

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION  
DOCKET NO. E-34, SUB 54  
DOCKET NO. E-34, SUB 55

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  )  
In the Matter of Application for        )  
General Rate Case                        )  
  )  
DOCKET NO. E-34, SUB 55            )  
  )  
In the Matter of Petition of            )  
Appalachian State University d/b/a    )  
New River Light and Power for an     )  
Accounting Order to Defer Certain     )  
Capital Costs and New Tax             )  
Expenses                                    )

**DIRECT TESTIMONY OF**  
**JASON W. HOYLE**  
**ON BEHALF OF**  
**APPALACHIAN VOICES**

**JUNE 6, 2023**

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1 **I. Introduction**

2 **Q. Please state your name, business address, and current position.**

3 A. My name is Jason W. Hoyle. My business address is 1155 Kildaire Farm  
4 Rd., Suite 202, Cary, North Carolina, 27511. My current position is Principal  
5 Energy Policy Analyst of EQ Research LLC.

6 **Q. On whose behalf are you submitting testimony?**

7 A. I am submitting testimony on behalf of Appalachian Voices (AV).

8 **Q. Have you previously submitted testimony before the North Carolina  
9 Utilities Commission (NCUC or the Commission)?**

10 A. No. I have not previously submitted testimony before the Commission.

11 **Q. Please describe your educational and occupational background.**

12 A. I obtained a Bachelor of Science in Mass Communications with a  
13 concentration in print journalism from Appalachian State University in  
14 Boone, NC in 2001 and a Master of Business Administration from  
15 Appalachian State University in 2003. I was employed at the Appalachian  
16 Energy Center and the Center for Economic Research and Policy Analysis  
17 in various positions of increasing responsibility for nearly 18 years. I was  
18 the lead analyst responsible for due diligence, regulatory compliance  
19 analysis, pro forma financial and valuation analysis, including PPA  
20 negotiations and innovative carbon financing opportunities for nearly a  
21 dozen community-based renewable energy projects on behalf of local  
22 governments across North Carolina. My work also included research,

1 analysis, and implementation activities related to a variety of energy policy  
2 and related programs such as the N.C. State Energy Plan, the North  
3 Carolina Climate Action Plan Advisory Group, U.S. Environmental  
4 Protection Agency programs, Climate Action Reserve protocols, as well as  
5 a variety of other consulting work performed on behalf of state universities,  
6 municipal and county governments, and non-profit corporations. I also  
7 served as a faculty member in the Appalachian State University's  
8 Department of Sustainable Technology and the Built Environment between  
9 2012 and 2021, where I developed and taught graduate and undergraduate  
10 courses on focused on the policy, market, and economic context of utility  
11 regulation. These courses covered topics ranging from regulatory oversight  
12 roles and the development of electric utility regulation from the later 1800s  
13 through the present day, review and analysis of electric utility rates for the  
14 purchase and sale of electricity, finance, and environmental attribute  
15 markets. While at Appalachian State, I also developed curriculum for and  
16 taught professional continuing education courses on renewable energy  
17 policy, finance, and regulation that offered AIA Learning Units, engineering  
18 Professional Development Hours, CPA (CPE) credits, Continuing Legal  
19 Education credits, SWANA Continuing Education Units, and Continuing  
20 Forestry Education credits.

21 I joined EQ Research in early 2022 as a Principal Energy Policy  
22 Analyst. In my current position, I lead EQ General Rate Case service which

1 includes preparing and reviewing analyses of rate case filings for electric  
2 utilities across the country. I also coordinate EQ Research's regulatory and  
3 compliance consulting services for Community Choice Aggregation  
4 programs in California, including regulatory monitoring and analysis,  
5 compliance reporting, litigation support, and resource procurement  
6 planning, including the preparation of integrated resource planning and  
7 other resource procurement plans.

8 I coordinate and contribute to EQ Research's various research  
9 projects for clients, provide oversight of EQ Research's electric industry  
10 tracking services and consulting projects, and perform customized research  
11 and analyses to fulfill client requests. My CV is included as Exhibit JWH-1.

12 **Q. Please describe the purpose of your testimony and how it is**  
13 **organized.**

14 A. My testimony addresses three topics, which I have separated into the  
15 following sections:

- 16 • Section II addresses the proposed rate of return (ROR), return on equity  
17 (ROE), cost of debt, and capital structure Appalachian State University  
18 (ASU) d/b/a/ New River Light and Power (NRLP) has submitted for  
19 approval; identifies issues with those proposals; recommends an  
20 alternative ROR, ROE, cost of debt, and capital structure; recommends  
21 that NRLP conduct a discounted cash flow (DCF) analysis following the  
22 Commission's final order in this proceeding to better optimize its capital

1 structure and capital funding sources for its operations going forward  
2 and for use and incorporation in future general rate cases; and  
3 recommends that the Commission require NRLP to make a compliance  
4 filing updating its proposed ROR and capital structure following its DCF  
5 analysis.

- 6 • Section III addresses the establishment of energy efficiency (EE) and  
7 demand-side management (DSM) programs by NRLP, which the  
8 stipulation adopted in NRLP's last general rate case required and which  
9 the Company has failed to establish since then.
- 10 • Section IV contains my concluding remarks and summarized  
11 recommendations.

12 **Q. Are you sponsoring any exhibits as part of your testimony?**

13 A. Yes. I am sponsoring Exhibit JWH-1 which contains my CV. I am also  
14 sponsoring Exhibit JWH-2 which provides examples of EE/DSM programs  
15 from across North Carolina similar to the types of programs identified by  
16 NRLP.

17 **Q. Please summarize your recommendations to the Commission**  
18 **regarding NRLP's proposals relating to ROR, ROE, cost of equity, cost**  
19 **of long-term debt, and capital structure.**

20 A. My recommendations are as follows:

- 1           • The Commission should direct NRLP to move to actual, cost-based  
2           values as a basis for ROE, cost of debt, ROR, and capital structure in  
3           this case and in future cases.
- 4           • The Commission should direct NRLP to develop a DCF analysis and  
5           develop a comprehensive financing strategy that optimizes the capital  
6           structure for the utility considering its status as an operating unit of ASU.
- 7           • The Commission should direct NRLP to make a compliance filing  
8           updating its proposed ROR and capital structure following its DCF  
9           analysis.
- 10          • The Commission should approve an ROE that reflects the actual cost of  
11          obtaining capital that NRLP faces. I recommend using the 5% value as  
12          a starting point in setting the approved ROE for NRLP and that the  
13          starting point for the allowed ROE be increased by an additional 1.25%  
14          to reflect that the rate for bonds would also be adjusted to account for  
15          debt service coverage, and I recommend that the Commission approve  
16          6.25% as an ROE for use in setting NRLP's weighted average cost of  
17          capital.
- 18          • I recommend that the Commission authorize NRLP to use its historical  
19          embedded cost of debt of 2.30% in its capital structure and for use in  
20          developing its weighted average cost of capital.
- 21          • I recommend that the Commission approve the 78.3% equity / 21.7%  
22          long-term debt capital structure based on NRLP's actual cost of service.

1           • I recommend an ROR of 5.39% for NRLP.

2   **Q. Please summarize your recommendations to the Commission**  
3   **regarding the establishment of EE/DSM programs by NRLP.**

4   A. My recommendations are as follows:

- 5           • NRLP should formally propose the three EE/DSM programs it has  
6           already identified and listed, guided by the program designs discussed  
7           in Exhibit JWH-2, as pilot programs of limited duration.
- 8           • NRLP should prepare and file an EE/DSM plan that addresses the topics  
9           identified herein and that specifically includes a market evaluation, an  
10          evaluation of multiple EE/DSM program options, an EM&V plan (that  
11          would apply to the pilot programs at a minimum, and ideally to other  
12          future programs as well), and a clear timeline with program development  
13          milestones. NRLP should develop the EE/DSM plan concurrently with  
14          the pilot EE/DSM offerings discussed above and use the plan and the  
15          results of the pilots to develop permanent offerings at the end of the pilot  
16          period.
- 17          • As a complement to the three programs discussed above, NRLP should  
18          develop a behavior-based DSM program that allows NRLP to  
19          communicate with customers as a means of reducing NRLP load during  
20          times of grid stress and during coincident peak hours. The  
21          communications could, among other things, inform customers about the  
22          three programs discussed above. For maximum effect, given the high



1 proportion of students in NRLP's service territory, the program should  
2 be available to all electricity consumers in NRLP's service territory and  
3 not restricted exclusively to NRLP customers. NRLP should develop this  
4 as a pilot program as well and evaluate its effectiveness along with the  
5 other three pilot programs at the end of the pilot period.

- 6 • NRLP should consider adding a program focused on weatherization and  
7 building retrofits/upgrades, particularly for older less energy efficient  
8 residential units.

## 9

## 10 **II. Return on Equity, Cost of Debt, Rate of Return, and**

## 11 **Capital Structure**

12 **Q. Please provide a brief overview of the cost of capital sections of your**  
13 **testimony.**

14 A. I review NRLP's proposed, allowed ROE of 9.60%,<sup>1</sup> proposed, allowed  
15 overall rate of return ROR of 7.007%, and proposed, hypothetical equity to  
16 long-term debt ratio of 52% equity to 48% debt from which NRLP's  
17 proposed ROR is derived. I find that NRLP's proposals are unreasonable  
18 and unjustified because they are not cost-based, because they violate  
19 accepted rate making standards and are benchmarked against

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<sup>1</sup> As explained in my testimony, NRLP does not actually face a cost of equity, nor does it benchmark its proposed ROE against comparable utilities facing comparable market risks and demand for capital.

1 inappropriate industry data, and because they would therefore unjustly  
2 burden NRLP's customers and improperly impact the transfer of NRLP  
3 profits to the ASU Endowment Fund under North Carolina law.<sup>2</sup>

4 **Q. What do you recommend that the Commission do in response to**  
5 **NRLP's proposals?**

6 A. I recommend that NRLP's proposals relating to cost of equity, cost of long-  
7 term debt, and capital structure be rejected by the Commission. Instead, I  
8 propose that the Commission approve an allowed rate of return based on  
9 NRLP and ASU's actual costs. My recommendation for an improved capital  
10 structure for NRLP is in Table JWH-1, below.

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<sup>2</sup> North Carolina law provides for the transfer of NRLP's net profits to the ASU Endowment Fund. N.C.G.S. § 116-35 states that all net profits are to be paid to the Endowment fund. NRLP does not have any input into how Endowment funds are to be allocated; to the extent the Endowment allocates funds for scholarships, then NRLP staff and customers do have a voice in selecting student recipients funded from NRLP net profits. NRLP response to AV 3-9(b). As explained later in this testimony, NRLP excessively and expensively relies on retained earnings to fund its capital projects. This has the effect of increasing costs to customers, including ASU, and of decreasing the net profits available for transfer to the Endowment Fund. ASU has averaged a 4.73% return on Endowment funds. NRLP response to AV 7-1. The excessive use of retained earnings to fund capital projects reduces the transfer and the return on transfers, while at the same time charging ASU, ASU students, and NRLP non-university customers much more for electric service than is reasonable or justified.

1

**Table JWH-1: Proposed ROR for NRLP**

<b>Capital Structure as Adjusted to reflect NRLP's Actual Debt, Actual Capital Structure, and a Cost of Equity of 5% Bond Interest Rate plus 125 basis points for debt service coverage</b>			
<b>Capitalization Component</b>	<b>Ratio</b>	<b>Cost</b>	<b>Weighted Cost</b>
Equity	78%	6.25%	4.89375%
Long-Term Debt	22%	2.3%	0.49910%
			5.39285%

2 **II.A. NRLP's PROPOSED ROE, COST OF DEBT, ROR, AND**  
3 **CAPITAL STRUCTURE**

4 **Q. What are NRLP's current capital structure, allowed ROE, cost of debt,**  
5 **and allowed ROR?**

6 A. NRLP's current capital structure is set out in NRLP witness Randall E.  
7 Halley's testimony,<sup>3</sup> as shown below:

8 **Table JWH-2, NRLP Current Capital Structure**

<b>Capitalization Component</b>	<b>Ratio</b>	<b>Cost</b>	<b>Weighted Cost</b>
Long-Term Debt	21.7%	2.30%	0.498%
Equity	78.3%	9.60%	7.517%
			8.015%

9

10 **Q. What does NRLP propose for its capital structure, allowed ROE, cost**  
11 **of debt, and allowed ROR in this proceeding?**

<sup>3</sup> Direct Testimony of Randall E. Halley on behalf of Appalachian State University d/b/a New River Light and Power at 30, Table 5 ("Halley Direct").

1 A. NRLP’s proposed capital structure is set out in NRLP witness Halley’s  
2 testimony,<sup>4</sup> as shown below:

3 **Table JWH-3, NRLP Proposed Capital Structure**

Capitalization Component	Ratio	Cost	Weighted Cost
Long-Term Debt	48%	4.20%	2.015%
Equity	52%	9.60%	<u>4.992%</u>
			7.007%

4

5 **Q. What is the basis for NRLP’s statement that it has a “cost of equity”**  
6 **of 9.60%?**

7 A. NRLP is not capitalized with publicly traded equity, so it does not have an  
8 actual cost of equity. NRLP asserts that it has a cost of equity equal to its  
9 proposed return on equity, on the grounds that accounting rules treat  
10 retained earnings as equity capital.<sup>5</sup> However, this reasoning is circular.

11 **Q. What is the basis for NRLP’s statement that it has a cost of debt of**  
12 **2.30%?**

13 A. NRLP’s current capital structure reflects its actual cost of debt.<sup>6</sup>

14 **Q. What is the basis for NRLP’s statement that its capital structure is**  
15 **based on a ratio of 78.3% equity to 21.7% debt?**

16 A. NRLP relies primarily on retained earnings—excess margin or profits over  
17 costs and reserves—to fund capital projects. NRLP witness Halley asserts  
18 that the 78.3% / 21.7% ratio is the actual ratio reflecting NRLP’s capital

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<sup>4</sup> *Id.* at 33, Table 6.

<sup>5</sup> *Id.* at 30:6-12.

<sup>6</sup> *Id.* at 30, table 5.

1 sources.<sup>7</sup> NRLP's actual equity to debt ratio has varied over the past ten  
2 years, with the equity fraction ranging between 77% and over 95%,<sup>8</sup> even  
3 while interest rates have generally been below 6% for the past twenty years.

4 **Q. What is NRLP's basis for recommending a 9.60% ROE?**

5 A. First, NRLP witness Halley cites<sup>9</sup> to the U.S. Supreme Court decision in  
6 *Federal Power Commission v. Hope Natural Gas*<sup>10</sup> for the proposition that  
7 "the return to the equity owner should be commensurate with returns on  
8 investments in other enterprises having corresponding risks. That return,  
9 moreover, should be sufficient to assure confidence in the financial integrity  
10 of the enterprise so as to maintain credit and attract capital."<sup>11</sup> Mr. Halley  
11 acknowledges that NRLP does not have publicly traded stock, but that  
12 NRLP's owner, ASU, must obtain capital to continue providing service.<sup>12</sup>  
13 Mr. Halley states that "NRLP should be allowed a weighted average cost of  
14 capital that includes a component at an appropriate risk-based cost of  
15 equity."<sup>13</sup> Mr. Halley states that the ROE should be set to prevent both  
16 diminishment of the retained earnings used to finance capital projects and  
17 a resulting increased reliance on debt such that NRLP's finances became  
18 "unbalanced."<sup>14</sup> Mr. Halley notes that two analytical methods are frequently

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<sup>7</sup> See Halley Direct at 30.

<sup>8</sup> NRLP - Response to PS DR 1-7 - Attachment to E1-Response 33 a-d.

<sup>9</sup> Halley Direct at 24:4-16.

<sup>10</sup> *Fed. Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

<sup>11</sup> *Id.* at 603.

<sup>12</sup> Halley Direct at 24:18-24.

<sup>13</sup> *Id.* at 25:2-3.

<sup>14</sup> *Id.* at 25:4-6.

1 used to ascertain a reasonable ROE—the DCF analysis, and the  
2 Comparable Earnings Analysis (CEA), but that he relied only on a CEA.<sup>15</sup>  
3 Mr. Halley did not perform or provide a DCF analysis in order to save an  
4 unspecified amount of time and money.<sup>16</sup>

5 **Q. Please elaborate on NRLP's CEA.**

6 A. NRLP proposes a 9.60% ROE based on a three-part CEA. In the first part,  
7 NRLP cites Commission-approved ROEs of 9.60% for two investor-owned  
8 gas distribution utilities, Piedmont Natural Gas, a business unit of Duke  
9 Energy,<sup>17</sup> and Public Service Company of North Carolina, a business unit  
10 of Dominion Energy.<sup>18</sup> NRLP's analysis effectively amounts to identifying  
11 these two companies as “distribution-only utilities.”<sup>19</sup> In the second part of  
12 the CEA, NRLP provides fifteen years of rate case statistics from S&P  
13 Global Market Intelligence to show that authorized ROEs averaged 9.38%  
14 in 2021, and have been trending downward since 2009, but that NRLP  
15 “expect[s] the allowed ROEs to end their decline downward and to now  
16 move back upward.”<sup>20</sup> In the third part, NRLP calculates average earned  
17 and expected ROEs for 34 investor-owned utility holding companies for the  
18 years 2020, 2021, 2022 (estimated), 2023 (estimated), and 2025 through

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<sup>15</sup> *Id.* at 25:13-19.

<sup>16</sup> *Id.* at 25:21 – 26:5.

<sup>17</sup> *About Piedmont Natural Gas*, PIEDMONT NATURAL GAS, <https://www.piedmontng.com/our-company/about-piedmont> (last visited May 25, 2023).

<sup>18</sup> *Natural Gas Section*, PUBLIC STAFF—NORTH CAROLINA UTILITIES COMMISSION, <https://publicstaff.nc.gov/public-staff-divisions/energy-division/natural-gas-section#> (last visited May 25, 2023).

<sup>19</sup> Halley Direct at 26:12-16.

<sup>20</sup> *Id.* at 26:20 – 28:7.

1 2027 (estimated), based on Value Line's Investment Survey.<sup>21</sup> NRLP uses  
2 the results of these analyses to derive a range within which the proposed  
3 9.60% ROE falls.<sup>22</sup>

4 **Q. What is NRLP's basis for recommending its proposed capital  
5 structure?**

6 A. NRLP recommends a capital structure of 52% equity and 48% debt, rather  
7 than its actual 78.3% equity and 21.7% debt capital structure, because the  
8 52% / 48% equity ratio is comparable to that approved for the investor-  
9 owned gas distribution utilities that NRLP proposes as benchmarks.<sup>23</sup>

10 **Q. What is NRLP's basis for recommending its proposed cost of debt?**

11 A. NRLP witness Halley recommends using the average of the costs of debt  
12 for the two investor-owned gas distribution utilities that NRLP uses as  
13 benchmarks (4.37% and 4.02%), and not NRLP's actual embedded cost of  
14 debt of 2.30% because the cost of new debt that NRLP might secure  
15 (presumably through ASU) would be higher than the actual embedded  
16 cost.<sup>24</sup> NRLP also supports the use of a hypothetical cost of debt because  
17 it has recommended a hypothetical equity to debt ratio of 52% equity to 48%  
18 debt.<sup>25</sup>

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<sup>21</sup> *Id.* at 28:9 – 29:4.

<sup>22</sup> *Id.* at 29:6 – 30:4.

<sup>23</sup> *Id.* at 31:10-14.

<sup>24</sup> *Id.* at 31:16 – 32:2.

<sup>25</sup> *Id.* at 32:4-6.

1       **II.B. NRLP's PROPOSED ROE, COST OF DEBT, ROR, AND**  
2       **CAPITAL STRUCTURE ARE UNREASONABLE AND DO**  
3       **NOT SUPPORT JUST AND REASONABLE RATES**

4       **Q.     Does the *Hope* decision provide a good starting point for determining**  
5       **a reasonable return on capital investments made by a regulated utility**  
6       **in support of the provision of utility service?**

7       A.     Yes. In my experience, the comparable risk standard from the *Bluefield* and  
8       *Hope* decisions is where this analysis should start.<sup>26</sup> Reasonable and  
9       responsible utilities provide detailed analyses of comparable utilities, often  
10      set forth through the identification of a proxy group of utilities, to identify a  
11      range of reasonableness for proposed ROEs, RORs, and capital structures.

12      **Q.     What is your assessment of NRLP's proposed capital structure,**  
13      **allowed ROE, cost of debt, allowed ROR, and the basis for those**  
14      **proposals?**

15      A.     NRLP's proposals are unreasonable and will not support just and  
16      reasonable rates.

17      **Q.     What additional analysis should NRLP have conducted to support its**  
18      **proposed rate of return and capital structure?**

19      A.     NRLP should have conducted a DCF analysis because its CEA is  
20      inadequate and prone to bias. A DCF analysis is best practice for preparing  
21      a proposal for a rate of return. A DCF analysis requires the explanation of

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<sup>26</sup> *Bluefield Water Works & Improvement Co. v. Pub. Serv. Comm'n*, 262 U.S. 679 (1923); *Fed. Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).



1 a reasonable expectation and recovery of returns on investment, properly  
2 discounted by the cost of capital. A DCF analysis would properly include  
3 assumptions about the actual cost of capital for NRLP from the least-cost  
4 source, which would be ASU-issued bonds. It would also include a  
5 reasonable level of debt-service coverage that reflected any unique and  
6 different additional business risk that NRLP and ASU face. Lastly, the  
7 stream of payments necessary to meet debt service (and collect that  
8 coverage) would need to be discounted by the average cost of capital—  
9 university debt—that ASU experiences as the source of funds.

10 **Q. What is your assessment of NRLP's basis for a proposed cost of**  
11 **equity of 9.60%?**

12 A. The proposed 9.60% cost of equity in the proposed capital structure is not  
13 cost-based, is not appropriate under the accepted standards of utility rate  
14 making and will result in customers being required to pay excessive, unjust,  
15 and unreasonable rates. Indeed, NRLP uses its ROE *request* as its cost of  
16 equity.<sup>27</sup> NRLP does not pay anyone but itself and its owner at a “profit” rate  
17 of 9.60%. NRLP does not have publicly traded stock, nor does ASU. While  
18 accounting rules treat retained earnings as equity, this does not provide any  
19 relevant evidence to support Commission approval of an allowed ROE of  
20 9.60% for a division of a state-operated, 501(c)(3) educational nonprofit  
21 institution. Moreover, there is no evidence from NRLP that the equity funds

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<sup>27</sup> NRLP response to AV DR 7-7.

1 it uses for capital projects costs NRLP or ASU anything near 9.60%. In the  
2 absence of actual data relating to equity cost, NRLP should rely on an actual  
3 cost of capital in the form of prospective, long-term debt to establish a proxy  
4 value for equity cost and for use in a DCF analysis.

5 **Q. What issues would NRLP encounter if it were allowed an ROE that was**  
6 **lower than 9.60% and based on its actual cost of capital?**

7 A. None. NRLP could secure funding support from ASU through debt at a  
8 much lower cost to customers than 9.60%. In 2022, ASU issued \$20 million  
9 in general revenue bonds to build a parking garage at a 4.06% interest  
10 rate,<sup>28</sup> and during the past 10 years, the bond rate for municipal bonds rated  
11 Baa or better has been under 5%.<sup>29</sup> On issuance of the \$20 million in bonds,  
12 Moody's Investors Service assigned an Aa3 rating to ASU, noted that the  
13 University maintains a 13.6x coverage of fiscal 2023 proforma debt  
14 service,<sup>30</sup> and generally observed that the credit rating reflects ASU's  
15 "strong regional brand as a member of the University of North Carolina  
16 System with very good student demand and growing enrollment," and that  
17 ASU's credit quality is underpinned by strong operating and capital support  
18 from the State of North Carolina.<sup>31</sup> NRLP provides no evidence that funding

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<sup>28</sup> NRLP Response to PS DR 13 Att. 11.

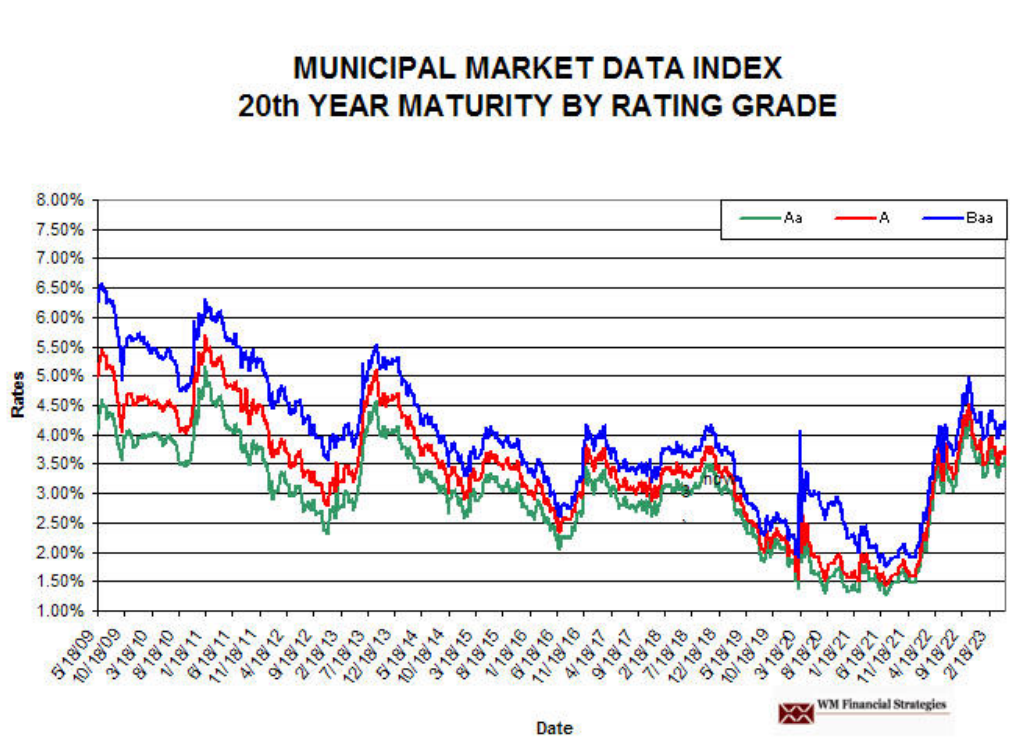
<sup>29</sup> See, e.g., *Rates over Time – Interest Rate Trends*, WM FINANCIAL STRATEGIES, <https://www.munibondadvisor.com/market.htm> (last visited May 26, 2023).

<sup>30</sup> Refers to ratio of net operating income to annual debt service.

<sup>31</sup> Moody's, Board of Governors of the University of NC -- Moody's assigns Aa3 to Appalachian State University's (NC) general revenue bonds series 2022B; outlook stable, YAHOO (Aug. 17, 2022), <https://www.yahoo.com/video/board-governors-university-nc-moodys-233106445.html>.

1 capital projects with money that costs customers twice as much, or more,  
 2 as debt is just or reasonable.

3 **Figure JWH-1: Municipal Bond Interest Rates**



4  
 5  
 6 **Q. What evidence has NRLP provided that its capital needs could not be  
 7 met with more debt and less dependence on retained earnings?**

8 **A.** NRLP has provided no evidence that its capital needs could not be satisfied  
 9 with lower-cost capital sourced from debt. NRLP has never had any  
 10 problems raising capital.<sup>32</sup> NRLP's use of retained earnings with a  
 11 hypothetical cost of equity generates excessive and unjust profits. NRLP

<sup>32</sup> NRLP response to AV DR 1-7.

1 could have saved customers substantial amounts of money by using a  
2 higher fraction of debt funding, and by using borrowed money to pay for  
3 capital projects. That is because NRLP is an operating division of a public  
4 university and has access to low-cost capital through low-risk sources,  
5 including public financing options. In addition, ASU maintaining and  
6 operating NRLP, which also has non-ASU customers, reduces the business  
7 operating risk ASU faces in managing its university operations. Finally, as  
8 a public university, ASU can apply and compete for substantial funding  
9 support from the federal government under the Inflation Reduction Act.  
10 According to NRLP, “[ASU] and NRLP have and continue to pursue  
11 numerous programs related to energy conservation, weatherization, energy  
12 storage, alternative energy, and demand side management,” are pursuing  
13 IRA funding for three new renewable energy systems and other renewable  
14 energy projects, are writing IRA-related grant applications, and are pursuing  
15 IRA section 6417 “Direct Pay” elections or tax credits, among other efforts.<sup>33</sup>  
16 These are risk- and cost-reduction opportunities that the gas utilities that  
17 NRLP chose as benchmarks do not enjoy.

18 **Q. How does a higher-than-reasonable allowed ROE impact NRLP’s**  
19 **customers?**

20 A. According to NRLP, each added basis point (1/100<sup>th</sup> of a percentage point)  
21 of ROE adds \$1,832 to the total revenue requirement when calculated using

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<sup>33</sup> NRLP responses to AV DR 7-11 through 7-13, 7-15, 7-16, 7-17 through 7-20.

1 NRLP's proposed capital structure of 52% equity and 48% debt.<sup>34</sup> My  
2 analysis shows that an ROE of 9.60% is about 335 basis points higher than  
3 reasonable, meaning that NRLP's proposed revenue requirement under its  
4 proposed capital structure is about \$613,600 higher than it should be as a  
5 result of its higher-than-reasonable proposed ROE.<sup>35</sup>

6 **Q. How does excessive reliance on retained earnings for financing**  
7 **capital projects impact NRLP's customers?**

8 A. Each additional percentage point added to the equity portion of the capital  
9 structure (and subtracted from the debt portion) increases the total revenue  
10 requirement by \$16,485, at NRLP's proposed ROE of 9.6% and proposed  
11 cost of debt of 4.2%. Given that NRLP's current actual equity fraction of  
12 78.3% is 26.3% higher than its proposed 52% equity fraction, NRLP  
13 customers would pay \$433,550 more than they would if the Commission  
14 approved a 52% equity fraction,<sup>36</sup> a fraction that even NRLP finds more  
15 reasonable than its "too high and unfair" actual capital structure.<sup>37</sup> I propose  
16 that the Commission order NRLP to develop a comprehensive financing  
17 strategy that optimizes the capital structure for the utility in light of its status  
18 as an operating unit of ASU.

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<sup>34</sup> NRLP response to AV DR 1-4.

<sup>35</sup> Calculated as  $(9.60\% - 6.25\%) = 335$  basis points.  $\$1,832$  per basis point  $\times 335$  basis points =  $\$613,600$ . This calculation was performed using my recommendations from this testimony and NRLP response to AV data request 1-4.

<sup>36</sup> Calculated as  $(78.3\% - 52.0\%) = 2,630$  basis points.  $2,630$  bp  $\times \$165 = \$433,950$ .

<sup>37</sup> Halley Direct at 30:15-17.

1 **Q. Do you have other concerns regarding NRLP's excessive reliance on**  
2 **retained earnings and higher-than-reasonable allowed ROE?**

3 A. Yes. The combination of NRLP's limited capital needs, its excessive  
4 reliance on retained earnings, and higher-than-reasonable allowed ROE  
5 have previously allowed NRLP to charge rates that included excessive  
6 returns during the period of about 20 years between general rate case  
7 filings. Between 1996 (Docket No. E-34, Sub 32) and 2017 (Docket No. E-  
8 34 Sub 46), NRLP did not file a general rate case and instead relied on the  
9 10.65% ROR and capital structure of 6.42% debt and 93.58% equity, with  
10 a cost rate of 5.62% for debt and 11.0% for common equity during those  
11 decades. Recommended Order Granting Increase in Rates at 9, ¶ 38, *In*  
12 *the Matter of Application by New River Light and Power Company for*  
13 *Authority to Adjust and Increase its Electric Rates and Charges*, Docket No.  
14 E-34, Sub 32 (N.C.U.C. May 1, 1997). The cost rate for debt and equity  
15 were significantly lower than those approved for NRLP during most of that  
16 period, which resulted in both an "earnings windfall" for NRLP as its rates  
17 of return were well-above competitive market rates and subjected NRLP  
18 customers to unjust and unreasonable rates. NRLP's excessive reliance on  
19 retained earnings and higher-than-reasonable allowed ROE presents  
20 significant risks of unjust and unreasonable rates not just in the immediate  
21 future but potentially for decades to come if NRLP elects not to file a general  
22 rate case.

1 **Q. How does NRLP's proposal to fund capital projects with retained**  
2 **earnings, an excessive equity fraction, a hypothetical 9.60% return on**  
3 **equity, and 4.20% cost of debt impact ASU in particular?**

4 A. More than 20% of NRLP's electricity sales in 2022 were to ASU.<sup>38</sup> While  
5 ASU reduces its business operating risks by owning and managing its own  
6 electric distribution utility, a considerable share of operating costs, about  
7 \$16 million, was paid to NRLP.<sup>39</sup> NRLP charges ASU the same excessive  
8 rate of return that it does other customers it serves.<sup>40</sup> NRLP also receives  
9 substantial support from ASU in terms of information technology, human  
10 resources, and legal counsel services.<sup>41</sup> Under North Carolina law, NRLP's  
11 net profits are to be transferred to the ASU Endowment Fund, and to benefit  
12 the university.<sup>42</sup> By overcharging for the cost of equity and the cost of debt,  
13 and by over-relying on equity for financing capital projects, NRLP proposes  
14 to reduce funds available for transfer to the ASU Endowment Fund as net  
15 profits, to overcharge ASU for electric service and increase the tax burden  
16 for all citizens of North Carolina, to increase the costs and fees for students,  
17 and to increase the costs for businesses and services in the ASU area.

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<sup>38</sup> NRLP response to AV DR 4-1 att.

<sup>39</sup> OFFICE OF THE STATE AUDITOR, BETH A. WOOD, CPA, ASU FINANCIAL STATEMENT AUDIT REPORT FOR THE YEAR ENDED JUNE 30, 2022, 12, Chart 2.1, <https://controller.appstate.edu/sites/default/files/2022.pdf>.

<sup>40</sup> NRLP response to AV DR 4-9.

<sup>41</sup> NRLP response to AV DR 4-3.

<sup>42</sup> N.C.G.S. § 116-35.

1 **Q. What is your assessment of NRLP's approach to developing its**  
2 **recommendation for a 9.60% ROE?**

3 A. NRLP's ROE proposal is fundamentally flawed because NRLP has failed to  
4 present substantial and persuasive evidence that supports the proposal.  
5 There are several flaws with its proposal, which are addressed below.

6 **Q. What is your assessment of NRLP's failure to perform a DCF analysis?**

7 A. NRLP's failure to perform a DCF analysis is unreasonable, especially when  
8 considered alongside NRLP's deficient CEA. NRLP's failure to perform a  
9 DCF analysis leaves the Commission with only the subjective, incomplete,  
10 and unreasonable proposal of NRLP witness Halley.<sup>43</sup>

11 **Q. What is your assessment of NRLP's selection of two gas distribution**  
12 **utilities as benchmarks for setting the proposed ROE, cost of debt,**  
13 **and equity ratio?**

14 A. NRLP's choice of two investor-owned gas distribution utilities for  
15 benchmarking its ROE proposal—Part 1 of its CEA—violates the principle  
16 that NRLP's allowed ROE should be based on indicators from utilities with  
17 comparable risk. NRLP's witness Halley states that the two investor-owned  
18 gas utilities were identified as benchmarks solely because they are also  
19 distribution-only utilities,<sup>44</sup> however there is language in his testimony that  
20 would seem to suggest that this equity fraction was used in part because of  
21 the sizeable costs customers would bear if NRLP's actual equity fraction

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<sup>43</sup> NRLP response to AV DR 4-10.

<sup>44</sup> NRLP responses to AV DR 4-11, 4-12.



1           were applied.<sup>45</sup> Even so, NRLP’s analysis overlooks important differences  
2           between the distribution gas utilities and NRLP. For example, it ignores the  
3           fact that industry and consumer trends away from reliance on fossil fuels  
4           increase risk for gas utilities but reduce risk for electric utilities. If gas  
5           customers stop using gas, the gas utility goes out of business, and electric  
6           utilities will gain heating market share. NRLP is exploring and developing  
7           supply alternatives that mitigate risks associated with the transition away  
8           from fossil fuel use. NRLP has offered no information to support its assertion  
9           that the capital spending plans for the gas utilities are comparable to those  
10          of NRLP. NRLP overlooks the fact that the gas utilities are investor-owned  
11          and not an operating division of a state-funded university with a significantly  
12          lower cost of capital. NRLP overlooks the fact that a substantial fraction of  
13          NRLP’s load is essentially captive—the university and student body.<sup>46</sup> Mr.  
14          Halley overlooks the fact that the Boone, North Carolina community has a  
15          strong vacation and skiing economy that peaks during times when the  
16          University is closed or experiencing reduced enrollment, so non-university  
17          load complements ASU load. NRLP also fails to account for the fact that  
18          ASU receives substantial support from ASU for information technology,  
19          human resources, and legal services, all of which would cost NRLP more  
20          outside the University system.<sup>47</sup>

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<sup>45</sup> See Halley Direct at 30:13-17.

<sup>46</sup> NRLP response to AV DR 4-1 att.

<sup>47</sup> NRLP response to AV DR 4-3.

1 **Q. In sum, does NRLP face comparable business risk to that of the two**  
2 **investor-owned gas utilities that it proposes as benchmarks for**  
3 **setting NRLP's allowed ROE?**

4 A. No. As illustrated by all the important differences I just discussed, simply  
5 being a distribution-only utility is not sufficient to make the gas utilities  
6 comparable to NRLP for purposes of setting its ROE.

7 **Q. What is your assessment of NRLP's reliance on S&P Global Market**  
8 **Intelligence data?**

9 A. NRLP's reliance on investor-owned utility data from S&P Global Market  
10 Intelligence—Part 2 of its CEA—also violates the principle that allowed ROE  
11 should be benchmarked against utilities with comparable risk. NRLP made  
12 no showing that the utilities in the S&P data set are comparable to NRLP.  
13 NRLP does not distinguish or otherwise characterize this data set in any  
14 useful fashion. The S&P data is not a reasonable basis for NRLP's ROE  
15 proposal.

16 **Q. What is your assessment of NRLP's proposal to deviate from the S&P**  
17 **data for 2021?**

18 A. NRLP's proposal to add 22 basis points to the most recent 2021 average  
19 ROE in the S&P dataset based on witness Halley's expectation<sup>48</sup> is  
20 unjustified. The proposal is not calibrated in any fashion and therefore  
21 provides no reasonable basis of support for NRLP's proposal. In response

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<sup>48</sup> NRLP "expect[s] the allowed ROEs to end their decline downward and to now move back upward." Halley Direct at 26:20 – 28:7.

1 to a request for additional information, NRLP cites rising interest rates and  
2 the allowed rate of return for a water utility as justification for an increased  
3 ROE for NRLP, but again fails to address how NRLP's business and  
4 financial conditions justify comparable increases.<sup>49</sup>

5 **Q. What is your assessment of NRLP's reliance on Value Line Investment**  
6 **Survey data?**

7 A. NRLP's reliance on investor-owned utility data from Value Line Investment  
8 Survey data—Part 3 of its CEA—violates the principle that allowed ROE  
9 should be benchmarked against utilities with comparable risk. The utilities  
10 included in the Value Line data are utility holding companies with publicly  
11 traded stock, multi-state operations, generation assets, and diverse  
12 regulatory climates. Many have major capital requirements for infrastructure  
13 needs, generation needs, grid modernization requirements, performance-  
14 based regulation standards, and other activities. NRLP does not distinguish  
15 or otherwise characterize this data set in any useful fashion. NRLP offers  
16 the Value Line numbers while acknowledging that a fuller analysis that is  
17 based on more recent data or provides adjustments for comparable risk is  
18 beyond the evidence produced by NRLP.<sup>50</sup> The Value Line data is not a  
19 reasonable basis for NRLP's ROE proposal.

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<sup>49</sup> NRLP response to AV DR 4-13.

<sup>50</sup> NRLP response to AV DR 4-14.

1 **Q. What is your assessment of NRLP's proposal to use a hypothetical**  
2 **cost of debt in its proposed capital structure?**

3 A. NRLP's cost of debt proposal is unreasonable. In making his  
4 recommendation, Mr. Halley relies on a simple arithmetic averaging of the  
5 approved costs of debt for the two gas distribution utilities chosen as  
6 benchmarks for his ROE proposal. As previously explained, Mr. Halley's  
7 basis for benchmarking his proposal against those two gas distribution  
8 utilities is not reasonably developed as it relies only on the unquantified  
9 assertion that NRLP and the two gas utilities are of similar size and are all  
10 distribution-only utilities. The cost of debt should not be set based on the  
11 financial characteristics of utilities with a wholly different capital structure.  
12 NRLP has actual cost of debt data supporting a 2.30% rate and should use  
13 it.

14 **Q. What is your assessment of NRLP's proposal to use a 52% / 48%**  
15 **equity to debt ratio?**

16 A. First, it is important to be clear that NRLP is not planning to finance capital  
17 projects according to a 52% / 48% equity to debt ratio.<sup>51</sup> Second, as  
18 explained by Mr. Halley, NRLP is proposing that the Commission approve  
19 a hypothetical equity to debt ratio for purposes of establishing the weighted  
20 average cost of capital that NRLP will use as a profit level in developing its  
21 rates. The lower equity fraction (proposed 52% equity fraction in

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<sup>51</sup> Halley Direct at 30:6-10.

1 comparison to the actual 78.3% equity fraction) that NRLP proposes is  
2 necessitated by the fact that NRLP proposes an excessive and unjustified  
3 ROE—if the actual equity to debt ratio is used with such a high ROE, the  
4 resulting rates would be even more unfair. NRLP fully acknowledges that it  
5 is asking the Commission to base actual rates on these hypothetical  
6 financial constructions.<sup>52</sup> A 52% equity and 48% debt capital structure does  
7 not represent NRLP's actual capital structure, and to the extent that NRLP  
8 is recommending this hypothetical capital structure, it is because of NRLP's  
9 acknowledgment that approval of its real, current capital structure, when  
10 coupled with its proposed ROE of 9.6%, would result in significantly high  
11 customer costs that would not otherwise be justified by or required under  
12 *Hope* and *Bluefield*.<sup>53</sup> While this Commission has approved the use of  
13 hypothetical capital structures as a means of containing customer costs,  
14 among other things, use of a hypothetical capital structure here, specifically  
15 for a utility that has no shareholders and has ready access to low-risk  
16 capital, in particular public financing, would not be appropriate. Use of a  
17 lower ROE and NRLP's real capital structure would reflect the current  
18 financial conditions NRLP experiences and would result in compensation  
19 that is consistent *with Hope* and *Bluefield*. The fact that Mr. Halley asserts  
20 that the proposed ratio is comparable to those approved for the two gas  
21 distribution utilities he used as benchmarks does not redeem the proposal.

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<sup>52</sup> NRLP responses to AV DR 4-15, 4-16.

<sup>53</sup> See Halley Direct at 30:13-17.

1 Again, there is not sufficient evidence that the business and financial  
2 conditions for those gas distribution utilities are in any meaningful way  
3 comparable to those under which NRLP operates.

4 **Q. Please summarize your assessment of NRLP's proposed ROE, cost of  
5 debt, ROR, and capital structure.**

6 A. NRLP has not met its burden of submitting credible evidence to support its  
7 proposals. NRLP's proposals are unreasonable and will not result in rates  
8 that are just and reasonable for its customers. The Commission should  
9 reject NRLP's proposals.

10 **II.C. RECOMMENDATIONS FOR NRLP'S ROE, COST OF DEBT,  
11 ROR, AND CAPITAL STRUCTURE**

12 **Q. Do you have recommendations for the Commission regarding NRLP's  
13 ROE, cost of debt, ROR, and capital structure that will support just and  
14 reasonable rates for electric service?**

15 A. Yes. First, the Commission should direct NRLP to move to actual, cost-  
16 based values as a basis for ROE, cost of debt, ROR, and capital structure  
17 in this case and in future cases. Second, the Commission should direct  
18 NRLP to develop a DCF analysis and develop a comprehensive financing  
19 strategy that optimizes the capital structure for the utility in light of its status  
20 as an operating unit of ASU. Third, the Commission should direct NRLP to  
21 submit a compliance filing for its ROR, based on its DCF analysis.

1 **Q. What is your recommendation for the ROE that the Commission**  
2 **should approve for NRLP?**

3 A. The Commission should approve an ROE that reflects the actual cost of  
4 obtaining capital that NRLP faces. As an operating unit of ASU, and as a  
5 utility that is not financed with traded equity, it is appropriate to look at the  
6 cost of capital ASU must pay. As previously stated, ASU has obtained some  
7 \$20 million in funds through the issuance of bonds at an interest rate of  
8 4.06%. As recent municipal bond data shows, municipal bond interest rates  
9 have recently been as high as 5%. As a conservative approach, I  
10 recommend using the 5% value as a starting point in setting the approved  
11 ROE for NRLP. However, I note that it is also reasonable to assume that  
12 NRLP's earnings should be enough to cover the cost of capital even if  
13 revenues experience some level of volatility. Therefore, I recommend that  
14 the starting point for the allowed ROE be increased by an additional 1.25%  
15 to reflect that the rate for bonds would also be adjusted to account for debt  
16 service coverage. This coverage level is identified as reasonable by  
17 Moody's Investors Service in its U.S. Municipal Utility Revenue Debt  
18 Methodology.<sup>54</sup> As a result, I find that an allowed ROE of 6.25% would be

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<sup>54</sup> MOODY'S INVESTORS SERVICE, U.S. MUNICIPAL UTILITY REVENUE DEBT METHODOLOGY 8-9 (2022), <https://ratings.moody.com/api/rmc-documents/386721#:~:text=We%20measure%20or%20estimate%20utilities,are%20sufficient%20to%20meet%20expenditures.&text=Debt%20service%20coverage%20is%20a,of%20a%20utility%20revenue%20system>.

1 reasonable and I recommend that the Commission approve 6.25% as an  
2 ROE for use in setting NRLP's weighted average cost of capital.

3 **Q. What cost of debt do you recommend that the Commission approve**  
4 **for use in setting the approved capital structure for NRLP?**

5 A. In keeping with the principle that just and reasonable rates should be based  
6 on cost of service, I recommend that the Commission authorize NRLP to  
7 use its historical embedded cost of debt of 2.30% in its capital structure and  
8 for use in developing its weighted average cost of capital.

9 **Q. What equity to debt ratio should the Commission approve for NRLP?**

10 A. North Carolina law contemplates that NRLP's net "profits" will be transferred  
11 to the Endowment Fund, so an imputed cost of equity approach is  
12 appropriate and can be reasonably implemented. NRLP's equity fraction  
13 results in rates that NRLP acknowledges would be "too high and unfair."<sup>55</sup>  
14 To the extent that the cost of equity can be expected to continue to  
15 significantly exceed the cost of long-term debt, an appropriate equity to debt  
16 ratio should be the result of a more comprehensive analysis than provided  
17 in this proceeding. As acknowledged by NRLP, a good starting point would  
18 be a 50% equity and 50% debt ratio.<sup>56</sup> Again, for purposes of setting rates  
19 in this proceeding, I recommend that the Commission approve the 78.3%  
20 equity / 21.7% long-term debt capital structure based on NRLP's actual cost  
21 of service. I further recommend that the Commission direct NRLP to

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<sup>55</sup> Halley Direct at 30:15-17.

<sup>56</sup> Halley Direct at 31:5-7.



1 develop a DCF analysis and develop a comprehensive financing strategy  
 2 that optimizes the capital structure for the utility in light of its status as an  
 3 operating unit of ASU. I anticipate that this effort will result in a more  
 4 balanced and equitable capital structure for NRLP. To ensure a timely  
 5 correction, the Commission should direct NRLP to conclude this effort within  
 6 a reasonable time frame, such as within one year after the final order in this  
 7 case is entered and submit a report to the Commission and incorporate any  
 8 proposals in its next application to change rates.

9 **Q. Based on your analysis, what do you propose as a reasonable ROR**  
 10 **for NRLP?**

11 A. I recommend an ROR of 5.39% for NRLP.

12 **Table JWH-5: Proposed ROR for NRLP**

<b>Capital Structure as Adjusted to reflect NRLP's Actual Debt, Actual Capital Structure, and a Cost of Equity of 5% Bond Interest Rate plus 125 basis points for debt service coverage</b>			
<b>Capitalization Component</b>	<b>Ratio</b>	<b>Cost</b>	<b>Weighted Cost</b>
Equity	78%	6.25%	4.89375%
Long-Term Debt	22%	2.3%	0.49910%
			5.39285%

13  
 14 **Q. What would the general benefit of these adjustments be?**

15 A. There are several benefits that would accrue from implementation of my  
 16 recommendations regarding NRLP's capital structure and rate of return:

- 1           • NRLP’s costs would be better aligned with the true cost of service,  
2           especially NRLP’s actual cost of capital.
- 3           • NRLP would have a strong incentive to optimize its capital structure to  
4           take advantage of the lower cost of capital it can obtain through ASU  
5           and the North Carolina University System.
- 6           • NRLP’s non-university residential customers would have reduced rates  
7           and bills that more accurately reflected the actual cost of service. These  
8           customers would no longer be forced to pay excessive rates solely to  
9           fund NRLP’s excessive costs and the ASU Endowment Fund.
- 10          • NRLP’s non-university business customers would also see rate and bill  
11          reductions and would be more economically competitive—as the rate  
12          and bill reductions would in turn reduce business costs, increase  
13          business profits, and grow the regional economy.
- 14          • ASU’s costs to maintain and operate the university would be reduced,  
15          also reducing costs to North Carolina taxpayers in general.

16   **Q.    Have you estimated the impact of your recommendations on NRLP’s**  
17   **revenue requirement?**

18   A.    Yes. The changes that I propose to NRLP’s capital structure, cost of debt,  
19   and ROE would result in NRLP’s capital structure reflecting the actual cost  
20   of service and would reduce the revenue requirement by a total of \$492,711  
21   systemwide, by \$151,983 for the residential class, and by \$61,427 for small  
22   commercial customers, compared to NRLP’s proposal.

1  
2 **III. Establishment of EE and DSM Programs for NRLP**  
3 **Customers**

4 **Q. Is NRLP required to develop proposals for EE and DSM programs?**

5 A. Yes. In NRLP's last rate case before the NCUC, NRLP agreed in a  
6 stipulation with the Public Staff – North Carolina Utilities Commission  
7 (Public Staff) to work to develop rate schedules and EE and DSM programs  
8 that take advantage of the detailed usage data and other capabilities of its  
9 AMI metering system. Stipulation of New River and Public Staff, ¶ 38, *In*  
10 *the Matter of Application of Appalachian State University, d/b/a New River*  
11 *Light and Power Company, for an Adjustment of Rates and Charges for*  
12 *Electric Service in North Carolina*, Docket No. E-34, Sub 46 (N.C.U.C. Jan.  
13 19, 2018). The Commission accepted the stipulation, including NRLP's  
14 agreement to develop these rate schedules and programs, recognizing that  
15 NRLP would be unable to implement EE or DSM programs until its contract  
16 with BREMCO ended, and to report on its progress to the Public Staff within  
17 180 days. Order Accepting Stipulation and Granting Increase in Rates, FOF  
18 ¶ 41, *In the Matter of Application of Appalachian State University, d/b/a New*  
19 *River Light and Power Company, for an Adjustment of Rates and Charges*  
20 *for Electric Service in North Carolina*, Docket No. E-34, Sub 46 (N.C.U.C.  
21 Mar. 29, 2018).

1 **Q. Has NRLP developed any EE/DSM programs since its last rate case?**

2 A. According to NRLP Response to AV Request 6-13 (a), NRLP has not  
3 submitted any DSM programs to the NCUC in this rate case or as part of  
4 other proceedings before the Commission. According to NRLP Response  
5 to AV Request 6-13 (e), NRLP indicated it is pursuing grant opportunities  
6 related to the following possible EE/DSM programs:

- 7 1) Heat Pump and Water Heater Rebate programs;  
8 2) EV charging infrastructure throughout NRLP territory;  
9 3) Installation of programable thermostats that may be controlled by  
10 NRLP at a customer's request.

11 **Q. Do other retail electric providers in North Carolina and elsewhere offer  
12 similar EE/DSM programs to those NRLP has identified?**

13 A. Yes, a brief list of some example EE/DSM programs that are similar to those  
14 NRLP has identified is provided in Exhibit JWH-2.

15 **Q. Do NRLP's wholesale power supply-related contract(s) prohibit or  
16 restrict its ability to offer DSM programs to its customers?**

17 A. According to NRLP Response to AV Request 6-13 (b) and (c), the  
18 Wholesale Distribution Services Agreement, dated August 2, 2021,  
19 between NRLP and Blue Ridge Electric Membership Corporation  
20 (BREMCO) does not prevent the development of energy efficiency and  
21 demand side management programs by NRLP. According to NRLP  
22 Response to AV Request 6-13 (b), pursuant to the new agreement, NRLP

1 has been able to offer energy efficiency and DSM programs to its customers  
2 since January 2022, and has been aware that it can since at least August  
3 2, 2021, when the new agreement was executed.

4 **Q. What, if any, programs did NRLP develop instead of EE/DSM programs**  
5 **since its last rate case?**

6 A. According to NRLP Response to AV Request 6-13 (b), NRLP chose to offer  
7 its customers subscriptions to the NC Green Power Program instead of EE/  
8 DSM programs.

9 **Q. Is offering customers the option of participating in the NC Green**  
10 **Power Program equivalent to or a replacement for EE/ DSM programs?**

11 A. No, offering customers the option to increase the carbon-free or renewably  
12 generated portion of their individual power supply through the NC Green  
13 Power Program does not assist or support customer efforts to reduce  
14 energy consumption or load. Energy efficiency and DSM programs target  
15 changes in customer demand and energy use, while green power programs  
16 focus on the source and characteristics of power supply.

17 **Q. What reason(s) did NRLP offer as justification for not developing any**  
18 **EE/DSM programs since its last rate case?**

19 A. In response to AV Request 6-13 (b), NRLP referenced customer interest in  
20 renewable energy indicated by the results of a 2020 customer survey, and  
21 its choice “to pursue the Green Power Program that all customers could

1 participate [in] regardless of being home owners or renters” as justification  
2 for why no EE/ DSM programs have been proposed since its last rate case.

3 **Q. How does NRLP’s mix of residential customers, including the**  
4 **proportions of homeowners and renters, compare to that of North**  
5 **Carolina?**

6 A. Using the Town of Boone, North Carolina as a proxy for NRLP’s service  
7 area, recent data<sup>57</sup> from the United States Census Bureau show that owner-  
8 occupied housing units account for only 23.4% of total housing units in the  
9 NRLP service area, while owner-occupied housing units represent 65.9%  
10 of total housing units in North Carolina statewide. According to a recent  
11 study conducted for the Town of Boone, the number of renter-occupied  
12 housing units in NRLP’s service territory is also growing rapidly. Between  
13 2009 and 2019, the number of housing units increased by nearly 20% from  
14 less than 5,700 to about 6,800.<sup>58</sup>

15 Residential mobility in the NRLP service area is also much higher  
16 than that of the state at large, with only 46.7% of people living in the same  
17 residence as the previous year in NRLP’s service territory compared to  
18 85.9% of people statewide who lived in the same residence as of one year

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<sup>57</sup> *QuickFacts Boone town, North Carolina*, UNITED STATES CENSUS BUREAU, <https://www.census.gov/quickfacts/boonetownnorthcarolina> (last visited June 6, 2023); *QuickFacts North Carolina; United States*, UNITED STATES CENSUS BUREAU, <https://www.census.gov/quickfacts/fact/table/NC,US/PST045222> (last visited June 6, 2023).

<sup>58</sup> EVE LETTAU AND JESSICA WILKINSON, HOUSING AND BUSINESS RESILIENCY IN BOONE, NORTH CAROLINA, NC GROWTH, NOVEMBER 2021, <http://www.townofboone.net/DocumentCenter/View/1336/Housing-and-Business-Resiliency-in-Boone-NC-November-2021-PDF> (REPORT ON HOUSING AND BUSINESS RESILIENCY IN BOONE).

1 ago.<sup>59</sup> Annual per capita income and median household income in the  
2 NRLP service area are about 41% of the statewide averages.<sup>60</sup>

3 Overall, residential customers in NRLP's service area have  
4 significantly less income than statewide average levels, occupy rental  
5 housing units at 2.8 times the rate of rentals statewide, and tend to change  
6 residences from one year to the next at 1.8 times the statewide average  
7 rate. These differences in residential characteristics reflect the large share  
8 of college and university students living in NRLP's service territory. Annual  
9 student enrollment at ASU is over 20,000 students<sup>61</sup> while the Town of  
10 Boone's latest population estimate<sup>62</sup> from July 1, 2022 is 19,756.

11 **Q. Do these differences in residential customer characteristics reduce**  
12 **the importance of NRLP developing energy efficiency or DSM**  
13 **programs?**

14 A. No, in fact, the comparatively high proportion of NRLP customers who are  
15 renters and who have incomes well below state average income levels  
16 mean that energy efficiency and DSM programs would likely have even  
17 greater beneficial impacts on electricity customers in NRLP's service

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<sup>59</sup> *QuickFacts Boone town, North Carolina*, UNITED STATES CENSUS BUREAU, <https://www.census.gov/quickfacts/boonetownnorthcarolina> (last visited June 6, 2023); *QuickFacts North Carolina; United States*, UNITED STATES CENSUS BUREAU, <https://www.census.gov/quickfacts/fact/table/NC,US/PST045222> (last visited June 6, 2023).

<sup>60</sup> *Id.*

<sup>61</sup> *Institution(s): All, Enrollment Measure: Student Count*, UNIVERSITY OF NORTH CAROLINA, [https://myinsight.northcarolina.edu/t/Public/views/db\\_enroll/EnrollmentbyLevel?iid=1&%3AisGuestR%20edirectFromVizportal=y&%3Aembed=y](https://myinsight.northcarolina.edu/t/Public/views/db_enroll/EnrollmentbyLevel?iid=1&%3AisGuestR%20edirectFromVizportal=y&%3Aembed=y) (last visited June 6, 2023).

<sup>62</sup> *QuickFacts Boone town, North Carolina*, UNITED STATES CENSUS BUREAU, <https://www.census.gov/quickfacts/boonetownnorthcarolina> (last visited June 6, 2023).

1 territory than in other parts of the state. Energy efficiency and DSM  
2 programs benefit customers by reducing energy costs, reducing the energy  
3 burden on household finances, improving health and comfort, reducing  
4 greenhouse gasses and other air emissions, and increasing the resiliency  
5 of NRLP's electric service. Energy efficiency and DSM programs offer the  
6 potential for NRLP to reduce costs for all customers by reducing peak loads  
7 and overall energy consumption.

8 **Q. What are some implications of the unique characteristics of residential**  
9 **customers in the NRLP service area for EE/DSM programs?**

10 A. Residential customer characteristics in the NRLP service territory have  
11 several implications for the design and implementation of EE/ DSM  
12 programs.

13 First, about 75% of housing units in the NRLP service area are rental  
14 housing units, most of which are occupied by ASU students.<sup>63</sup> The NRLP  
15 service territory is somewhat unique in that the share of *renter*-occupied  
16 housing units is actually 10% higher than the statewide average share of  
17 *owner*-occupied housing, so any NRLP EE/DSM programs targeting renter-  
18 occupied housing would be available to a larger share of all residential  
19 customers in NRLP service territory than most EE/DSM programs targeting  
20 single-family housing in other utility territories.

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<sup>63</sup> REPORT ON HOUSING AND BUSINESS RESILIENCY IN BOONE.



1           Second, the nature of renter-occupied multi-family housing further  
2 enhances opportunities to leverage economies of scale because multiple  
3 housing units of this type are typically owned or controlled by a single  
4 owner/entity; multiple housing units of this type are part of the same building  
5 structure and are typically built at the same time using the same methods  
6 and materials; and any physical modifications to the building structure,  
7 envelope, fixtures, or appliances could be undertaken in a large or bulk-type  
8 contract rather than on a one-off basis. For purposes of EE/DSM program  
9 planning, benchmarking<sup>64</sup> is a method of evaluating and comparing the  
10 energy use of a building to other buildings to gain insight into the market  
11 potential of EE/DSM programs. Using benchmarking techniques to develop  
12 and evaluate potential EE/DSM programs would enable NRLP to identify,  
13 prioritize, and pursue EE/DSM opportunities appropriate to the mix of  
14 residential housing units in its service territory.

15           Third, the large number of NRLP customers and electricity  
16 consumers affiliated with ASU combined with the ability to reach these  
17 consumers with relative ease by using existing university-based  
18 communication channels suggests that energy consumption/peak load  
19 reductions from the use of behavior-based EE/DSM programs are more

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<sup>64</sup> Benchmarking entails assessing a building's energy usage over time and comparing that building's energy usage with its peers. ANDREW SCHULTE ET AL., AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY (ACEEE), LEVERAGING DSM PROGRAMS TO DELIVER ON THE PROMISE OF BENCHMARKING AND DISCLOSURE POLICIES 7-1 (2016), [https://www.aceee.org/files/proceedings/2016/data/papers/7\\_151.pdf](https://www.aceee.org/files/proceedings/2016/data/papers/7_151.pdf).

1 feasible for NRLP than other electric utilities because such a high share of  
2 electricity consumers in NRLP's service territory are connected to the same  
3 community asset (i.e., ASU). Such behavior-based programs are made  
4 possible by a combination of AMI deployment and the utility's ease of  
5 access to a large number of consumers and could capitalize on existing  
6 common networks within the community to inform not just NRLP customers  
7 but also the much-larger population of electricity consumers active within its  
8 territory to provide information about peak load conditions/forecasts and  
9 actions electricity consumers could take to reduce peak load.

10 Fourth, the high share of renters and high levels of residential  
11 mobility within the NRLP service territory indicates a large portion of NRLP  
12 residential customers routinely change residences. This characteristic  
13 exacerbates common challenges to the design of EE/DSM programs,  
14 including but not limited to, the issue of split incentives and the potential for  
15 stranded EE/DSM program assets.

16 Split incentives occur when the person making the investment is not  
17 the same person who primarily benefits from the investment, such as the  
18 case between a property owner who would invest in higher efficiency  
19 appliances or building envelope upgrades (i.e., more efficient windows,  
20 insulation, etc.) and rental tenants who benefit from these improvements  
21 through reduced electricity bills. Generally, approaches to mitigating the  
22 challenge of split incentives and the resulting reduced participation in

1 EE/DSM programs involve methods that share the costs or benefits,  
2 effectively “unsplitting” the incentives to the extent possible, or highlighting  
3 other sources of benefits that, while valuable, may not be as obvious as  
4 energy cost savings. A highly mobile customer base means that tenants are  
5 routinely seeking and making comparisons among potential new  
6 residences. EE/DSM programs that provided a means for property owners  
7 to enhance the marketing and potentially the monthly rental fee of properties  
8 based on tenant energy savings and improved comfort, etc. would be one  
9 option for “unsplitting” incentives in an area with a highly mobile residential  
10 population.

11 Another implication related to high residential mobility is the risk that  
12 devices or equipment provided by the utility enabling participation in an  
13 EE/DSM program may become a stranded investment if the next  
14 tenant/NRLP customer who occupies the residential unit declined to  
15 participate. This risk can be mitigated through aspects of program design,  
16 such as using an incentivized EE/DSM default rate or rate rider for accounts  
17 located in residential units where programmable thermostats have been  
18 installed, working with property owners/managers to require participation in  
19 the programmable thermostat program as part of the lease agreement, and  
20 incorporating this option as part of a rental property marketing.

1 **Q. What is your opinion of the possible EE/DSM programs for which**  
2 **NRLP has indicated it is pursuing grant opportunities?**

3 A. NRLP indicated it is pursuing grant opportunities related to the following  
4 possible EE/DSM programs: 1) heat pump and water heater rebate  
5 programs; 2) EV charging infrastructure throughout NRLP territory; and 3)  
6 installation of programmable thermostats that may be controlled by NRLP at  
7 a customer's request. In general, EE/DSM programs of the type NRLP listed  
8 can be effective at reducing energy consumption and peak load, and I am  
9 supportive of the general concept of these types of EE/DSM programs.  
10 However, without additional details on program design; incentive levels;  
11 expected savings; expected program costs; program evaluation,  
12 measurement, and verification (EM&V) plans; and the participation potential  
13 of NRLP's residential customers, etc., I am not able to evaluate the possible  
14 EE/DSM programs NRLP has listed and reach a firm conclusion regarding  
15 any specific programs.

16 **Q. What additional EE/DSM program planning by NRLP do you think is**  
17 **necessary and why?**

18 A. To begin with, I am appreciative and supportive of NRLP's efforts to pursue  
19 grant opportunities in the development of some possible EE/DSM  
20 programs, particularly considering that NRLP is a small utility with little  
21 experience in this area because of its previous wholesale supply contracts  
22 which effectively prevented the development of these types of programs.

1 Planning is an important and necessary step in the development of EE/DSM  
2 programs. A basic EE/DSM program plan that does the following would  
3 provide valuable information:

- 4 • Establishes the overall goals for a utility's EE/DSM efforts;
- 5 • Sets forth guiding principles for the utility's portfolio of EE/DSM  
6 programs (e.g., low-income assistance targets, share of programs  
7 focused on single-family or multi-family residential units, the role of  
8 stakeholders like customers, property owners, installers, other EE  
9 program providers in program development and design);
- 10 • Characterizes and benchmarks the residential sector in the utility's  
11 territory based on pertinent building attributes (e.g., residential units with  
12 electric heating, residential units with HVAC systems, residential units  
13 constructed before recent energy efficiency additions to building codes);
- 14 • Evaluates a variety of EE/DSM program options to compare potential  
15 participation rates, potential energy savings, expected program costs,  
16 etc.;
- 17 • Defines the EM&V process and program review standards; and
- 18 • Provides a timeline with specific milestones for program design,  
19 development, review, and modifications.

20 A foundational plan such as this would allow comparisons between EE/DSM  
21 program options, provide information about the scope and reach of EE/DSM  
22 programs, allow specific program options to be considered in the context of

1 both NRLP's customer base and the full portfolio of NRLP's program  
2 offerings, and serve as a reference to guide the ongoing process of EE/DSM  
3 portfolio and program design, development, implementation, and  
4 evaluation.

5 **Q. What are your recommendations regarding NRLP's development and**  
6 **implementation of EE/ DSM programs?**

7 A. My recommendations are as follows:

8 1) NRLP should formally propose the three EE/DSM programs it has  
9 already identified and listed, guided by the program designs discussed in  
10 Exhibit JWH-2, as pilot programs of limited duration.

11 2) NRLP should prepare and file an EE/DSM plan that addresses the topics  
12 identified herein and that specifically includes a market evaluation, an  
13 evaluation of multiple EE/DSM program options, an EM&V plan (that would  
14 apply to the pilot programs at a minimum, and ideally to other future  
15 programs as well), and a clear timeline with milestones for program  
16 development. NRLP should develop the EE/DSM plan concurrently with the  
17 pilot EE/DSM offerings discussed above and use the plan and the results  
18 of the pilots to develop permanent offerings at the end of the pilot period.

19 3) As a complement to the three programs discussed above, NRLP should  
20 develop a behavior-based DSM program that allows NRLP to communicate  
21 with customers as a means of reducing NRLP load during times of grid  
22 stress and during coincident peak hours. The communications could,

1 among other things, inform customers about the three programs discussed  
2 above. For maximum effect, given the high proportion of students in  
3 NRLP's service territory, the program should be available to all electricity  
4 consumers in NRLP's service territory and not restricted exclusively to  
5 NRLP customers. NRLP should develop this as a pilot program as well and  
6 evaluate its effectiveness along with the other three pilot programs at the  
7 end of the pilot period.

8 4) NRLP should consider adding a program focused on weatherization and  
9 building retrofits/upgrades, particularly for older less-energy efficient  
10 residential units.

#### 11 **IV. Concluding Remarks and Summarized** 12 **Recommendations**

13 **Q. Please summarize your recommendations to the Commission**  
14 **regarding NRLP's proposals relating to ROR, ROE, cost of equity, cost**  
15 **of long-term debt, and capital structure.**

16 **A.** In summary, NRLP is a division of a state-operated non-profit educational  
17 institution and its allowed ROE and ROR should reflect this fact. As NRLP  
18 has acknowledged, its actual capital structure is overweighted towards  
19 equity, but NRLP's proposal to adopt a hypothetical capital structure that  
20 more closely resembles a capital structure typical of a publicly traded utility  
21 does not alter the fundamental differences between NRLP as a division of  
22

1 a state-operated non-profit educational institution and a utility with publicly  
2 traded equity and does not justify a comparable ROE to that of a utility with  
3 publicly traded equity. My proposal is based on NRLP's actual capital  
4 structure, recommends NRLP develop a DCF analysis and a  
5 comprehensive financing strategy to optimize its capital structure,  
6 recommends use of NRLP's actual cost of debt, and recommends an ROE  
7 that reflects NRLP's actual cost of obtaining new capital plus a premium  
8 based on debt service coverage.

9 My recommendations are as follows:

- 10 • The Commission should direct NRLP to move to actual, cost-based  
11 values as a basis for ROE, cost of debt, ROR, and capital structure in  
12 this case and in future cases.
- 13 • The Commission should direct NRLP to develop a DCF analysis and  
14 develop a comprehensive financing strategy that optimizes the capital  
15 structure for the utility considering its status as an operating unit of ASU.
- 16 • The Commission should direct NRLP to submit a compliance filing  
17 following the completion of its DCF analysis that reflects recalculated  
18 ROR and capital structure.
- 19 • The Commission should approve an ROE that reflects the actual cost of  
20 obtaining capital that NRLP faces. I recommend using the 5% value as  
21 a starting point in setting the approved ROE for NRLP and that the  
22 starting point for the allowed ROE be increased by an additional 1.25%



1 to reflect that the rate for bonds would also be adjusted to account for  
2 debt service coverage. Accordingly, I recommend that the Commission  
3 approve 6.25% as an ROE for use in setting NRLP's weighted average  
4 cost of capital.

- 5 • I recommend that the Commission authorize NRLP to use its historical  
6 embedded cost of debt of 2.30% in its capital structure and for use in  
7 developing its weighted average cost of capital.
- 8 • I recommend that the Commission approve the 78.3% equity / 21.7%  
9 long-term debt capital structure based on NRLP's actual cost of service.
- 10 • I recommend an ROR of 5.39% for NRLP.

11 **Q. Please summarize your recommendations to the Commission**  
12 **regarding the establishment of EE/DSM programs by NRLP.**

13 A. My recommendations are as follows:

- 14 • NRLP should formally propose the three EE/DSM programs it has  
15 already identified and listed, guided by the program designs discussed  
16 in Exhibit JWH-2, as pilot programs of limited duration.
- 17 • NRLP should prepare and file an EE/DSM plan that addresses the topics  
18 identified herein and that specifically includes a market evaluation, an  
19 evaluation of multiple EE/DSM program options, an EM&V plan (that  
20 would apply to the pilot programs at a minimum, and ideally to other  
21 future programs as well), and a clear timeline for program development  
22 milestones. NRLP should develop the EE/DSM plan concurrently with

1 the pilot EE/DSM offerings discussed above and use the plan and the  
2 results of the pilots to develop permanent offerings at the end of the pilot  
3 period.

4 • As a complement to the three programs discussed above, NRLP should  
5 develop a behavior-based DSM program that allows NRLP to  
6 communicate with customers as a means of reducing NRLP load during  
7 times of grid stress and during coincident peak hours. The  
8 communications could, among other things, inform customers about the  
9 three programs discussed above. For maximum effect, given the high  
10 proportion of students in NRLP's service territory, the program should  
11 be available to all electricity consumers in NRLP's service territory and  
12 not restricted exclusively to NRLP customers. NRLP should develop this  
13 as a pilot program as well and evaluate its effectiveness along with the  
14 other three pilot programs at the end of the pilot period.

15 • NRLP should consider adding a program focused on weatherization and  
16 building retrofits/upgrades, particularly for older less-energy efficient  
17 residential units.

18 **Q. Does this conclude your testimony?**

19 **A. Yes.**

CERTIFICATE OF SERVICE

I certify that the parties of record on the service list have been served with the Direct Testimony of Jason W. Hoyle on behalf of Appalachian Voices either by electronic mail or by deposit in the U.S. Mail, postage prepaid.

This the 6th day of June, 2023.

s/ Nick Jimenez  
Nick Jimenez



## JASON W. HOYLE

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### EDUCATION

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**Master of Business Administration**, August 2003  
Appalachian State University, Boone, North Carolina

**Bachelor of Science in Mass Communications**, May 2001  
Concentration: Print Journalism  
Appalachian State University, Boone, North Carolina

### EXPERIENCE

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**Principal Energy Policy Analyst** March 2022 – Present  
*EQ Research, LLC* | Cary, North Carolina

- Lead consulting engagements for clean and distributed energy sector clients, including writing reports, conducting research and analysis on state energy policy and market issues, and supporting regulatory and legislative advocacy.
- Manage EQ Research's services tracking U.S. electric utility rate cases, including reviewing and analyzing electric rate cases and managing subscriber-facing database.
- Research, track, and summarize state-, regional-, and national-level regulatory and legislative energy policy developments for EQ Research's policy tracking services.
- Coordinate EQ Research's regulatory and compliance consulting services for Community Choice Aggregation programs in California, including regulatory monitoring and analysis, compliance reporting, litigation support, and resource procurement planning.

**Instructor** August 2012 – December 2021

*Department of Sustainable Technology and the Built Environment, Appalachian State University* | Boone, North Carolina

- Developed undergraduate- and graduate-level course curriculum in the sustainable technology program focused on the policy, market, and economic context for the development of energy projects. Specific course topics included regulatory oversight roles, energy and related environmental attribute markets, power purchase agreements, tax-based and other incentives, and implications of emerging technologies and business models in power markets.

**Senior Research Associate** January 2020 – January 2021

**Research Associate** January 2010 – January 2020

*Center for Economic Research & Policy Analysis, Appalachian State University* | Boone, North Carolina

- Led development and implementation of research proposals on topics of electricity and emissions markets and regulation, ecosystem valuation, and economic development.
- Oversaw and supervised collection and analysis of energy and economic data for research projects, reports to legislative commissions and committees, and expert witness testimony.
- Managed development and implementation of process for obtaining customer consent and anonymization of electric utility customer data in partnership with electric utilities for energy-related behavioral economics experiments.

**Research Analyst** August 2005 – January 2020

**Research Associate** August 2003 – August 2005

*Appalachian Energy Center, Appalachian State University* | Boone, North Carolina

- Managed development and implementation of research and program initiatives on state- and national-level energy policy and regulations, including renewable energy incentives, retail rate design and analysis, wholesale electricity markets, greenhouse gas emission and carbon offset markets, sustainability accounting, and greenhouse gas inventories.
- Oversaw and led consultation services for clients from government, industry, academia, and non-profit sectors on energy- and greenhouse gas-related policies, including due diligence, legal and regulatory analysis, pro forma financial and valuation analysis, and negotiated PPA contracts and contracts for the sale of both carbon offsets and renewable energy certificates.
- Developed curriculum for and taught professional continuing education courses on renewable energy policy, finance, and regulation offering AIA Learning Units (LU), engineering Professional Development Hours (PDH), CPA (CPE) credits, Continuing Legal Education (CLE) credits, SWANA Continuing Education Units (CEU), and Continuing Forestry Education (CFE) credits.

**SELECTED SERVICE & AFFILIATIONS**

Scientific Peer Reviewer, Landfill Gas Destruction and Beneficial Use Projects v2.0, American Carbon Registry (2020-2021)

- Reviewed proposed methodology update to landfill gas project protocol (Landfill Gas Destruction and Beneficial Use Projects v2.0) for adherence to commonly accepted carbon offset principles.
- Provided comments and feedback to maximize practical usefulness and conformance with carbon accounting principles of proposed methodology update.

Workgroup Member, Landfill Project Protocol Version 5.0, Climate Action Reserve (2018-2019)

- Reviewed and advised Climate Action Reserve on proposed changes to U.S. Landfill Project Protocol Version 5.0.
- Provided information and guidance on economic, financial, and market factors used in establishing the protocol's Performance Standard Analysis (i.e. basis for differentiating between common practice and eligible project activities).

Graduate Faculty, Department of Sustainable Technology and the Built Environment, Appalachian State University (2014 – Dec. 2021)

Graduate and Honors Thesis Committees, Department of Sustainable Technology and the Built Environment, Appalachian State University (2015 - 2019)

Advisory Council, International Hydrail Conference (since 2005)

- Coordinated with conference hosts (from North America, Europe, and Asia) on conference planning, logistics, and promotion.
- Reviewed proposed presentation and provided recommendations on conference agenda and proposal acceptance.
- Compiled data and information on worldwide development and deployment of hydrogen-based rail technology, and advised government, industry, and academia on technology, policy, and deployment topics related to hydrogen trains and the broader hydrogen economy.

Advisory Board, N.C. Farm Center for Innovation and Sustainability (2009-2014)

- Advised on program development and greenhouse gas offset project opportunities (specifically carbon offsets from forestry and biochar).

- Prepared market analysis of biochar products and carbon offsets from biochar.
- Conducted operations analysis of mobile biochar production technology with focus on labor cost function and maximizing equipment capacity utilization.

Advisory Board, Western N.C. Clean Energy Leadership Group (2009-2012)

Advisory Board, N.C. Green Business Fund (2007-2009)

- Advised on design and review of Request for Proposals for new state investment fund focused on supporting development of businesses engaged in sustainable technology.
- Evaluated proposals for funding and presented evaluation to grantmaking committee.
- Participated as member of the grantmaking committee to prioritize grant proposals and select proposals for funding.

## SELECTED PUBLICATIONS & PRESENTATIONS

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### Books, Articles & Reports

"Measuring the Economic Impact of COVID-19-Related Business Interruptions on the Regional Economy" (with O. Ashton Morgan) *N.C. Policy Collaboratory*. Report. December 2020. Chapel Hill, N.C.

"Trash to Treasure: Predicting Landfill Gas Flow to Optimize Electricity Generation." (with Dan Emery, Edgar Hassler, Joseph Cazier) *JISAR*, 13(3), 29. (2020)

"Optimizing sequestered carbon in forest offset programs: balancing accounting stringency and participation." (with Wise, L., Marland, E., Marland, G., Kowalczyk, T., Ruseva, T., Colby, J. & Kinlaw, T.) *Carbon balance and management*, 14(1), 1-11. (2019)

"Trash to Treasure: Predicting Landfill Gas Flow to Optimize Electricity Generation" (with Dan Emery, Edgar Hassler, Joseph Cazier) *Conference on Information Systems Applied Research*. Conference Paper. Nov. 6-9, 2019. Cleveland, Ohio.

"Small-Scale Landfill Gas Offset Protocol" (with S. Steury and J. Dees) Appalachian State University. 2017.

*Understanding and Analysis: The California Air Resources Board Forest Offset Protocol*. (with Eric Marland, Grant Domke, Gregg Marland, Laurel Bates, Alex Helms, Benjamin Jones, Tamara Kowalczyk, Tatyana B Ruseva, Celina Szymanski) Springer Briefs in Environmental Science, 2017.

"Accounting for harvested wood products in a forest offset program: Lessons from California" (with L. Bates, B. Jones, E. Marland, G. Marland, T. Ruseva, and T. Kowalczyk) *Journal of Forest Economics* 27 (2017): 50-59.

"Additionality and permanence standards in California's Forest Offset Protocol: A review of project and program level implications" (with T. Ruseva, E. Marland, C. Szymanski, J. Hoyle, G. Marland, T. Kowalczyk) *Journal of Environmental Management* 198 (2017): 277-288.

"UNC Wilmington Greenhouse Gas Inventory and Sustainability Action Plan" (with D. Ponder, A. Toney and J. Mosteller) report to UNC-Wilmington. August 2014.

“Summary of Avoided Cost Rates & N.C. Utility Commission Proceedings Update” report to Appalachian Institute for Renewable Energy, Doc. No. 12-0194\_006. July 2013.

“Value from Solid Waste Management” report to Board of Commissioners, Rockingham County, NC. March 2013.

“Performance-based potential for residential energy efficiency” *CICERO Report*. January 2013.

“Behind-the-Meter Sale of Unbundled RECs” report to Appalachian Institute for Renewable Energy, Doc. No. 12-0194\_002. May 2012.

“Energy Internships in North Carolina: An Evaluation of Experiences and Indicators for the Future” (with M. Hoepful and L. Murphy) report to State Energy Office, N.C. Department of Commerce. April 2012.

“Electricity Sales & Generating Facility Leases in North Carolina” report to Appalachian Institute for Renewable Energy, Doc. No. 12-0194\_001. February 2012.

“Standard Purchase Offers for Power & Environmental Assets in North Carolina” Appalachian Energy Center Report. October 2011.

“Comments on Proposed Changes to the Climate Action Reserve Landfill Project Protocol” submitted to Climate Action Reserve. June 2011.

“Monetizing Green Assets & Incentives: Watauga County, NC” report to Board of Commissioners, Watauga County, NC. January 2011.

“Electricity Service Options at the Watauga County Landfill” report to Board of Commissioners, Watauga County, NC. August 2010.

“Retail Carbon Offset Survey 2009” (with J. Little, T. Cherry, H. Whalan and D. Six) report to Environmental Credit Corporation. May 2010.

“Expectations in an Uncertain Economy” (with T. Cherry and B. Toney) Center for Economic Research and Policy Analysis Research Report, March 2010.

“Landfill Gas Project Financial Analysis: Edgecombe County” report to Board of Commissioners, Edgecombe County, NC. March 2010.

“Landfill Gas Financial Analysis: Rutherford County” report to Board of Commissioners, Rutherford County, NC. March 2010.

*Secondary Economic Impact Analysis of Greenhouse Gas Mitigation Options for North Carolina*. (with D. Ponder and J. Tiller) report to North Carolina Climate Action Plan Advisory Group. Center for Climate Strategies. October 2008.

“Aspects of Energy Use and Capacity in North Carolina” (with D. Grady). *Popular Government*. Vol. 73, No. 3, pp. 5,6,10-11,22-23. 29-30. Spring Summer 2008.



## Presentations

“Community engagement strategies for capturing co-benefits from offset projects” Achieving Corporate Climate Ambitions with Carbon Offsets, Climate Action Reserve Webinar. 8 November 2018.

“Accounting for negative CO2 emissions” (with Marland, E., Marland, G., Kowalczyk, T., Ruseva, T., and Wise, L.). International Conference on Negative CO2 Emissions, Gothenburg, Sweden 22-24 May, 2018.

“Negative Electricity Prices” RECONNECT 2017. Department of Mathematics, Appalachian State University, Boone, NC. June 2017.

“Third Party Ownership Structures and Net Metering Considerations” North Carolina State Energy Conference. NC State University, Raleigh, NC. 20-21 April 2016.

“Investigating the Economic Viability of a Solid Waste-To-Biofuel Facility in Western North Carolina” (with G. Rockwell, L. Preston, C. North, J. Ferrell, J. Ramsdell, A. Morgan and M. McKee) Invited Lecture and Poster Presentation, NC Department of Agriculture Bioenergy Field Day, Mills River, N.C. 27 August 2015.

“Renewable Energy & Energy Efficiency in Commercial Construction” Construction Professionals Network of North Carolina, Mid-Year Educational Conference. Greensboro Marriott Downtown Hotel, Greensboro, NC. 3 Oct. 2014. Invited Presentation. (offering CEU credits)

“Energy, Economy and Environmental Policy: Balancing Need and Constraint” UNC-Charlotte Lecture Series. University of North Carolina at Charlotte, Department of Civil Engineering, Charlotte, NC. 10 Sep. 2014. Invited lecture.

“Negative Marginal Cost Electricity: An opportunity for low-cost value-added hydrogen production” 8<sup>th</sup> International Hydrail Conference, Ryerson University, Toronto, Canada. June 2013.

“Watauga County, NC: 195 kW or Bust” 16<sup>th</sup> Annual Landfill Methane Outreach Program, U.S. Environmental Protection Agency. Baltimore, MD, USA. January 2013.

“Economic Valuation Methods for Public Investment in Hydrail” 7<sup>th</sup> International Hydrail Conference, University of Birmingham, Birmingham, U.K. July 2012.

“State Energy Internship Program Evaluation” (with M. Hoepful) 9<sup>th</sup> Annual Sustainable Energy Conference, State Energy Office, N.C. Department of Commerce. Raleigh, NC, USA. April 2012.

“Facilitating Statewide Community-Based LFG: 6 years, 14 counties, and 10 projects” 15<sup>th</sup> Annual Landfill Methane Outreach Program Conference, U.S. Environmental Protection Agency. Baltimore, MD, USA. January 2012.

“The Value of Hydrail” 6<sup>th</sup> International Hydrail Conference, Istanbul, Turkey. July 2010.

“Carbon Credit Purchasing in the Local Decision Context” 13<sup>th</sup> Annual Landfill Methane Outreach Program Conference, U.S. Environmental Protection Agency. Baltimore, MD, USA. January 2010.

“North Carolina Economic and Energy Outlook for Local Governance” (with T. Cherry) presentation to NCAPA Summer Planning Institute. May 2009.

“New Renewable Energy Markets for North Carolina Companies” 6<sup>th</sup> Annual North Carolina Sustainable Energy Conference, State Energy Office, N.C. Department of Commerce. Raleigh, NC, USA. April 2009.

“Competitive Insight into the Energy Economy: Charlotte Region” invited lecture at Central Piedmont Community College, Charlotte, NC. November 2008.

“Accelerating Development of the Renewable Energy Economy” Workforce Partnership Conference, N.C. Department of Commerce. Greensboro, NC, USA. October 2008.

“Market Adoption Factors of Hydrail Technology” 4<sup>th</sup> International Hydrail Conference, Valencia, Spain. June 2008.

“Economic Development from Landfill Gas: Carbon Credits Facilitate Job Creation” 11<sup>th</sup> Annual Landfill Methane Outreach Program Conference, U.S. Environmental Protection Agency. Baltimore, MD, USA. January 2008.

“Utilization of Rockingham County Landfill Energy Source” (with D. Grady) presentation to Board of Commissioners, Rockingham County, NC. August 2007.

“Landfill Gas Taskforce Update” presentation to Board of Commissioners, Columbus County, NC. May 2007.

“North Carolina Opportunities in Renewable Energy Manufacturing” presentation series to AdvantageWest, Research Triangle, NC Southeast, NC Northeast, and Charlotte Economic Development Partnerships. 2005.

## **SELECTED GRANT & CONTRACT AWARDS**

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“Measuring the Economic Impact of COVID-19 on the Regional Economy” N.C. Policy Collaboratory. \$97,850. 2020 (Co-PI)

“Exploring the Viability of Small-Scale Forest Carbon Offsets” UNC General Administration Inter-Institutional Planning Grant. \$75,000. 2018 (Co-PI)

“The OFFSET Workshop: Offsets for Future Forest Stewardship & Education Together” The Clabough Foundation. \$6,610. 2017 (Investigator)

“Curriculum Development Contract TEC 3533/5533” College of Fine & Applied Arts, Appalachian State University. \$3,200. 2017 (PI)

“Biogas as Local Economic Engine and Agent for Social Change” Eastern Research Group. \$20,154. 2017 (Investigator)

“North Carolina Integrated Electric Utility Research Laboratory” (with J. Ramsdell, T. Cherry, B. Raichle, E. Miller and D. Young) UNC General Administration Research Opportunities Initiative Planning Grant. \$48,307. 2016 (Co-PI)

“Appalachian Energy Center State Appropriation - FY16 and FY17” NC Department of Environmental Quality. \$337,953. 2016 (Investigator)

- “Examining metrics in compliance carbon offset protocols in U.S. forest projects” USDA NRE US Forest Service. \$20,000. 2015 (Investigator)
- “Subcontract for UNCW Greenhouse Gas Inventory” Good Company (Hinrichs, Proudfoot, and Skov, Inc). \$5,928. 2014 (PI)
- “Examining metrics in compliance carbon offset protocols in U.S. forest projects” USDA NRE US Forest Service. \$40,000. 2014 (Investigator)
- “Appalachian Energy Center - North Carolina University Energy Center Program July 1, 2013 through June 30, 2015” N.C. Department of Environment and Natural Resources. \$506,930. 2014 (Investigator)
- “Investigating the Economic Viability of a Municipal Solid Waste-to-Biofuels Facility in WNC” (with J. Ramsdell, A. Morgan, J. Ferrell and M. McKee) Biofuels Center of North Carolina/N.C. Department of Agriculture and Consumer Services. \$65,722. 2013 (PI)
- “Research Assistance to AIRE” Appalachian Institute for Renewable Energy. \$24,975. 2012 (PI)
- “Energy Savings: Environmental Performance Contracting in the United States” (with T. Cherry) Center for International Climate and Environmental Research - Oslo (CICERO). \$2,650. 2012 (Co-PI)
- “Renewable Energy Manufacturing Supply Chain Workshops” Advantage West. \$4,000. 2012 (PI)
- “ARRA - Edgecombe County Landfill Gas Assistance” Edgecombe County. \$10,000. 2012 (PI)
- “ARRA - Rockingham County Landfill Gas Project” Rockingham County. \$10,000. 2011 (PI)
- “Foothills Landfill Gas Project-Rutherford” Foothills Connect. \$11,000. 2011 (PI)
- “ARRA Wilkes County Landfill” Wilkes County. \$7,000. 2011 (Investigator)
- “Community-based Landfill Gas Utilization in Brazil - Phase II and Extension” US Environmental Protection Agency. \$120,000. 2011 (Investigator)
- “Landfill Gas for Community Development-Construction Phase” Z. Smith Reynolds Foundation. \$25,000. 2011 (Investigator)
- “Landfill Gas Utilization for Columbus County” Cape Fear RC&D Council. \$6,000. 2011 (Investigator)
- “Appalachian Energy Internship Program” (with M. Hoepfl, J. Cazier, J. Ramsdell, D. Scanlin and J. Tiller), NC Department of Administration, State Energy Office. \$10,080. 2010 (Co-PI)
- “Watauga County Energy Project Analysis” Watauga County. \$1,975. 2010 (Lead PI)
- “Appalachian Energy Internship Program” (with M. Hoepfl, J. Cazier, J. Ramsdell, D. Scanlin and J. Tiller), NC Department of Administration, State Energy Office. \$485,857. 2010 (Co-PI)
- “Green Economic Asset Mapping” Z. Smith Reynolds Foundation. \$34,602. 2010 (Lead PI)
- “Community-based Landfill Gas Utilization in Brazil - Phase I” US Environmental Protection Agency. \$120,000. 2009 (Investigator)
- “Community TIES Landfill Gas Development Phase III” Z. Smith Reynolds Foundation. \$55,000. 2008 (Investigator)
- “Community-based LFG Development Phase II” Golden LEAF Foundation. \$125,000. 2007 (Investigator)
- “Rural Landfill Gas Economic Development Demonstration Project” Golden LEAF Foundation. \$97,360. 2006 (Investigator)
- “Phase III Implementation of the State Energy Plan” NC State Energy Office. \$466,765. 2006 (Investigator)



### New River Light and Power EE/DSM Pilot Examples

- Heat Pump Rebate Examples
  - Piedmont EMC [Rebates to Help You Save | Piedmont Electric Cooperative \(pemc.coop\)](#)
    - Heat pumps: \$50/ton (SEER of 15 or higher and completely electric home). Up to \$200 per system
  - Four County EMC [Rebates – Four County Electric Membership Corporation \(fourcty.org\)](#)
    - Energy Star Appliances (clothes washers, dishwashers, refrigerators): \$50/unit rebate
    - Heat pump: \$100/ton. Minimum 16 SEER and 50 gallons
      - See savings potential above
    - Heat Pump Water heater: \$300/unit
      - Can save a medium household around \$350 a year ([source](#))
  - Fayetteville PWC [Full-Programs-Terms-and-Conditions-12-6-2023.pdf \(faypwc.com\)](#)
    - Heat pumps: \$250 - \$400 depending on SEER
  - Duke Energy Carolinas [Smart Saver - HVAC Install - Duke Energy \(duke-energy.com\)](#)
    - Heat pumps: \$300 - \$400 per unit
    - Program estimates over \$300 per year in EE savings for customers
    - Similar program in Duke Energy Progress [Smart Saver - HVAC Install - Duke Energy \(duke-energy.com\)](#)
- Demand Response/Smart Thermostat Program Examples
  - Piedmont EMC [Smart Thermostats | Piedmont Electric Cooperative \(pemc.coop\)](#)
    - Smart thermostat incentive: \$50/thermostat
      - Users save 10-23% on energy bills per year ([source](#))
      - PEMC notes that the demand response function of smart thermostats helps reduce their peak demand, which can be expensive with their wholesale contract.
        - “Help keep rates low! When we work together to reduce energy use on the hottest days in the summer, it helps us keep rates low for everyone.”
  - Connect to Save Program ([source](#))
    - Partnership of multiple cooperatives ([source](#))
    - Automatically manage your energy use on select days (or “events”) when electric demand is high, or nearing peak demand
    - Customers receive up to \$144 off the purchase price of a new qualifying smart thermostat and \$50 each year of continued participation. You may receive an additional \$50 when you opt for

the installation of a water heater load control device. [FAQs \(connecttosavenc.com\)](#)

- EV Charging
  - Utilities are increasingly using telematics programs to collect charging data. [DSIRE 50 States of Electric Vehicles, Q1 2023 Quarterly Report Executive Summary](#) (p.9)
  - Virginia Electric and Power Company (Dominion Energy Virginia) included two EV demand programs in its “[Transportation Electrification Plan](#)” filed May 1, 2023.
    - The “Residential Electric Vehicle EE/DR Program (marketed as EV Charger Rewards)” provides incentives to customers to install “smart” Level 2 EV chargers and enroll in the demand response portion of the program, which allows Dominion to “call” demand response during times of peak system demand to reduce load. This program has been up and running since March 2021 and has over 800 participants. (pp.4-5)
    - The “Residential EV Telematics Pilot” operates in parallel with the EE/DR Program and provides incentives to customers to allow Dominion to use the customer’s on-board telematics to control EV charging in order to reduce load during periods of high demand. (p.7)
- Relevant IRA incentives that may provide a tailwind to participation in these programs
  - Source: [Inflation Reduction Act Guidebook | Clean Energy | The White House](#)
  - Households can claim a tax credit for 30% of the costs of buying and installing a heat pump, up to \$2,000 including support for any electric system upgrades needed to make the home heat-pump-ready. ([Source](#))
  - Beginning in 2023 state programs offer low- and moderate-income households rebates for heat pumps at the point-of-sale, cutting costs of purchase and installation up to \$8,000. If home electrical upgrades are needed to integrate new heat pumps, rebates of up to \$4,000 are available to households. ([Source](#))