STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-100, SUB 179

In the Matter of:	)	
Duke Energy Carolinas, LLC, and Duke	)	INITIAL COMMENTS OF
Energy Progress, LLC, 2022 Integrated	)	APPALACHIAN VOICES
Resource Plans and Carbon Plan	)	
	)	

Pursuant to North Carolina Utilities Commission ("Commission") November 19, 2021 *Order Requiring Filing of Carbon Plan and Establishing Procedural Deadlines, and its Order Granting Extension of Time,* entered on November 29,2021, Intervenor, Appalachian Voices, through counsel, hereby submits the following evaluation of, and comments on the Carbon Plan filed on May 16, 2022 by Duke Energy Progress, LLC and Duke Energy Carolinas, LLC (collectively, "Duke Energy" or the "Companies").

Additionally, pursuant to the Commission's *Order Establishing Additional Procedures and Requiring Issues Report* entered on April 1, 2022, Appalachian Voices identifies, in its Attachment D to these Comments, the substantive issues that it believes should be subject to an expert witness hearing

SUMMARY

Appalachian Voices has actively engaged efforts to develop a carbon reduction plan for North Carolina since the announcement of Governor Cooper's Clean Energy Plan in 2018 and was a collaborator in the North Carolina Energy Regulatory Process that laid the groundwork for HB 951. Appalachian Voices is an active participant and leader in the ongoing Low-Income Affordability

Collaborative, for which Rory McIlmoil, Senior Energy Analyst, serves as one of its co-leaders. That deep engagement and shared knowledge inform these comments.

Duke Energy's proposed Carbon Plan identifies four core objectives: CO2 reduction, affordability, reliability, and executability. These comments focus on the first two: namely the ability of the utility to meet both interim and long-term reductions of CO2 while maintaining affordable service and mitigating bill impacts for low- to moderate-income (LMI) customers. In short, Duke's Carbon Plan portfolio in its current form must be rejected because Duke Energy has failed to fully address bill impacts and affordability for customers, including its nearly one million residential customers who qualify as low-income. At least one-quarter of these LMI customers already struggle to meet monthly payments and any increase in energy bills would exacerbate existing affordability challenges. By failing to appropriately consider the potential that energy efficiency (EE) and distributed energy resources (DERs) offer for lowering carbon emissions, energy demand, and bills for LMI customers, while at the same time advocating for a rapid large-scale expansion of near-term natural gas generation resources, the company has failed to present a least cost and affordable plan to meet carbon reduction goals as mandated by H.B 951.

Appalachian Voices offers below a detailed critique of the Carbon Plan relating to affordability, energy efficiency and new natural gas infrastructure. These comments and recommendations are supported and discussed in detail in the verified expert reports prepared by Elena Krieger, et al. Physicians, Scientists

and Engineers for Healthy Energy (PSE) and Rory McIlmoil, Senior Energy Analyst for Appalachian Voices.

INDEX OF ATTACHMENTS

Appalachian Voices submits the following attachments filed contemporaneously with these Initial Comments.

Attachment A: PSE Health Energy, Elena Krieger, et al, "Review and Comments on Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's 2022 Proposed Carbon Plan" ("PSE Report")

Attachment B: Rory McIlmoil, "Addressing Low-Income Energy Affordability in the Carolinas Carbon Plan" ("Affordability Report")

Attachment C: DE's Responses to App Voices Data Request No. 1-1

Attachment D: Substantive Issues That Should Be Subject to An Expert Witness Hearing

DISCUSSION

Rather than focusing on least cost and reliability, Duke's proposed plan relies heavily on new generation facilities that include costly investment in carbon emitting natural gas energy generation, and practically ignores non-capital-intensive energy resources such as energy efficiency, demand-side management and distributed energy. Duke's proposal, while naming affordability as one of its core principals, fails to provide a reliable and least cost mix of resources to reach carbon reduction goals as required by law and makes no provision to address bill impacts and affordability for its customers.

I. LEGAL FRAMEWORK

The Commission is empowered and directed to develop the least cost plan to reach carbon reduction goals using the entire spectrum of demand-side options, including affordability considerations. House Bill 951, adopted by the N.C. Legislature and signed into law by Governor Roy Cooper on October 13th, 2021, provides the Commission with new tools and the responsibility to act on behalf of all North Carolinians to chart a cleaner, safer energy future. The law makes clear that the Commission is tasked not with simply approving a plan proposed by Duke Energy but with "taking all reasonable steps" to develop, with utilities and stakeholders, a least cost plan for meeting carbon reduction goals for emissions of CO_2 from electric generating facilities in North Carolina. Those steps, however, must journey along the least cost path toward an adequate and resilient grid.

In particular, the Legislature made clear in HB 951 that least cost and reliability were the primary ingredients for determining what constituted "reasonable steps" in achieving carbon reduction goals. In achieving the authorized carbon reduction goals, **the Utilities Commission shall**:

> (1) Develop a plan . . . **to achieve the least cost path** consistent with this section . . . [;]
>
> (2) Comply with current law and practice with respect **to the least cost planning** . . . [;]
>
> (3) Ensure any generation and resource changes maintain or improve upon the **adequacy and reliability** of the existing grid. . . . [;] and

> (4) Retain discretion to determine optimal timing and generation and resource-mix to achieve **the least cost path to compliance** with . . . carbon reduction goals . . . .[1]

2021-165 N.C. Sess. Law 1-2 (emphasis added).

Least cost planning requires use of the entire spectrum of demand-side options, including conservation, load management, distributed energy resources and energy efficiency programs. In addition to business-as-usual concerns like power generation, transmission, distribution, and grid modernization, HB 951 empowers the Commission to consider additional measures to meet the challenge, including "storage, energy efficiency measures, demand-side management, and the latest technological breakthroughs" to achieve the least cost path consistent with the carbon reduction goals.[2] In determining generation and resource mix, the bill further provides that least cost planning requires incorporating the policy priorities set out in N.G. Gen. Stat. 62-2(a)(3a),[3] such that necessary resources include:

> . . . use of the **entire spectrum of demand-side options**, including but not limited to conservation, load management and efficiency programs, **as additional sources of energy** supply and/or energy demand reductions. To that end, to require energy planning [and fixing of rates] in a manner to result in the **least cost mix of generation and demand-reduction measures** which is achievable . . . [.]

N.C. GEN. STAT. § 62.2(a)(3a) (emphasis added).

Prioritizing energy affordability by focusing on load management and energy efficiency resources fulfills least cost path requirements and executive

[1] 2021-165 N.C. Sess. Law 1-2 (emphasis added).
[2] 2021-165 N.C. Sess. Law 1.
[3] *Id.* (Part I, Section 1(2)).

directives to incorporate environmental justice and equity considerations and benefits. Following the passage of HB 951, Governor Roy Cooper issued Executive Order 246, citing the urgent need for achieving the carbon emission reduction goals called for by HB 951, and noted:

> climate change disproportionately impacts people of color, low-income communities, and indigenous communities, and **responsible solutions to climate change must equitably reduce GHG emissions . . .** [.][4]

Accordingly, Gov. Cooper encouraged state boards and commissions, such as the Utilities Commission, together with all other North Carolina entities "to incorporate environmental justice and equity considerations and benefits into their work."[5] Energy affordability is not only related to energy efficiency resources, which are essential to a least cost carbon reduction plan, but affordability is also at the heart of environmental justice and equity considerations that the Commission has been called on to incorporate in its work.

Prioritizing investments in low-income and high energy-burdened households helps meet carbon reduction goals while achieving significant cost and energy savings. These savings result from expansion of "energy efficiency, electrification, community solar and demand response programs for low- and moderate-income households."[6] While Duke Energy

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[4] N.C. Exec. Order No. 246 (Jan. 7, 2022) ("North Carolina's Transformation to a Clean, Equitable Economy").
[5] *Id.*
[6] *See* Arjun Makhijani & Boris Lukanov, *Aligning Climate and Affordability Goals Can Save States Billions*, UTIL. DIVE (Mar. 30, 2022), https://www.utilitydive.com/news/aligning-climate-and-affordability-goals-can-save-states-billions/621233/.

asserts that "affordability" is one of four "core Carbon Plan objectives"[7] and often uses the term "affordability" throughout its proposal, Duke provides no definition of what constitutes affordability and includes no investment in energy efficiency, distributed energy or demand-side management programs for low- and moderate-income households in its plan. To comply with HB 951 and Executive Order 246, the plan ultimately adopted by the Commission should clearly incorporate energy affordability considerations that help advance climate goals and accelerate the clean energy transition.[8]

II. AFFORDABILITY MUST BE INCLUDED AND ASSESSED AS A CORE PRINCIPLE OF THE CARBON PLAN

Decarbonizing the grid through a transition to clean, renewable energy resources, battery storage, and substantial investments in energy efficiency and demand-side management is urgent and critical. The plan to guide that transition must, as a core and integrated objective, directly address existing and future affordability challenges and impacts, through short-term bill assistance and long-term investments in energy efficiency, distributed energy resources and demand-side management. Unfortunately, Duke Energy's proposed carbon plan is largely devoid of investment in these resources. As detailed further in the reports from PSE and McIlmoil, such investments not only enhance affordability and reduce

[7] CAROLINAS CARBON PLAN, DUKE ENERGY at Executive Summary at 2 (May 16, 2022), https://starw1.ncuc.gov/NCUC/ViewFile.aspx?Id=2bb3f59d-c9a4-4f65-aace-567b38d51db2.
[8] Boris Lukanov et al., *Pathways to Energy Affordability in Colorado*, PHYSICIANS, SCIENTISTS, AND ENG'RS FOR HEALTHY ENERGY (Feb. 3, 2022), https://www.psehealthyenergy.org/our-work/publications/archive/energy-affordability-colorado/.

the long-term need for funding bill assistance programs but would also contribute to decarbonization as well as improved grid reliability and resiliency and to reducing or avoiding the need for new gas capacity, all of which would constitute a least cost plan that lowers costs for all customers.

A. Duke Energy Adopts "Affordability" As Core Principle of Its Carbon Plan but Fails to Give Definition or Substance to the Term.

Duke Energy's proposed Carolinas Carbon Plan (CCP) identifies four core objectives: CO2 reduction, affordability, reliability, and executability.[9] The Executive Summary repeatedly refers to "affordability," but conflates "cost" with "affordability" and provides no definition of affordability in the context of its plan.[10] McIlmoil notes that after nearly a year of coordinating with and participating in the Low-Income Affordability Collaborative (LIAC) discussions, which involved the consideration of definitions of affordability through the process, Duke is still unable to define the term, and uses "affordability" and "least cost" interchangeably. While related, they are not the same. "Least cost" does not mean "affordable," it merely means "less costly than the alternatives."[11]

Duke Energy failed to analyze affordability impacts of the four CCP portfolios for its North Carolina customers beyond the "least cost" analyses. In response to requests regarding its use of the customer usage and demographics

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[9] CAROLINAS CARBON PLAN, *supra* note 7, at Executive Summary at 2.

[10] *See* Attachment B, Addressing Low-Income Energy Affordability in the Carolinas Carbon Plan at 5-6 [hereinafter Affordability Report].

[11] *Id.* at 6. ("For instance, a low-income mother driving her children to daycare every day likely cannot afford to pay $5 a gallon, but she still has to drive her children to daycare so that she can go to work. On the way she sees one gas station charging $4.89 a gallon and another charging $4.99 a gallon. Neither is affordable for the mother, but the price at the first station is "more" affordable than the second.")

data prepared for the LIAC analysis, Duke Energy admitted that the LIAC analytic results were not included in its Carbon Plan, claiming that those numbers were still a work in progress at the time the Carbon Plan was developed.[12] However, the datasets for a deep analysis of potential affordability impacts on residential customers were available as early as September 2021, while even the final version was available for six weeks prior filing of the proposed Carbon Plan itself.[13] Further, when asked what modeling was done to determine how the estimated cost of each portfolio would impact arrearages and disconnections for residential customers, particularly low-income customers, Duke Energy responded that the information was outside the scope of the Carbon Plan proceeding, and again reverted to conflating "least cost" with "affordability."[14]

B. Duke Energy's Carbon Plan Turns a Blind Eye To Current Affordability Challenges for Residential Customers and Ignores Impacts from Carbon Plan costs.

The Companies report that a little more than 980,000 total residential households in the state (almost one-third (32%) of its residential customer base) qualify as low-income per federal poverty guidelines (less than 200% of the Federal Poverty Level, or FPL).[15] Despite this fact, historically Duke Energy has committed little toward energy efficient investments for low-income households,[16] and continues this trend in its proposed Carbon Plan.

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[12] Duke Energy Response to Appalachian Voices Data. Req. 1-10.
[13] Affordability Report at 8.
[14] Duke Energy Response to Appalachian Voices Data Req. 1-7.
[15] Duke Energy Response to Appalachian Voices Data Req. 1-17.
[16] S. All. for Clean Energy, *Energy Efficiency in the Southwest: Third Annual Report—January 26, 2021*, at 9 (2021), https://cleanenergy.org/wp-content/uploads/22Energy-Efficiency-in-the-Southeast22-third-annual-report-2021.pdf.

While qualifying as a low-income household does not automatically lead to affordability-related impacts such as being in arrears, disconnection for non-payment, or general energy insecurity, those impacts do provide a helpful metric for assessing "affordability challenges," especially for low-income customers.[17] For the benefit of LIAC discussions, Duke Energy created a definition for "arrears struggling households," to include customers who found themselves in an arrearage situation in which they (1) were behind on paying their average/regular bill amount for six or more months during the 12-month pre-COVID period or (2) were behind by twice the amount (or more) of their average bill for two or more months.[18],[19] As reported by McIlmoil, and shown in his **Table 1 and Table 2** below, LIAC analytics show that 23.6% of Duke Energy's Low-Income residential customers, and 13.1% of its non-low-income customers are seriously struggling to pay their energy bills.[20] and the percentage of customers struggling is continuing to grow.[21]

Table 1: Households above and below 200% FPL meeting Duke Energy's definition of "arrears struggling" in 2022

	# Customers	Arrears struggling	% Arrears struggling
Low-income	980,773	231,165	23.6%
Non-low income	2,112,715	277,367	13.1%
Total	**3,093,488**	**508,532**	**16.4%**

[17] Affordability Report at 8.
[18] *See* Joint N.C. Low-Income Affordability Collaborative Q. Progress Rep. at Appendix F, N.C. Util. Comm'n Docket E-7 Subs 1213, 1214, 1187 and E-2 Subs 1219, 1193 (Apr. 25, 2022), https://starw1.ncuc.gov/NCUC/ViewFile.aspx?Id=ae12f626-823d-4ae7-86c5-bc4e49aa4208 ("Revised LIAC Customer Analytics").
[19] Appalachian Voices is concerned that this definition is overly restrictive and captures only those households that are experiencing extreme difficulties. *See* Affordability Report at 10.
[20] *Id.* at 8.
[21] *Id.* at 9.

Note: the totals for "arrears struggling" and "% arrears struggling" are somewhat higher than what was reported in the Assessment of Customer Challenges Related to Affordability produced for the LIAC. This is the result of the percent of the residential customer base qualifying as low-income being higher in 2022 (as reported by the Companies) than it was during the 12-month pre-COVID period (again, as reported by the Companies).

Table 2: Trends in residential arrearages during May months for Duke Energy customers since COVID onset

	No. customers	No. in arrears	% in arrears	Total arrears ($M)	Arrears per customer
May 2020	3,028,434	498,718	16.5%	$116.7	$39
May 2021	3,055,901	457,309	15.0%	$126.0	$41
May 2022	3,116,340	574,556	18.4%	$213.4	$68
5/20 to 5/21	**27,467**	**(41,409)**		**$9.0**	**$3**
Percent change	0.9%	-8.3%		7.7%	6.7%
5/21 to 5/22	**60,439**	**117,247**		**$87.7**	**$27**
Percent change	2.0%	25.6%		69.8%	66.5%

In their report, PSE discusses the negative outcomes associated with high energy bills, including housing instability, lost access to household necessities, homes kept at unsafe or unhealthy temperatures due to not having enough money to pay energy bills, extended periods of poverty, and increased incidence of death.[22] Using models based on accepted methods and data from national sources, PSE simulated household energy bills across the Duke service area in North Carolina. Their model estimates the number of Low-Moderate Income (LMI) households to be 1.15 million households (with 500,000 less than the Federal Poverty Level (FPL) and 650,000 households between one and two

[22] Attachment A, Review and Comments on Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's 2022 Proposed Carbon Plan at 14 [hereinafter PSE Report].

times the FPL). These figures are approximately 17% higher than that reported by Duke.[23]

The energy cost burden distribution within LMI income brackets is shown below in **PSE Figure 1**.[24] "Energy burden" is defined as the percentage of gross household income spent on energy costs. The national average for low-income households is 8.6% - three times higher than for non-low-income households, which is estimated at 3%.[25] Both the LIAC analytics[26] and the PSE modeling confirm that low-income and/or arrears struggling households in the Duke service area have a greater likelihood of a higher energy burden.[27]

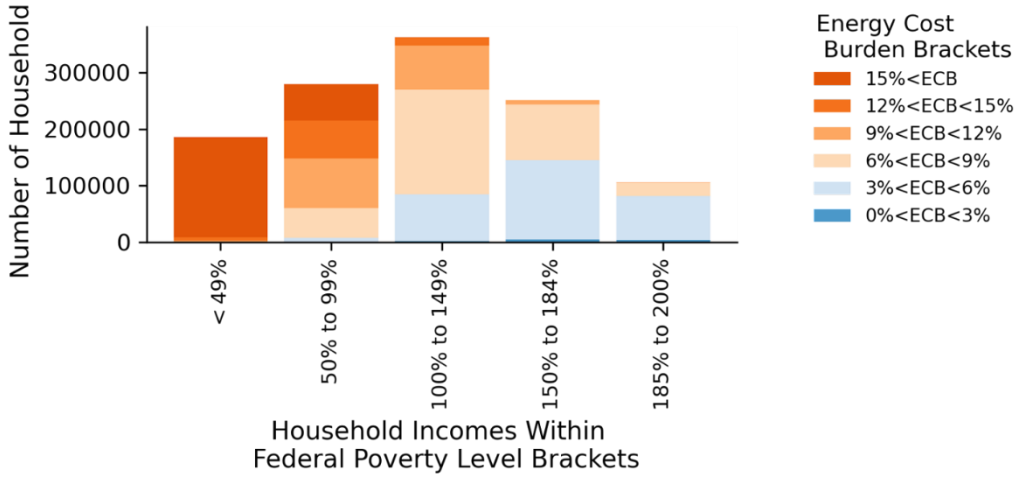

Figure 1. Energy cost burden distributions within LMI income bracket

[23] Id. at 16
[24] Id. at 15.
[25] *Low-Income Community Energy Solution*s. DEP'T OF ENERGY, https://www.energy.gov/eere/slsc/low-income-community-energy-solutions#:~:text=Energy%20burden%20is%20defined%20as,which%20is%20estimated%20at%203%25.
[26] Affordability Report at 16 ("At an 8% electric burden a household is 19% more likely to meet the arrears definition, 36% more likely with a 10% electric burden, and 52% more likely with a 12% electric burden.").
[27] PSE Report at 15-16.

The Companies also failed to consider two other factors related to affordability challenges – household energy intensity and winter impact and heat source (and summer impact) – that should inform resource allocation for energy efficiency (EE) and distributed energy resources (DER). Based on LIAC analytics produced by the Companies, low-income and/or arrears struggling households have a much higher energy intensity (kilowatt-hours consumed per square foot) than households above the 200% FPL threshold, likely due to poor housing quality and lack of energy efficiency.[28] They also often have higher differences between average monthly usage in both winter and summer months, and an overall higher monthly use overall.[29] Thus, resource allocation that prioritizes addressing affordability challenges can, at the same time, address demand-side management and energy efficiency priorities, working together to create a least cost allocation of resources, ultimately resulting in lower costs for all customers.

C. Duke Energy's Failure to Adequately Incorporate Energy Efficiency and Distributed Energy Investment Forfeits Available Co-Benefits of Addressing Energy Affordability Challenges While Reducing Energy Demand.

Duke Energy's failure to analyze affordability data in the scope of its Carbon plan results in lost opportunities to evaluate the co-benefits addressing affordability concerns by implementation of energy efficiency, community solar, and demand response resources.

PSE's analysis demonstrates how investment in energy efficiency, community solar, and demand response can significantly reduce energy bills of

[28] Affordability Report at 14.
[29] *Id.*

LMI households and achieve significant savings.[30] In their analysis, PSE looks at the impact of investments in energy efficiency improvements, in the form of grants and low-cost loans, community solar programs, like the Illinois Community Renewable Generation Program, and demand response rates. They then visualize the energy cost burden distributions before and after each of these investments. **PSE Figure 3** below shows the dramatic improvement in energy burdens across all low-income brackets.[31] In their model, the total energy affordability gap (the amount of money needed to bring energy bills below the six percent threshold) is reduced "from $630 million to $237 million after the investment in efficiency, then to $70 million after community solar is introduced, and finally down to $30 million after demand response is implemented."[32]

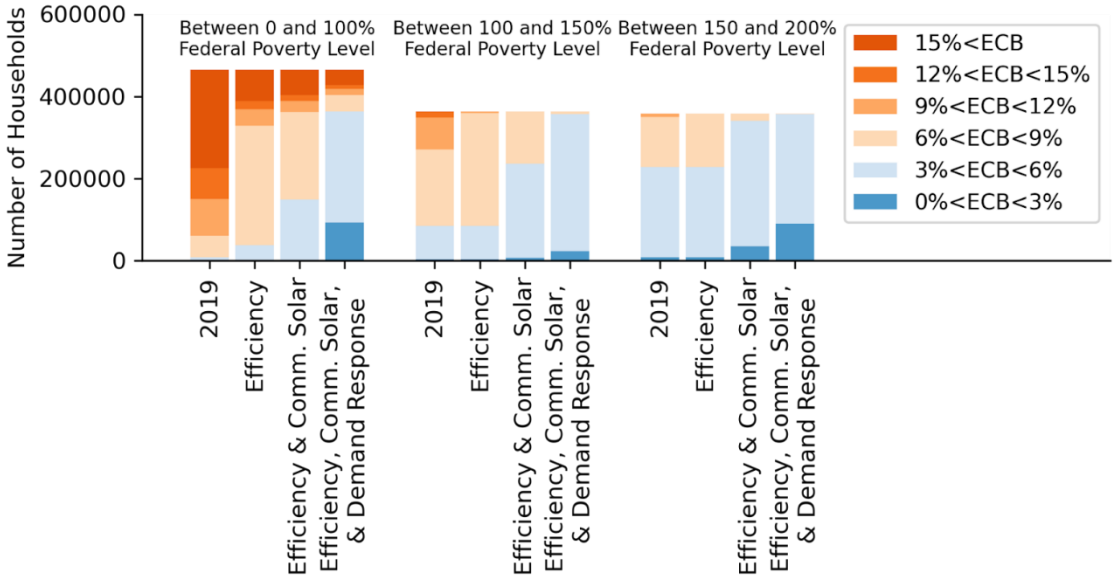

Figure 3. Energy cost burden distributions after sequential household interventions.

[30] *See* PSE Report at 17-18.
[31] *Id.* at 17.
[32] *Id.* at 18.

Over time, these types of investments generate enormous savings as well as decreased energy demand. **PSE Figure 4** below demonstrates the economic scenario in which, over a 15-year period, all households with incomes under twice the FPL receive all three interventions, with approximately eight thousand households per year receiving treatment.[33] PSE's model shows $1.75 billion in savings over a 15-year time period. Those savings will continue to accrue after the conclusion of the15-year timeline, since most of the investments have lifetimes that extend well past that period. Each of these investments also provides co-benefits in terms of carbon reduction and demand reduction. As modeled by PSE, the efficiency investments in LMI households alone could reduce annual energy demand by roughly 2,800 GWh.[34]

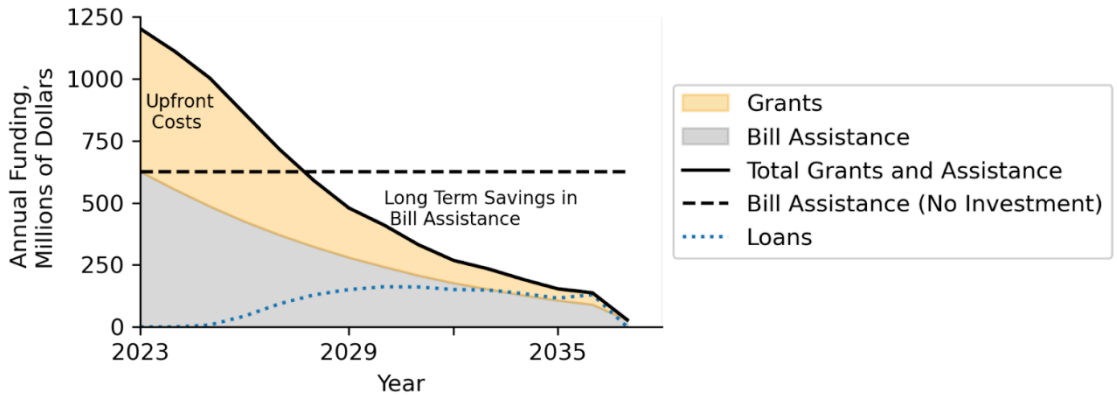

Figure 4. Annual funding and savings from proposed household investments.

D. The Carbon Plan Must Incorporate Affordability Programs and Investments to Avoid Energy Insecurity.

As both the McIlmoil and PSE reports conclude, in the design and adoption of its Carbon Plan, the Commission and Duke Energy have a profound

[33] *Id.* at 19.
[34] *Id.* at 18.

opportunity to decrease energy cost burdens and related affordability challenges for low-income households while simultaneously reducing carbon emissions and lowering costs for all customers.

Despite including affordability as one of the core objectives for the CCP, and despite having coordinated and participated in all aspects of the LIAC process over the past year, the Companies neglected to include in the CCP any modeling of data generated in the LIAC progress, nor any programs or investments that address and alleviate existing and future affordability challenges for residential customers. In the Carbon Plan to be adopted by this Commission, and in future iterations of the plan, such impacts must be evaluated and the benefits of addressing those impacts through energy efficiency, community solar, and demand-side management must be considered.

III. DUKE'S PLAN FAILS TO ACCOUNT FOR RISKS ASSOCIATED WITH NEW NATURAL GAS PLANTS

The Companies' plan proposes the addition of more than 3 gigwatts (GW) of new gas plants in part to replace coal fired plants. While the retirement of coal plants will bring significant improvement in greenhouse gas reductions and public health benefits, Duke fails to account for the full lifecycle greenhouse gas impacts of switching to gas which undermine climate benefits of coal-to-gas conversion. As the report of PSE discusses in detail, the risks related to new natural gas generation include greenhouse gas and air pollutant emissions, financial risks associated with stranded assets, challenging fuel supply lines, and volatile gas prices.

A. Increased Greenhouse Gas and Air Pollutants

Duke only accounts for the direct stack-level emissions of CO2. However, failing to account for lifecycle methane emissions from gas use enables Duke to rely on a fossil fuel with significant greenhouse gas impacts. Methane leaks throughout the entire cycle of production, processing, transmission, and use of gas. This leakage therefore nearly doubles the near-term climate impact of direct CO2 emissions from gas generation estimated by Duke, undermining potential climate benefits of gas use. To achieve real climate benefits, Duke's low-carbon portfolio should rely on non-fossil alternatives such as renewable energy and demand-side efficiency.

B. Significant Financial Risk for Least Cost Path

Increasing reliance on natural gas also opens a number of financial risks. Primary among these is gas price volatility. Recently the price more than quadrupled from May 2020 to May 2022, from $1.75/MMBtu to 8.14/MMBtu.[35] Such extreme price volatility further drives increases in customer costs. Duke acknowledges that without new gas line infrastructure, gas prices in North Carolina could increase by 33% by 2030 compared to baseline projections.[36] Increasing gas prices — due to lack of pipeline infrastructure or other causes — contribute to a risk that new gas infrastructure will be increasingly expensive and non-competitive with renewable energy resources such as wind and solar, whose

[35] *Natural Gas*, U.S. ENERGY INFO. ADMIN. (July 2022), https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm.
[36] CAROLINAS CARBON PLAN, supra note 7, at Appendix N at 9.

costs, PSE notes, have declined by 40 and 82 percent in the last ten years for utility-scale wind and solar, respectively.[37]

C. Unreasonable Reliance on the Uncertain Mountain Valley Pipeline

Each of Duke Energy's proposed portfolios for its carbon plan rely on "firm capacity of natural gas from Appalachia" through the controversial Mountain Valley Pipeline (MVP). The MVP is one of the most expensive pipelines ever– with most recent estimates for the project totaling over $6.6 billion, or $21.78 million per mile. In 2017, the American Petroleum Institute put out a study of all gas infrastructure in the United States, and found that the average pipeline cost is $178,000 per inch-mile and that it is 20% cheaper to build a pipeline in the Southeastern U.S. than anywhere else in the country.[38] So for a 42-inch pipeline crossing through the Southern Appalachian region ($5.98 million per mile), the MVP is more than 3.6 times as expensive as comparable projects.

Purchasing gas from this project will not be affordable. At this time, Duke Energy does not have a contract for any of the capacity on the project, so a purchase agreement at this stage would factor in all of the current costs. Duke Energy is only focusing on the market availability and not what the financial cost could mean for its ratepayers – volatile fuel cost and a constantly high costs for infrastructure.

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[37] PSE Report at 5.

[38] KEVIN PETAK ET AL., U.S OIL AND GAS INFRASTRUCTURE INVESTMENT THROUGH 2035, 20 (Am. Petroleum Inst., April 2017), https://www.api.org/-/media/Files/Policy/Infrastructure/API-Infrastructure-Study-2017.pdf.

Duke's proposal relies upon a modification of the capacity of an extension of the MVP- MVP Southgate, which in turn, is dependent on completion and operation of the mainline. From their own reports, the MVP is just under 56% complete to final restoration.[39] The five equity-holding parent companies of the MVP have taken impairment charges totaling almost $5.5 billion. NextEra Energy, a 31% equity holder of the project, reported in a financial statement that the Mountain Valley Pipeline has a "very low probability of completion." [40]

The Southgate extension, on which Duke's plan relies, has zero construction to date, is missing its 401 water quality permit under the Clean Water Act in North Carolina and had its application to build its sole compressor station in Virginia denied, and may require a restart of its entire Federal Energy Regulatory Commission authorization process.

Duke Energy's attempts to solely focus on market availability and building greenfield gas infrastructure instead of affordability and more cost-effective energy generation methods point to priority of profit through rate hikes over a least cost and affordable path to reach carbon reduction goals.

IV. THE CARBON PLAN CAN PROVIDE NUMEROUS ALTERNATIVES TO GAS PLANTS

Duke Energy did not fully assess alternative resources to gas to meet its demand. PSE, in its report, recommends modeling using alternative energy

[39] Env't Compliance Monitoring Rep. for the Mountain Valley Project for the Period January 16 Through 22, 2022 under CP16-10, Fed. Energy Regulatory Comm'n Docket No. CP16-10-000 (2022), https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20220131-4000.

[40] Nephele Kirong, *NextEra Takes $800M Impairment Charge on Mountain Valley Pipeline Investment* S&P GLOBAL (Feb. 21, 2022), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/nextera-takes-800m-impair,ment-charge-on-mountain-valley-pipeline-investment-69002279.

sources, including offshore wind, distributed energy resources, demand-side efficiency, and utility-scale energy storage. While no resource can replace a gas plant one-to-one, a portfolio mix of these resources can meet the same energy and capacity requirements that Duke proposes to meet with gas.

A. Demand-Side Energy Efficiency

Duke's plan models an annual demand-side efficiency savings target of 1% of previous year sales but applies that target only to "eligible resources," resulting in an actual demand-side savings of 0.9 percent per year in 2023 declining steadily to 0.68 percent per year in 2044.[41] In its report, PSE calculated that if Duke saved 1% of all retail sales, as opposed to solely "eligible resources," it would save an additional 4,700 GWh in 2030 and 10,300 GWh in 2035 (total savings of 10,200 GWh and 17,100 GWh respectively); if Duke saved 2% per year, it would save an additional 14,300 GWh in 2030 and 25,400 GWh in 2035 (total of 19,700 GWh and 32,200 GWh respectively).[42] This analysis suggests that a conservative estimate for 1% efficiency savings is roughly twice the value reported by Duke and a feasible estimate of 2% potential savings is even three times higher. In addition to saving energy, expanded demand-side efficiency can reduce capacity requirements. PSE's analysis concludes that incremental investments in demand-side energy efficiency to achieve 2% savings could potentially almost meet the energy value of the proposed gas combined cycle plants by 2030.[43] Additionally, as discussed above and thoroughly

[41] Duke Energy Response to Public Staff Data Req. 15-2.
[42] PSE Report at 6.
[43] PSE Report at 7.

addressed in both the PSE and McIlmoil reports, expanding low-income energy efficiency efforts holds the potential to provide energy and capacity savings, reducing the need for investment in new infrastructure such as gas plants while improving affordability for the customers who most need it. With current levels of participation in energy efficiency and demand response programs by low-income households at only 4.21%, there is great room for growth.[44]

B. Utility Scale Storage

The CCP does not consider significant levels of demand response and energy efficiency, nor how distributed resources combined with energy storage can meet peak demand needs. The PSE analysis, however, finds that a portfolio of demand response, energy efficiency, and energy storage would be cheaper than a combustion turbine by 17-60 % (net present value without and with accounting for the value of excess energy generated). “The 1,100 MW used in scenarios 1-3 suggests that the proposed combustion turbine could be replaced with 512 MW of energy storage, 1,820 MW of energy efficiency, and 2,411 MW of demand response — and would produce additional value from these resources, such as energy efficiency savings at non-peak times.”[45]

The Plan would benefit from conducting additional modeling runs to determine whether additional energy storage — both standalone and as part of clean energy portfolios — might successfully replace new combustion turbine capacity. Duke currently proposes to add 1.7-2.1 GW of battery storage by 2030-2034 and 2.0-4.2 GW by 2035, alongside an additional 1.7 GW of new pumped storage.

[44] Duke Energy Response to Appalachian Voices Data Req. 1-17.
[45] PSE Report at 7.

New York, which has similar total electricity consumption to North Carolina, recently doubled its 2030 storage target from 3 GW to 6 GW and already has 12 GW of storage in its interconnection queue. If Duke were to pursue a similar storage target for 2030 (approximately 1 GW for every 23,500 GWh of current annual demand), that would lead to a target of 6.8 GW of storage by 2030.[46]

C. Distributed Energy Resources

The CCP omits DERs as part of its carbon mitigation strategy and fails to consider the benefits of DER for energy affordability for disadvantaged and low-income households, effectively rejecting considerations of equity and affordability in adopting efficiency measures and DERs. The Companies project the adoption of 537 MW of distributed solar by 2030 and 882 by 2035, generating 700 GWh and 1,150 GWh respectively.[47] This represents only 0.8 percent and 1.3 percent of retail sales in 2030 and 2035, greatly underestimating potential adoption. In contrast, the National Renewable Energy Lab (NREL) estimates that maximum solar penetration potential is at least 30 percent of peak load.[48] Noting the exponential growth rate of small scale solar by 30 percent per year between 2014 and 2021, PSE projects that, starting from 150 GWh in 2023, a 30% growth rate could be expected to achieve 3,500 GWh by 2035, more than double the Companies' projections.[49] By comparison, distributed solar in New Jersey generated 3.7 % of sales, and 5% sales in Massachusetts. PSE calculates that

[46] *Id.* at 9.
[47] PSE Report at 9-10 (citing Duke Energy Response to Public Staff Data Req. 4-11); CAROLINAS CARBON PLAN, *supra* note 7, at Tables 2-1 and 2-2.
[48] Anderson Hoke et al., *Maximum Photovoltaic Penetration Levels on Typical Distribution Feeders: Preprint* (NREL/JA-5500-55094) (Nat'l Renewable Energy Lab'y, 2012), https://www.osti.gov/biblio/1051922.
[49] PSE Report at 11.

that aiming for 5% of sales in distributed solar across North and South Carolina by 2030 would generate more than 6,350 GWh from 4.8 GW of power.[50] To date, solar and DER adoption in North Carolina has been overwhelmingly associated with wealth. Only 4% of solar installations were for the lowest 20 percent income bracket. Program to reduce barriers for low-income households to access DER, such as low-interest or no-interest financing, community outreach and training, net metering pricing incentives for low- and moderate-income households, and community solar, would unlock huge potential gains in solar DER deployment, CO_2 reduction, and energy affordability.

Demand response does not play a significant role in Duke's proposed plan. PSE notes that Duke currently has 690 MW of demand response in its portfolio, equivalent to approximately 1 percent of the winter peak, but only 32 MW of this demand response is residential. PSE maintains that expanded demand response can play a significant role in reducing the need for gas combustion turbines and help improve affordability for low-income residential customers.[51]

D. Additional Wind Generation Deployment.

Duke offers three possible offshore wind deployment scenarios, ranging from 0 (Portfolio 3), to 800 MW (Portfolios 1 and 4), and 1,600 MW (Portfolio 2), but PSE concludes that the constraints of its modeling "greatly limit offshore wind's potential and even undercut North Carolina's own goals."[52] If Duke

[50] *Id.*
[51] *Id.* at 11.
[52] *Id.* at 13.

integrated 2.8 GW of offshore wind energy by 2030, in line with the Governor's Executive Order, PSE projects that the addition would generate an additional 10,300 GWh of electricity, with winter load capacity reaching about 1.1 GW.[53]

E. Participation in Regional Transmission Organization.

Duke notes that modeling the impacts of joining a regional transmission organization ("RTO") is not a reasonable or practical assumption for the companies to include in their plan. However, recent independent analyses of decarbonizing through a Southeast RTO, indicate that such an approach could save ratepayers hundreds of billions of dollars region-wide by 2040 compared to a business-as-usual case. The study, conducted by Energy Innovation and Vibrant Clean Energy, found that:

> The effects of a single restructured wholesale market in the Southeast are dramatic and immediate. In 2025, the year in which the model has fully operationalized the competitive electricity market, the RTO Scenario is approximately $13 billion cheaper in operations and amortized capital costs. By 2040, the cumulative savings of the RTO Scenario is approximately $384 billion, as expensive-to-run coal and gas fired power plants are replaced with more competitive wind, solar, and battery storage.[54]

In other words, if Duke Energy is truly committed to decarbonizing the grid in the Carolinas, rapidly and at least cost, it would behoove the company to, at a minimum, work with independent analysts to model how a regional wholesale

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[53] *Id.*

[54] Affordability Report at 20, citing, Eric Gimon et al., Summary Report: Economic and Clean Energy Benefits of Establishing a Southeast U.S. Competitive Wholesale Electricity Market 9 (Energy Innovation and Vibrant Clean Energy, Aug. 2020), https://energyinnovation.org/wp-content/uploads/2020/08/Economic-And-Clean-Energy-Benefits-Of-Establishing-A-Southeast-U.S.-Competitive-Wholesale-Electricity-Market_FINAL.pdf.

market approach may be able to achieve the company's and the state's goals faster and cheaper than the Company's preferred "own (almost) everything" approach. The Commission might also consider conducting its own such modelling, if only as a reference against which to compare the costs and benefits of the two possible approaches.

V. Conclusion and Recommendations

WHEREFORE, Appalachian Voices respectfully requests, for the reasons outlined above, that the Commission reject the portions of the plan proposed by the Companies that unnecessarily limit the utilization of cost-competitive clean energy resources. The Companies have not demonstrated that the proposed plan utilizes the entire spectrum of demand-side options that result in the least cost mix of achievable generation and demand-reduction measures to meet carbon reduction goals.

Further, Appalachian Voices urges the Commission to require Duke Energy to revise and supplement its Carbon modeling as follows:

1. Define and develop metrics for assessing "affordability" in a manner that describes actual experiences and impacts faced by its residential customers, including adopting the definition of affordability proposed during the Low-Income Affordability Collaborative Sub-team B work process.

2. Revise the proposed Carbon Plan to incorporate and model the affordability and carbon reduction benefits of customer bill assistance and arrearage management programs, low-income weatherization and other energy efficiency investments, and low-income distributed energy and demand reduction investments, and model impacts on low-income customer bills, electricity cost burdens, arrearages, disconnections for

non-payment, and carbon emissions resulting from the avoidance new methane gas generation.

3. Model how a regional competitive wholesale market and legislatively approved, performance-based regulation would impact resource selection and portfolio costs for the Carbon Plan, and by extension, carbon emissions and customer affordability.

4. Model pathways to achieve its carbon and energy target that rely more heavily on offshore wind, demand response, energy storage, distributed solar, and demand-side efficiency, including a broad expansion of programs targeted at LMI customers.

Respectfully submitted this 15th day of July, 2022.

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CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing *Initial Comments* by Appalachian Voices upon each of the parties of record in these proceedings or their attorneys of record by electronic service.

This the 15th day of July, 2022.

LAW OFFICE OF F. BRYAN BRICE, JR.

By: /s/ Catherine Cralle Jones

Catherine Cralle Jones

Counsel for Appalachian Voices