STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-2, SUB 1272

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of: Application of Duke Energy Progress, LLC Pursuant to N.C. Gen. Stat. § 62-133.2 and Commission Rule R8-55 Relating to Fuel and Fuel-Related Charge Adjustments for Electric Utilities	))))))	PARTIAL PROPOSED ORDER OF THE SIERRA CLUB

BY THE COMMISSION: On June 15, Duke Energy Progress, LLC (DEP, or the Company) filed an application pursuant to N.C. Gen. Stat. § 62-133.2 and Commission Rule R8-55 regarding fuel and fuel-related cost adjustments for electric utilities, along with the testimony and exhibits of Dana M. Harrington, Kenneth D. Church, John A. Verderame, Ben Waldrep, and Bryan P. Walsh.

On July 7, 2021, the Commission issued an Order Scheduling Hearing, Requiring Filing of Testimony, Establishing Discovery Guidelines, and Requiring Public Notice in which the Commission set this matter for hearing, established deadlines for the submission of intervention petitions, intervenor testimony, and DEP rebuttal testimony, required the provision of appropriate public notice, and mandated compliance with certain discovery guidelines.

Petitions to intervene were filed by NCSEA on June 25, 2021; by CUCA on July 6, 2021; by CIGFUR II on July 8, 2021; and by the Sierra Club on July 26, 2021. The Commission granted NCSEA's petition to intervene on June 28, 2021, CUCA's petition to intervene on July 9, 2021, CIGFUR II's petition to intervene on

July 9, 2021, and the Sierra Club's petition to intervene on July 28, 2021. The intervention of the Public Staff is recognized pursuant to N.C. Gen. Stat. § 62-15(d) and Commission Rule R1-19(e).

On August 27, 2021, DEP filed the supplemental testimony and revised exhibits and workpapers of Dana M. Harrington which resulted in an increase in the amount requested in DEP's original application. DEP requested authorization to publish an additional public notice. The Commission granted the request for second public notice on August 30, 2021.

On August 31, 2021, the Commission issued an Order Changing Expert Witness Hearings to be Remotely Held and Setting Procedures. All parties filed notices consenting to remote hearings.

On August 31, 2021, the Public Staff filed the affidavit of Michelle M. Boswell and the direct testimony of Evan D. Lawrence; the Sierra Club filed the direct testimony of Devi Glick.

On September 9, 2021, DEP filed the rebuttal testimony of John D. Swez and John A. Verderame.

On September 16, 2021, DEP and the Public Staff filed a joint motion for Company witnesses Dana M. Harrington, Kenneth D. Church, and Benjamin Waltrip, and Public Staff witnesses Michelle M. Boswell and Evan D. Lawrence to be excused from appearance at hearing.

On September 17, 2021, DEP and the Sierra Club filed a joint motion for Company witnesses John A. Verderame, Bryan P. Walsh, John D. Swez, and Sierra Club witness Devi Glick to be excused from appearance at hearing.

On September 20, 2021 the Commission issued an Order Excusing Witnesses, Accepting Testimony, Canceling Expert Witness Hearing, and Requiring Proposed Orders. On September 21, 2021, the Hearing Examiner for this proceeding called for the public hearing on Docket Number E-2, Sub 1272 to accept public witness testimony. No members of the public attended the hearing and the proceedings were adjourned.

On September 21, 2021 the Sierra Club and DEP filed a joint letter advising the Commission of an agreement between the two parties in connection with their mutual waiver of cross examination of each other's witnesses.

On September 20, 2021, DEP filed proof of affidavits of publication. On September 24, 2021, DEP filed additional affidavits of publication.

FINDINGS OF FACT

1. The Company's practices with regard to unit commitment and dispatch directly impact the fuel and fuel-related costs incurred by the Company, which DEP seeks to recover in this proceeding.
2. The average cost of operating DEP's coal fleet exceeded the marginal system cost for nearly every month of the test period, meaning that the Company was incurring excess costs during this period.
3. DEP incurred $1.4 million in avoidable operational costs at its coal plants during the test period.

EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 1

Unit commitment is the process by which a utility determines which generating units should operate on the following day.[1] A utility can decide to either keep a generating unit online, bring online a new generating unit, or take a unit offline.[2] In contrast, dispatch is the decision to increase or decrease the generation of a unit that is already online.[3] Because commitment and dispatch determine which units are operated, for how long, and at what capacity, they directly impact the type and amount of fuel that is burned by generating units.[4] The Company's unit commitment and dispatch practices therefore have a direct impact on the fuel and fuel-related costs that the Company incurs and ultimately seeks to recover from ratepayers in this docket.

In this proceeding, DEP is permitted to recover only its reasonably and prudently incurred fuel and fuel-related costs from customers.[5] The Company has an obligation to operate its generation fleet in a manner that minimizes its costs, including the fuel costs recovered in the proceeding, while reliably serving load.[6] DEP has the burden of proof to show that any costs were "reasonably and prudently incurred" and to demonstrate "the correctness and reasonableness" of any charge imposed as a result of this proceeding.[7] Determining whether DEP's fuel and fuel-related costs were reasonable and prudently incurred requires an

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[1] Direct Testimony of Devi Glick p. 13; 5-7; Rebuttal Testimony of John D. Swez and John A. Verderame p. 11; 4-6.
[2] Direct Testimony of Devi Glick p. 13; 7-9.
[3] Direct Testimony of Devi Glick p. 13; 9-11; Rebuttal Testimony of John D. Swez and John A. Verderame p. 11; 6-9.
[4] Direct Testimony of Devi Glick p. 23; 3-6.
[5] N.C. Gen. Stat. § 62-133.2, NCUC Rule R8-55.
[6] Direct Testimony of John A. Verderame p. 4; 18-23.
[7] N.C.G.S. § 62-133.2(d); NCUC Rule R8-55(k).

evaluation of the Company's unit commitment and dispatch decision-making process to ensure that those costs are minimized.

NCUC Rule R8-55 requires the utility to make certain minimum disclosures in its application. While in the past the Commission has determined that these required minimum disclosures were sufficient for DEP to satisfy its burden of proof,[8] neither the statute nor Commission rules establish that these disclosures will always be sufficient.[9] The North Carolina Supreme Court recently held that:

> If a utility expense is properly challenged, the Commission has the *obligation* to test the reasonableness of such expenses. In addition, if there is an absence of data and information from which either the propriety of incurring the expense or the reasonableness of the cost can readily be determined, the Commission may require the utility to prove their propriety and reasonableness by affirmative evidence.[10]

This Commission must ensure that DEP's fuel and fuel-related costs were incurred "under efficient management and economic operations," as N.C.G.S. § 62-133.2(d) commands. This determination necessarily includes an examination of the Company's operations with regard to unit commitment and dispatch, given their direct impact on the fuel and fuel-related costs that DEP seeks to recover from ratepayers in this proceeding.

EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 2

In day-to-day operations, unit commitment and dispatch decisions should be based on the incremental cost to operate a given power plant unit. Accurately

[8] *See, e.g.* Order Approving Fuel Charge Adjustment, Docket No. E-7, Sub 1228 (Aug. 19, 2020).
[9] *See* N.C. Gen. Stat. § 62-133.2(d) (allowing the Commission to consider "any and all other competent evidence that may assist the Commission in reaching its decision"); NCUC Rule R8-55(e) ("Each electric public utility, at a minimum, shall submit to the Commission for purposes of investigation and hearing the information and data in the form and detail as set forth below" (emphasis added)).
[10] *State ex rel. Utils. Comm'n v. Stein*, 375 N.C. 870 (2020) (internal citations and quotations omitted).

determining the cost to operate each unit is key to determining whether it should be committed and dispatched and, thus, whether the fuel and fuel-related costs required to run it have been reasonably and prudently incurred.

DEP bases its dispatch and commitment decisions on each generating unit's "marginal cost of production."[11] "The marginal cost of production—that is, the incremental cost of operating the unit—is composed of a subset of variable costs: the replacement cost of fuel, which is the 'market price of fuel plus variable transportation costs,' and the cost of reagents/byproducts, emissions, and variable O&M."[12] DEP conducts cost-based forward-looking analysis daily using a production cost software known as GenTrader, which determines an optimal unit commitment plan to economically and reliably meet system requirements.[13] Company Witnesses Swez and Verderame testified that only variable costs are utilized in the unit commitment model, and that fixed costs are not considered in the development of the unit commitment plan.[14]

In unit commitment, the lowest-cost unit, based on its marginal cost, will be planned to come online first; progressively more expensive generating units are added until system load is met.[15] The cost of the last (and thus most expensive) unit needed to supply power in a given hour is known as "system lambda." As Sierra Club Witness Glick explained:

> When a unit is committed economically, the unit's marginal cost of production is reasonably expected to be lower cost

[11] Direct Testimony of Devi Glick p. 21; 3-4.
[12] *Id.* p. 20; 18 – p. 21; 3 (quoting Duke Energy Progress Response to Sierra Club Request 1-9).
[13] Rebuttal Testimony of John D. Swez and John A. Verderame p. 11; 17-19; Direct Testimony of Devi Glick p. 23; 8-9 (Citing DEP Response to Sierra Club Request 1-10).
[14] Rebuttal Testimony of John D. Swez and John A. Verderame p. 13; 8-11.
[15] Direct Testimony of Devi Glick p. 14; 14-16.

> than [system lambda] over the next day or days. When a unit is committed uneconomically, the operator has decided to operate that unit at its economic minimum (the lowest MW output that a unit can safely and efficiently maintain) even though that unit's marginal costs of production are projected to be higher than the system lambda.[16]

Uneconomic commitment—where a unit's marginal cost is projected to be higher than system lambda—may be necessary on occasion due to unit testing, reliability needs, transmission constraints, or load requirements.[17] When units are regularly committed when it is uneconomic to do so, however, the utility is incurring excessive costs because the unit's costs are regularly exceeding the costs of other available resources to meet system load.[18]

The marginal cost of production differs from the generation unit's average cost of production, which is the cost actually charged to ratepayers.[19] The average cost of production is calculated by "adding up all fuel and other variable costs incurred to operate each unit and spreading them out over the unit's total MW output."[20] Large deviations between an individual plant's average and marginal costs raise questions. As Ms. Glick explained, "[i]t is reasonable to expect there will be a small difference between marginal unit costs and average unit costs . . . [b]ut a responsible utility manager should seek to minimize the portion of average costs that . . . are [ ] omitted from the unit commitment process."[21] An artificially low marginal cost—i.e., a marginal cost that excludes variable costs that should

[16] *Id.* p. 13; 21 – p. 14; 5.
[17] *Id.* p. 15; 12-15.
[18] *Id.* p. 14; 2-7.
[19] *Id.* p. 21; 5-6.
[20] *Id.* p. 21; 12-14.
[21] *Id.* p. 40; 14 – p. 41; 3.

be considered in unit commitment and dispatch decisions—does not accurately reflect the costs of operating a unit and thus will "put the unit lower on the supply curve and make it more likely that the unit will be committed[,]" ultimately leading to over-commitment and over-dispatch.[22] As discussed below, DEP omits approximately half of its coal fleet's actual fuel and variable O&M costs from the marginal cost used in dispatch and commitment decision-making.[23]

Ms. Glick testified that DEP regularly committed its coal plants during the test period, even though the plants' average costs were typically well above system lambda. She reached this conclusion by "compar[ing] the hourly system lambdas to the monthly average cost of generation reported by DEP at each plant."[24] In fact, DEP's reported average cost of generation at its coal plants exceeded the system lambda during nearly every month of the test year.[25] Stated another way, the units are being operated even though there are less expensive generating assets available on DEP's system whose operation would have reduced costs to ratepayers.

As acknowledged by Ms. Glick, comparing average cost to system lambda "says nothing about whether the plant is the lowest-cost resource available to serve customer load relative to alternative resource options over a longer time horizon."[26] The full forward-going costs would be used by the Company to make resource planning decisions, as opposed to operational decisions such as unit

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[22] *Id.* p. 36; 12-13.
[23] *Id.* p. 9; 13-16.
[24] *Id.* p. 30; 7-8.
[25] *Id.* p. 9; 7-9; *Id.* p. 30; 11-14.
[26] *Id.* p. 32; 2-4.

commitment and dispatch. However, this analysis *does* provide insight as to whether DEC's commitment and dispatch of its coal fleet is providing economic value to ratepayers.[27] The analysis indicates that it does not, as "nearly all of DEP's coal-fired power plants were operating . . . when there were lower cost resources available to serve load."[28]

DEP dismissed Ms. Glick's findings by stating that "[a]veraging instantaneous data into a monthly comparison ignores the fact that the unit may have been critical to supplying customer demand in shorter critical periods of time."[29] DEP maintained that, while it operated its coal plants even when costs exceed system lambda, it was required to do so in order to meet other needs or requirements, such as reliability or transmission congestion concerns and that, regardless, the Company does not have access to the system lambda when making its planning decisions. DEP did not provide evidence to support these assertions, such as hourly data that can substantiate DEP's claims that the units were required for reliability reasons, and thus the Commission affords them no weight.

Even assuming that certain occasions justified DEP's decision to uneconomically commit its coal units and acknowledging that the Company does not have access to the system lambda when making its planning decisions, the sheer scope of DEP's uneconomic operation of its coal units calls into question DEP's assertion that the operation of the units was required for noneconomic

[27] *Id.* p. 32; 9-11.
[28] *Id.* p. 30; 12-14.
[29] Rebuttal Testimony of John D. Swez and John A. Verderame p. 16; 23 – p. 17; 2.

reasons like reliability. More specifically, DEC provided no justification for why the average cost of coal generation exceeded the system lambda for *every* plant in nearly *every* month. Such widespread uneconomic commitment indicates that DEP is not merely accepting a loss "in a few hours of the day or week in order to be online during peak hours[,]"[30] but instead, is systematically committing higher-cost resources, leading to unnecessarily high costs for ratepayers. As Ms. Glick noted, these results "indicate that DEP is either (1) not using robust and complete input data to inform its unit-commitment decisions, or (2) ignoring the results of its unit-commitment analysis."[31]

One potential explanation for why the average cost for DEP's coal units so regularly exceeded system lambda is that the coal units' marginal cost used to make commitment decisions excluded a significant portion of its production costs and was therefore drastically lower than the units' actual cost that DEP seeks to recover from ratepayers. As witness Glick explained:

> [D]uring the test period DEP incurred $315.4 million in fuel and other production costs operating its coal fleet, but only $157.9 million invariable fuel and other operating costs were included in the Company's unit commitment and dispatch modeling. This means that a full *46 percent* of the Company's production costs, equaling $157.5 million, were excluded from DEP's unit-commitment and dispatch decision-making processes.[32]

Because DEP excluded such a large percentage of its actual costs from its decision-making, its unit commitment modeling "showed that its fleet provided a value of almost $54.5 million to its ratepayers during the test year, but in fact the

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[30] Direct Testimony of Devi Glick p. 25; 6-9.
[31] *Id.* p. 25; 12-14.
[32] *Id.* p. 34; 13 – p.25; 2. (emphasis added).

Company actually incurred $103.0 million in actual *excess* production costs relative to system lambda during the test year. Of the total excess production costs incurred, approximately 94 percent, or $96.6 million, represents fuel costs."[33]

As noted above, some deviation between marginal and average cost can be expected.[34] However, a significant variance, such as 46 percent, ultimately harms ratepayers because pricing a coal unit at an extremely low marginal cost causes the expensive coal unit to run when there are cheaper, more economic options available. Essentially, DEP allowed its coal plants to "cut the line" ahead of generation resources with lower costs. The Company then seeks to recover the coal units' average costs from ratepayers, "thereby allow[ing DEP] to continue operating aging and costly coal plants when there are lower cost alternatives that can meet customers' needs."[35]

DEP put forward various explanations for why its coal units' average costs were strikingly higher than their marginal costs, none of which explain the magnitude of the difference. First, DEP pointed to its current rail transportation contracts, noting that these contracts include fixed costs that are excluded from unit commitment decisions.[36] Second, DEP argued that its unit commitment process uses the replacement cost of fuel, not the cost actually paid for its coal supply.[37] Yet, DEP's fuel procurement strategy relies on short-term and spot

[33] *Id.* p. 35; 3-8 (emphasis added).
[34] *Id.* p. 15; 12-15.
[35] *Id.* p. 6; 18 – p. 7; 2.
[36] Rebuttal Testimony of John D. Swez and John A. Verderame p. 26; 20 – p. 27; 4.
[37] *Id.* p. 39; 1-3.

contracts, meaning that the difference between the coal contract price and the price the Company would pay on the market should not differ significantly.[38]

In sum, DEP has not adequately explained why 46 percent of its coal units' operating costs are excluded from commitment and dispatch decision-making. A marginal cost that does not fully account for all variable costs inappropriately manipulates a coal unit's pricing, allowing it to operate even when doing so is not in ratepayers' interest. Accordingly, in future fuel clause adjustment proceedings, the Commission will review DEP's characterization of its coal units' costs as either variable or fixed. To facilitate this review, in future fuel clause adjustment proceedings, DEP shall provide a full breakdown of its coal unit production costs, accompanied by a detailed explanation for each cost and full work papers that show how each component was calculated.[39] This reporting shall include:

1. The full production cost of each coal unit that will be passed on to ratepayers in future fuel dockets, broken down by the following categories:
    a) Fixed costs
    b) Variable costs
        1. Fuel
        2. Reagents/by products
        3. Emissions
        4. Variable O&M

[38] *Id.* p. 39; 3-9.
[39] Direct Testimony of Devi Glick p. 11; 1-5.

2. Marginal production cost of each coal unit used for making unit commitment and dispatch decisions, broken down by the same categories listed above. For any production costs excluded from DEP's marginal production costs, the Company should provide a detailed justification for why these costs are not relevant for making unit commitment decisions.[40]

EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 3

Even accepting the Company's exceedingly low marginal cost for its coal plants, Ms. Glick's analysis showed that DEP incurred nearly $1.4 million in avoidable operational costs at its coal plants during the test period as a result of its uneconomic unit commitment practices.[41] Even after omitting 46 percent of DEP's coal units' operating costs from the Company's unit commitment and dispatch decision-making, witness Glick found that DEP regularly operated its coal generating units uneconomically or "out of merit" order.[42] Out of merit operation occurs when a utility runs a unit despite the unit's operating economics comparing unfavorably to that of other units on the utility's system.[43] This causes units to run despite there being lower-cost resource options available to meet system needs.[44] This uneconomic operation passes avoidable fuel costs on to ratepayers.[45]

Witness Glick identified numerous instances where, even using DEP's artificially low coal unit operating costs, the Company could have avoided incurring

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[40] *Id.* p. 11; 6-16.
[41] *Id.* p. 20; 2-4.
[42] *Id.* p. 25; 3-11.
[43] *Id.* p. 16; 15-16.
[44] *Id.* p. 16; 17-19.
[45] *Id.* p. 17; 1-2.

these costs by committing lower-cost resources to meet system needs. This analysis compared the actual system lambdas with "modeled" unit costs,[46] which represent the cost information the Company had at the time the unit commitment and dispatch decisions were made.[47] When added together, the instances of uneconomic commitment identified by Ms. Glick resulted in DEP incurring $1.4 million in excessive operating costs. Although Ms. Glick recommended a disallowance of $1.4 million in her prefiled testimony, the Sierra Club later withdrew this recommendation in connection with its agreement with DEP to waive cross-examination of each other's witnesses and DEP's agreement to produce certain information in future fuel clause adjustment proceedings, as discussed below.[48]

As discussed above, Ms. Glick recognized that there are certain, limited circumstances where a unit may need to be operated out of merit.[49] However, the Company provided no documentation explaining whether these uneconomic decisions were the result of one of those circumstances. Without such documentation, the Commission does not have adequate information to determine the reasonableness or prudency of the Company's decisions to commit those units in the face of avoidable costs.[50] Because DEP bears the burden of establishing the reasonableness and prudency of its fuel and fuel-related costs, the Commission cannot simply assume that one of those limited circumstances existed. In future fuel charge adjustment proceedings, DEP will not be permitted

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[46] *Id*. p. 30; 7-8.
[47] *Id*. p. 27; 10-12.
[48] Joint Letter from Sierra Club and Duke Energy Progress, LLC, Docket No. E-2, Sub 1272 (September 21, 2021).
[49] Direct Testimony of Devi Glick p. 15; 12-15.
[50] *Id*. p. 27; 16 – p. 28; 2.

to recover excess fuel and fuel-related costs stemming from the deviations from the Company's forward-looking price-based analysis unless a reasonable explanation is provided. Excess fuel and fuel-related costs should be defined as the difference between the costs actually incurred and the least-cost option available to meet system needs.

The Commission acknowledges that pursuant to its agreement with the Sierra Club, in future proceedings to recover its fuel and fuel-related costs, DEP has agreed to provide the following information in its native format upon the submission of a data request:

1. Excel spreadsheets showing the unit cost data that the Company sees at the time it makes its unit commitment decisions. These spreadsheets include all Duke-operated resources available to serve load.
2. Documents containing the Company's Seven Day Forecast reports that show how the Company plans to operate each unit.
3. Spreadsheets that show the total load projected to be served in each hour, expressed in MWs, and the required MWs of operating reserves required in each hour.[51]

The Commission appreciates the Company's commitment to provide this information and believes that it will assist the Commission in determining whether DEP's fuel- and fuel-related costs were reasonably and prudently incurred.

[51] Joint Letter from Sierra Club and Duke Energy Progress, LLC, Docket No. E-2, Sub 1272 (September 21, 2021).

IT IS, THEREFORE, ORDERED as follows:

1. That in future fuel clause adjustment proceedings, DEP shall file a document including a full breakdown of its coal unit production costs, accompanied by a detailed explanation for each cost and full work papers that show how each component was calculated. This information shall include:

a. The full production cost of each coal unit that will be passed on to ratepayers in future fuel dockets, broken down by the following categories:

i. Fixed costs

ii. Variable costs

iii. Fuel

iv. Reagents/by products

v. Emissions

vi. Variable O&M

b. Marginal production cost of each coal unit used for making unit commitment and dispatch decisions, broken down by the same categories listed above. For any production costs excluded from DEP's marginal production costs, the Company shall provide a detailed justification for why these costs are not relevant for making unit commitment decisions.

2. That pursuant to its agreement with the Sierra Club, in future proceedings to recover its fuel and fuel-related costs, DEP shall provide the following information in its native format upon the submission of a data request:

a. Excel spreadsheets showing the unit cost data that the Company sees at the time it makes its unit commitment decisions. These spreadsheets include all Duke-operated resources available to serve load.

b. Documents containing the Company's Seven Day Forecast reports that show how the Company plans to operate each unit.

c. Spreadsheets that show the total load projected to be served in each hour, expressed in MWs, and the required MWs of operating reserves required in each hour.

ISSUED BY ORDER OF THE COMMISSION.

This the ____ day of __________________, 2021.

NORTH CAROLINA UTILITIES COMMISSION

CERTIFICATE OF SERVICE

I hereby certify that all parties of record have been served with the Partial Proposed Order of the Sierra Club either by electronic mail or by deposit in the U.S. Mail, postage prepaid.

This the 21st day of October, 2021.

s/ Gudrun Thompson
Gudrun Thompson