lower)
Kentucky	Kentucky Power Co.	C-2017-00179	Electric	Vertically Integrated	1/18/2018	9.70	41.68	Average / 1	41.68		
Oklahoma	Public Service Co. of OK	Ca-PUD201700151	Electric	Vertically Integrated	1/31/2018	9.30	48.51	Average / 3			48.51
Iowa	Interstate Power & Light Co.	D-RPU-2017-0001	Electric	Vertically Integrated	2/2/2018	9.98	49.02	Average / 1	49.02		
North Carolina	Duke Energy Progress LLC	D-E-2, Sub 1142	Electric	Vertically Integrated	3/23/2018	9.90	52.00	Average / 1	52.00		
Minnesota	Minnesota Power Entprps Inc.	D-E-015/GR-16-664	Electric	Vertically Integrated	2/12/2018	9.25	53.81	Average / 2		53.81	
New York	Niagara Mohawk Power Corp.	C-17-E-0238	Electric	Distribution	3/15/2018	9.00	48.00	Average / 1	48.00		
Michigan	Consumers Energy Co.	C-U-18322	Electric	Vertically Integrated	3/29/2018	10.00	40.89	Above Average / 3			
Michigan	Indiana Michigan Power Co.	C-U-18370	Electric	Vertically Integrated	4/12/2018	9.90	36.38	Above Average / 3			
Kentucky	Duke Energy Kentucky Inc.	C-2017-00321	Electric	Vertically Integrated	4/13/2018	9.73	49.25	Average / 1	49.25		
Connecticut	The CT Light & Power Co	D-17-10-46	Electric	Distribution	4/18/2018	9.25	53.00	Below Average / 2			53.00
Michigan	DTE Electric Co.	C-U-18255	Electric	Vertically Integrated	4/18/2018	10.00	36.84	Above Average / 3			
Washington	Avista Corp.	D-UE-170485	Electric	Vertically Integrated	4/26/2018	9.50	48.50	Average / 3			48.50
Indiana	Indiana Michigan Power Co.	Ca-44967	Electric	Vertically Integrated	5/30/2018	9.95	35.73	Average / 1			
Maryland	Potomac Electric Power Co.	C-9472	Electric	Distribution	5/31/2018	9.50	50.44	Below Average / 3			50.44
New York	Central Hudson Gas & Electric	C-17-E-0459	Electric	Distribution	6/14/2018	8.80	48.00	Average / 1	48.00		
Hawaii	Hawaiian Electric Co.	D-2016-0328	Electric	Vertically Integrated	6/22/2018	9.50	57.10	Average / 2		57.10	
North Carolina	Duke Energy Carolinas LLC	D-E-7, Sub 1146	Electric	Vertically Integrated	6/22/2018	9.90	52.00	Average / 1	52.00		
Maine	Versant Power	D-2017-00198	Electric	Distribution	6/29/2018	9.35	49.00	Average / 2		49.00	
Hawaii	Hawaii Electric Light Co	D-2015-0170	Electric	Vertically Integrated	8/8/2018	9.50	56.69	Average / 2		56.69	
District of Columbia	Potomac Electric Power Co.	FC-1150	Electric	Distribution	8/21/2018	9.53	50.44	Below Average / 3			50.44
Delaware	Delmarva Power & Light Co.	D-17-0977	Electric	Distribution	8/21/2018	9.70	50.52	Average / 3			50.52
Rhode Island	Narragansett Electric Co.	D-4770 (electric)	Electric	Distribution	8/24/2018	9.28	50.95	Average / 2		50.95	
New Mexico	Southwestern Public Service Co	C-17-00255-UT	Electric	Vertically Integrated	9/5/2018	9.56	53.97	Below Average / 2			53.97
Wisconsin	Wisconsin Power and Light Co	D-6680-UR-121 (Elec)	Electric	Vertically Integrated	9/14/2018	10.00	52.00	Above Average / 2	52.00		
Wisconsin	Madison Gas and Electric Co.	D-3270-UR-122 (Elec)	Electric	Vertically Integrated	9/20/2018	9.80	56.06	Above Average / 2	56.06		
Ohio	The Dayton Power & Light Co.	C-15-1830-EL-AIR	Electric	Distribution	9/26/2018	10.00	47.52	Average / 2		47.52	
North Dakota	Oter Tail Power Co.	C-PU-17-398	Electric	Vertically Integrated	9/26/2018	9.77	52.50	Average / 1	52.50		
Kansas	Energy Kansas Central Inc.	D-18-WSEE-328-RTS	Electric	Vertically Integrated	9/27/2018	9.30	51.24	Below Average / 1			51.24
Pennsylvania	UGI Utilities Inc.	D-R-2017-2640058	Electric	Distribution	10/4/2018	9.85	54.02	Above Average / 3	54.02		
New Jersey	Public Service Electric Gas	D-ER18010029	Electric	Distribution	10/29/2018	9.60	54.00	Below Average / 1			54.00
Indiana	AES Indiana	Ca-45029	Electric	Vertically Integrated	10/31/2018	9.99	39.67	Average / 1			
Kansas	Energy Metro Inc	D-18-KCPE-480-RTS	Electric	Vertically Integrated	12/13/2018	9.30	49.09	Below Average / 1			49.09
Oregon	Portland General Electric Co.	D-UE-335	Electric	Vertically Integrated	12/14/2018	9.50	50.00	Average / 2	50.00		
Ohio	Duke Energy Ohio Inc.	C-17-0032-EL-AIR	Electric	Distribution	12/19/2018	9.84	50.75	Average / 2		50.75	
Texas	Texas-New Mexico Power Co.	D-48401	Electric	Distribution	12/20/2018	9.65	45.00	Average / 3			45.00
Michigan	Consumers Energy Co.	C-U-20134	Electric	Vertically Integrated	1/9/2019	10.00	NA	Above Average / 3			
West Virginia	Appalachian Power Co.	C-18-0646-E-42T	Electric	Vertically Integrated	2/27/2019	9.75	50.16	Below Average / 2			50.16
New Jersey	Atlantic City Electric Co.	D-ER18080925	Electric	Distribution	3/13/2019	9.60	49.94	Below Average / 1			49.94
New York	Orange & Rockland Utits Inc.	C-18-E-0067	Electric	Distribution	3/14/2019	9.00	48.00	Average / 1	48.00		
Oklahoma	Public Service Co. of OK	Ca-PUD201800097	Electric	Vertically Integrated	3/14/2019	9.40	NA	Average / 3			NA
Maryland	The Potomac Edison Co.	C-9490	Electric	Distribution	3/22/2019	9.65	52.82	Below Average / 3			52.82
Kentucky	Kentucky Utilities Co.	C-2018-00294	Electric	Vertically Integrated	4/30/2019	9.73	NA	Average / 1	NA		
Kentucky	Louisville Gas & Electric Co.	C-2018-00295 (elec)	Electric	Vertically Integrated	4/30/2019	9.73	NA	Average / 1	NA		
South Carolina	Duke Energy Carolinas LLC	D-2018-319-E	Electric	Vertically Integrated	5/1/2019	9.50	53.00	Average / 3			53.00
Michigan	DTE Electric Co.	C-U-20162	Electric	Vertically Integrated	5/2/2019	10.00	37.94	Above Average / 3			
South Carolina	Duke Energy Progress LLC	D-2018-318-E	Electric	Vertically Integrated	5/8/2019	9.50	53.00	Average / 3			53.00
South Dakota	Oter Tail Power Co.	D-EL18-021	Electric	Vertically Integrated	5/14/2019	8.75	52.92	Average / 2		52.92	
Hawaii	Mau Electric Company Ltd	D-2017-0150	Electric	Vertically Integrated	5/16/2019	9.50	57.02	Average / 2		57.02	
Michigan	Upper Peninsula Power Co.	C-U-20276	Electric	Vertically Integrated	5/23/2019	9.90	NA	Above Average / 3			
Maryland	Potomac Electric Power Co.	C-9602	Electric	Distribution	8/12/2019	9.60	50.46	Below Average / 3			50.46
Wisconsin	Northern States Power Co.	D-4220-UR-150	Electric	Vertically Integrated	9/4/2019	10.00	52.52	Above Average / 2			
Massachusetts	Massachusetts Electric Co.	DP-18-180	Electric	Distribution	9/30/2019	9.60	53.49	Average / 2			
Wisconsin	Wisconsin Electric Power Co.	D-6690-UR-124 (Elec)	Electric	Vertically Integrated	10/31/2019	10.00	54.46	Above Average / 2	54.46		
Wisconsin	Wisconsin Public Service Corp.	D-6690-UR-126 (Elec)	Electric	Vertically Integrated	10/31/2019	10.00	51.96	Above Average / 2			
Louisiana	Energy New Orleans LLC	D-UD-18-07 (elec)	Electric	Vertically Integrated	11/7/2019	9.35	50.00	Average / 2	51.96		
Idaho	Avista Corp.	CaVIL-E-19-04	Electric	Vertically Integrated	11/29/2019	9.50	50.00	Average / 2		50.00	
Indiana	Northern IN Public Svc Co.	Ca-45159	Electric	Vertically Integrated	12/4/2019	9.75	47.86	Average / 1			
Maryland	Baltimore Gas and Electric Co.	C-9610 (EL)	Electric	Distribution	12/17/2019	9.70	NA	Below Average / 2			NA
Georgia	Georgia Power Co.	D-42516	Electric	Vertically Integrated	12/17/2019	10.50	56.00	Above Average / 2	56.00		
California	San Diego Gas & Electric Co.	A-19-04-017 (Elec)	Electric	Vertically Integrated	12/19/2019	10.20	52.00	Average / 2			52.00
California	Pacific Gas and Electric Co.	A-19-04-015	Electric	Vertically Integrated	12/19/2019	10.25	52.00	Average / 2			52.00
California	Southern California Edison Co.	A-19-04-014	Electric	Vertically Integrated	12/19/2019	10.30	52.00	Average / 2			52.00

Duke Energy Ohio, Inc.

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Arkansas	Southwestern Electric Power Co	D-19-008-U	Electric	Vertically Integrated	12/20/2019	9.45	33.71	Average / 1			
Montana	Northwestern Corp.	D20182.12	Electric	Vertically Integrated	12/20/2019	9.65	49.38	Below Average / 1			49.38
Nevada	Sierra Pacific Power Co.	D-19-06002	Electric	Vertically Integrated	12/24/2019	9.70	50.92	Average / 2		50.92	
Iowa	Interstate Power & Light Co.	D-RPU-2019-0001	Electric	Vertically Integrated	1/8/2020	10.02	51.00	Average / 1	51.00		
New York	Consolidated Edison Co. of NY	C-19-E-0065	Electric	Distribution	1/16/2020	8.80	48.00	Average / 1	48.00		
New Jersey	Rockland Electric Company	D-ER19050552	Electric	Distribution	1/22/2020	9.50	48.32	Below Average / 1			48.32
Michigan	Indiana Michigan Power Co.	C-U-20359	Electric	Vertically Integrated	1/23/2020	9.86	46.56	Above Average / 3			
California	PacificCorp	A-18-04-002	Electric	Vertically Integrated	2/6/2020	10.00	51.96	Average / 2		51.96	
Colorado	Public Service Co. of CO	D-19AL-0268E	Electric	Vertically Integrated	2/11/2020	9.30	55.61	Average / 2		55.61	
Texas	CenterPoint Energy Houston	D-49421	Electric	Distribution	2/14/2020	9.40	42.50	Average / 2		42.50	
Maine	Central Maine Power Co.	D-2018-00194	Electric	Distribution	2/19/2020	8.25	50.00	Average / 2		50.00	
North Carolina	E-22, Sub 562	D-2018-00194	Electric	Vertically Integrated	2/24/2020	9.75	52.00	Average / 1	52.00		
Texas	AEP Texas Inc.	D-49494	Electric	Distribution	2/27/2020	9.40	42.50	Average / 2		42.50	
Indiana	Ca-45235	D-49494	Electric	Vertically Integrated	3/11/2020	9.70	37.55	Average / 1			48.50
Washington	Avista Corp.	D-UE-190334	Electric	Vertically Integrated	3/25/2020	9.40	48.50	Average / 3			
Massachusetts	Fitchburg Gas & Electric Light	DPU 19-130	Electric	Vertically Integrated	4/17/2020	9.70	52.45	Average / 2		52.45	
Kentucky	Duke Energy Kentucky Inc.	C-2019-00271	Electric	Vertically Integrated	4/27/2020	9.25	48.23	Average / 1	48.23		
Michigan	DTE Electric Co.	C-U-20561	Electric	Vertically Integrated	5/8/2020	9.90	38.32	Above Average / 3			54.77
New Mexico	Southwestern Public Service Co	C-19-00170-UT	Electric	Vertically Integrated	5/20/2020	9.45	54.77	Below Average / 2			
Indiana	Duke Energy Indiana, LLC	Ca-45253	Electric	Vertically Integrated	6/29/2020	9.70	40.98	Average / 1			
New Hampshire	Liberty Utilities Granite St	D-DE-19-064	Electric	Distribution	6/30/2020	9.10	52.00	Average / 3			52.00
Missouri	Empire District Electric Co.	C-ER-2019-0374	Electric	Vertically Integrated	7/1/2020	9.25	46.00	Average / 3			46.00
Washington	Puget Sound Energy Inc.	D-UE-190529	Electric	Vertically Integrated	7/8/2020	9.40	48.50	Average / 3			48.50
Maryland	Delmarva Power & Light Co.	C-9630	Electric	Distribution	7/14/2020	9.60	50.53	Below Average / 2			50.53
Hawaii	Hawaiian Electric Light Co.	D-2018-0368	Electric	Vertically Integrated	7/28/2020	9.50	56.83	Average / 2		56.83	
Texas	Southwestern Public Service Co	D-49831	Electric	Vertically Integrated	8/27/2020	9.45	54.62	Average / 2		54.62	
California	Liberty Utilities (CalPeco Ele	A-18-12-001	Electric	Vertically Integrated	8/27/2020	10.00	52.50	Average / 2		52.50	
Hawaii	Hawaiian Electric Co.	D-2019-0085	Electric	Vertically Integrated	10/22/2020	9.50	56.83	Average / 2			51.44
New Jersey	Jersey Cntrl Power & Light Co.	D-ER20020146	Electric	Distribution	10/28/2020	9.60	51.44	Below Average / 1			
New York	NY State Electric & Gas Corp.	C-19-E-0378	Electric	Distribution	11/19/2020	8.80	48.00	Average / 1	48.00		
New York	Rochester Gas & Electric Co	C-19-E-0380	Electric	Distribution	11/19/2020	8.80	48.00	Average / 1	48.00		
Virginia	Appalachian Power Co.	C-PUR-2020-00015	Electric	Vertically Integrated	11/24/2020	9.20	NA	Average / 1	NA		
Wisconsin	Madison Gas and Electric Co.	D-3270-UR-123 (Elec)	Electric	Vertically Integrated	11/24/2020	9.80	55.00	Above Average / 2	55.00		
Nevada	Nevada Power Co.	D-20-06003	Electric	Vertically Integrated	12/10/2020	9.40	NA	Average / 2		NA	
Washington	PacificCorp	D-UE-191024	Electric	Vertically Integrated	12/14/2020	9.50	49.10	Average / 3			49.10
New Hampshire	Public Service Co. of NH	D-DE-19-057	Electric	Distribution	12/15/2020	9.30	54.40	Average / 3			54.40
Maryland	Baltimore Gas and Electric Co.	C-9645 (EL)	Electric	Distribution	12/16/2020	9.30	52.00	Below Average / 2			52.00
Michigan	Consumers Energy Co.	C-U-20697	Electric	Vertically Integrated	12/17/2020	9.90	NA	Above Average / 3			
Oregon	PacificCorp	D-UE-374	Electric	Vertically Integrated	12/18/2020	9.50	50.00	Average / 2		50.00	
Arizona	Tucson Electric Power Co.	D-E-01933A-19-0028	Electric	Vertically Integrated	12/23/2020	9.15	53.08	Below Average / 3			53.08
Wisconsin	Wisconsin Power and Light Co	D-6680-UR-122 (Elec)	Electric	Vertically Integrated	12/23/2020	10.00	52.53	Above Average / 2			
Utah	PacificCorp	D-20-035-04	Electric	Vertically Integrated	12/30/2020	9.65	52.50	Average / 2	52.53		
Kentucky	Duke Energy Power Co.	C-2020-00174	Electric	Vertically Integrated	1/13/2021	9.30	43.25	Average / 1	43.25		
North Carolina	Duke Energy Carolinas LLC	D-E-7, Sub 1214	Electric	Vertically Integrated	3/31/2021	9.60	52.00	Average / 1	52.00		
North Carolina	Duke Energy Progress LLC	D-E-2, Sub 1219	Electric	Vertically Integrated	4/16/2021	9.60	52.00	Average / 1	52.00		
Florida	Duke Energy Florida LLC	D-20210016-EI	Electric	Vertically Integrated	5/4/2021	9.85	44.84	Above Average / 2			
Wyoming	PacificCorp	D-20000-578-ER-20	Electric	Vertically Integrated	5/18/2021	9.50	51.00	Average / 2		51.00	
District of Columbia	Potomac Electric Power Co.	FC-1136	Electric	Distribution	6/4/2021	9.28	50.68	Below Average / 3			50.68
New Mexico	El Paso Electric Co.	C-20-00104-UT	Electric	Vertically Integrated	6/28/2021	9.00	49.21	Below Average / 2			49.21
Maryland	Potomac Electric Power Co.	C-9655	Electric	Distribution	6/28/2021	9.55	50.50	Average / 3			50.50
Kentucky	Kentucky Utilities Co.	C-2020-00349	Electric	Vertically Integrated	6/30/2021	9.43	NA	Average / 1	NA		
Kentucky	Louisville Gas & Electric Co.	C-2020-00350 (elec)	Electric	Vertically Integrated	6/30/2021	9.43	NA	Average / 1	NA		
New Jersey	Atlantic City Electric Co.	D-ER20120746	Electric	Distribution	7/14/2021	9.60	50.21	Below Average / 1			50.21
South Carolina	Dominion Energy South Carolina	D-2020-00350-E	Electric	Vertically Integrated	7/21/2021	9.50	51.62	Average / 3			51.62
Delaware	Delmarva Power & Light Co.	D-20-0149	Electric	Distribution	8/5/2021	9.60	NA	Average / 3			NA
North Dakota	Northern States Power Co.	C-PU-20-441	Electric	Vertically Integrated	8/18/2021	9.50	52.50	Average / 1	52.50		
Idaho	Avista Corp.	C-AU-E-21-01	Electric	Vertically Integrated	9/1/2021	9.40	50.00	Average / 2		50.00	
Washington	Tampa Electric Co.	D-UE-200900	Electric	Vertically Integrated	9/27/2021	9.40	48.50	Average / 3			48.50
Florida	Florida Power & Light Co.	D-20210034-EI	Electric	Vertically Integrated	10/21/2021	9.95	45.07	Above Average / 2			
Maine	Versant Power	D-20210015-EI	Electric	Vertically Integrated	10/26/2021	10.60	NA	Above Average / 2			
Maine	Versant Power	D-2020-00316	Electric	Distribution	10/28/2021	9.35	49.00	Average / 3			49.00
Arizona	Arizona Public Service Co.	D-E-01345A-19-0236	Electric	Vertically Integrated	11/2/2021	8.70	54.67	Below Average / 2			54.67

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Minnesota	Otter Tail Power Co.	D-E-017/GR-20-719	Electric	Vertically Integrated	11/4/2021	9.48	52.50	Average / 2		52.50	
Ohio	Ohio Power Co.	C-20-0585-EL-AIR	Electric	Distribution	11/17/2021	9.70	54.43	Average / 3			54.43
New York	Central Hudson Gas & Electric	C-20-E-0428	Electric	Distribution	11/18/2021	9.00	50.00	Average / 2		50.00	
Texas	Southwestern Electric Power Co	D-51415	Electric	Vertically Integrated	11/18/2021	9.25	49.37	Average / 3			49.37
Virginia	Virginia Electric & Power Co.	C-PUR-2021-00058	Electric	Vertically Integrated	11/18/2021	9.35	51.92	Average / 1	51.92		
Wisconsin	Northern States Power Co.	D-4220-UR-125 (Elec)	Electric	Vertically Integrated	11/18/2021	10.00	52.50	Above Average / 2	52.50		
Wisconsin	Wisconsin Power and Light Co	D-6680-UR-123 (Elec)	Electric	Vertically Integrated	11/18/2021	10.00	52.50	Above Average / 2	52.50		
Wisconsin	Madison Gas and Electric Co.	D-3270-UR-124 (Elec)	Electric	Vertically Integrated	11/23/2021	9.80	55.00	Above Average / 2	55.00		
Arkansas	Entergy Arkansas LLC	D-16-036-FR (2021 review)	Electric	Vertically Integrated	12/7/2021	9.65	37.75	Average / 1			
New Jersey	Rockland Electric Company	D-ER21050823	Electric	Distribution	12/15/2021	9.60	48.51	Below Average / 1			48.51
Michigan	Consumers Energy Co.	C-U-20963	Electric	Vertically Integrated	12/22/2021	9.90	41.84	Above Average / 3			
Oklahoma	Public Service Co. of OK	Ca-PUD202100055	Electric	Vertically Integrated	12/28/2021	9.40	NA	Average / 2	NA		
New York	Niagara Mohawk Power Corp.	C-20-E-0380	Electric	Distribution	1/20/2022	9.00	48.00	Average / 2		48.00	
New Mexico	Southwestern Public Service Co	C-20-00238-UT	Electric	Vertically Integrated	2/16/2022	9.35	54.72	Below Average / 2			54.72
Indiana	Indiana Michigan Power Co.	Ca-45576	Electric	Vertically Integrated	2/23/2022	9.70	40.70	Average / 1			
Colorado	Public Service Co. of CO	D-21AL-0317E	Electric	Vertically Integrated	3/16/2022	9.30	55.69	Average / 1	55.69		
Colorado	Orange & Rockland Utils Inc.	C-21-E-0074	Electric	Distribution	4/14/2022	9.20	48.00	Average / 2		48.00	
Oregon	Portland General Electric Co.	D-UE-394	Electric	Vertically Integrated	4/25/2022	9.50	50.00	Average / 2		50.00	
New Hampshire	Unitil Energy Systems Inc.	D-DE-21-030	Electric	Distribution	5/12/2022	9.20	52.00	Average / 2		52.00	
Arkansas	Southwestern Electric Power Co	D-21-070-U	Electric	Vertically Integrated	5/23/2022	9.50	44.54	Average / 1			
Total Cases						144			33	37	42
Mean						9.57			51.14	51.51	50.80
Median						9.54			52.00	51.96	50.48
Maximum						10.60			56.06	57.10	54.77
Minimum						8.25			41.68	42.50	45.00

Source: Regulatory Research Associates

Duke Energy Ohio, Inc.
 Calculation of Price Appreciation and Annualized Volatility of the
Combined Electric Proxy Group, Other Utility Indices, and Market Indices since January 31, 2020

<u>Combined Electric Proxy Group</u>	<u>Price Appreciation (1)</u>	<u>Annualized Volatility (2)</u>
ALLETE, Inc.	-24.16%	37.41%
Alliant Energy Corporation	6.72%	28.94%
Ameren Corporation	15.58%	30.83%
American Electric Power Company, Inc.	-0.42%	28.15%
Avista Corporation	-13.82%	36.88%
CMS Energy Corporation	1.69%	28.77%
Consolidated Edison, Inc.	5.44%	29.84%
Dominion Energy, Inc.	-3.41%	31.95%
Duke Energy	12.93%	29.49%
Edison International	-7.58%	33.31%
Entergy Corporation	-7.99%	34.05%
Eversource Energy	-1.76%	34.44%
Eversource Energy	0.72%	32.85%
Hawaiian Electric Industries, Inc.	-11.53%	34.19%
IDACORP, Inc.	1.42%	31.15%
NextEra Energy, Inc.	34.93%	33.47%
NorthWestern Corporation	-27.36%	37.57%
OGE Energy Corporation	-8.48%	31.86%
Pinnacle West Capital Corporation	-20.85%	33.27%
Portland General Electric Company	-11.12%	35.60%
The Southern Company	10.97%	32.36%
WEC Energy Group	5.76%	31.20%
Xcel Energy, Inc.	9.78%	29.10%
Average	<u>-1.42%</u>	<u>32.46%</u>
Dow Jones Utility Average	<u>10.97%</u>	<u>27.53%</u>
Utilities Select SPDR Fund	<u>11.22%</u>	<u>27.68%</u>
Dow Jones Industrial Average	<u>19.48%</u>	<u>26.04%</u>
S&P 500	<u>32.70%</u>	<u>25.94%</u>

Notes:

- (1) (8/12/2022 price minus 1/31/2020 price) divided by 1/31/2020 price.
 (2) Standard deviation of returns over the period multiplied by the square root of 252, or number of trading days in a year.

Source: S&P Market Intelligence, S&P Capital IQ

Duke Energy Ohio, Inc.
Demonstration of the Inadequacy of
a DCF Return Rate Related to Book Value
When Market Value is Greater than Book Value

<u>Line No.</u>		[A]	[B]
		Based on Dr. Woodridge's Proxy Group	
		<u>Market Value</u>	<u>Book Value</u>
1.	Per Share	\$ 76.23 (1)	\$ 35.73 (2)
2.	DCF Cost Rate (3)	8.90%	8.90%
3.	Return in Dollars (4)	\$ 6.785	\$ 3.180
4.	Dividends (5)	\$ 2.516	\$ 2.516
5.	Growth in Dollars (6)	\$ 4.269	\$ 0.664
6.	Return on Market Value (7)	8.90%	4.17%
7.	Rate of Growth on Market Value (8)	5.60%	0.87%

Notes:

- (1) Average of market prices for Dr. Woodridge's proxy group
- (2) Average book value calculated by dividing total common equity at year-end 2021 by common shares outstanding at year-end 2021 for each proxy group
- (3) Recommended DCF cost rate for Dr. Woodridge.
- (4) Line 1 * Line 2.
- (5) Dividends are based on Dr. Woodridge's reported dividend yields.
- (6) Line 3 - Line 4.
- (7) Line 3 / Line 1.
- (8) Line 5 / Line 1.

Duke Energy Ohio, Inc.
Calculation of Indicated DCF Applied to Book Value Capital Structure of
Dr. Woolridge's Electric Proxy Group

Un-lever Indicated Market Capital Structure DCF

Ku	=	Ke	-	((	Ku	-	i	)	1	-	t	)	D	/	E	)	-	(	Ku	-	d	)	P	/	E
Ku	=	8.90%	-	((	Ku	-	3.80%	)	1	-	21%	)	41.30%	/	58.31%	)	-	(	Ku	-	4.78%	)	0.39%	/	58.31%
Ku	=	8.90%	-	((	Ku	-	3.80%	)	79.00%	)			70.83%			)	-	(	Ku	-	4.78%	)			0.67%
Ku	=	8.90%	-	((	79.00%	*	Ku	-	3.0007%	)			70.83%			)	-	(	0.67%	*	Ku	-	0.03%	)	
Ku	=	8.90%	-	(	55.95%	*	Ku	-	2.13%	)			-0.67%			*			Ku	+	0.03%				
Ku	=	8.90%			-55.95%	*	Ku	+	2.13%				-0.67%			*			Ku	+	0.03%				
Ku	=	11.06%			-56.62%	*	Ku																		
156.62%	*	Ku	=		11.06%																				
		Ku	=		7.06%																				

Re-lever to Indicated Book Value Capital Structure DCF

Ke	=	Ku	+	((	Ku	-	i	)	1	-	t	)	D	/	E	)	+	(	Ku	-	d	)	P	/	E
Ke	=	7.06%	+	((	7.06%	-	3.80%	)	1	-	21%	)	57.04%	/	42.38%	)	+	(	7.06%	-	4.78%	)	0.58%	/	42.38%
Ke	=	7.06%	+	((	3.26%			)	79%	)			134.59%	)	+	(	2.28%							1.37%	
Ke	=	7.06%	+	((	2.58%			)	134.59%	)	+	(	0.03%	)											
Ke	=	7.06%	+	(	3.47%			)	+			0.03%													
		Ke	=		10.56%																				

Where:

- Ku = Un-levered (i.e., 100% equity) cost of common equity
- Ke = Market determined cost of common equity
- i = Cost of debt
- t = Income tax rate
- D = Debt ratio
- E = Equity ratio
- d = Cost of preferred stock
- P = Preferred equity ratio

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Summary: Testimony Second Supplemental Direct Testimony of Dylan D'Ascendis electronically filed by Mrs. Debbie L. Gates on behalf of Duke Energy Ohio Inc. and D'Ascenzo, Rocco O. Mr. and Kingery, Jeanne W and Vaysman, Larisa and Akhbari, Elyse