BEFORE THE NORTH CAROLINA UTILITIES COMMISSION
DOCKET NO. E-100, SUB 179

In the Matter of:	)	
Duke Energy Progress, LLC, and Duke	)	**CITY OF CHARLOTTE INITIAL**
Energy Carolinas, LLC, 2022 Biennial	)	**COMMENTS ON CARBON PLAN**
Integrated Resource Plans and Carbon	)	
Plan		

CITY OF CHARLOTTE INITIAL COMMENTS ON DUKE ENERGY PROGRESS, LLC AND DUKE ENERGY CAROLINAS, LLC'S CARBON PLAN

Pursuant to the North Carolina Utilities Commission ("NCUC") Order Requiring Filing of Carbon Plan and Establishing Procedural Deadlines entered on November 19, 2021, and the Order Granting Extension of Time entered on November 29, 2021, the City of Charlotte ("City"), through the undersigned attorney, respectfully submits the following Comments on the Duke Energy Progress, LLC, and Duke Energy Carolinas, LLC, (collectively "Duke Energy") Verified Petition for Approval of Carbon Plan ("Carbon Plan") filed May 16, 2022.

I. INTRODUCTION

The City of Charlotte ("City") is one of Duke Energy's largest customers and also represents a broad customer base of nearly 900,000 residents. Charlotte's City leadership, residents, and elected representatives recognize the growing urgency of addressing climate change and environmental inequities. In June 2018, the Sustainable and Resilient Charlotte by 2050 Resolution was unanimously passed by Charlotte's City Council. This resolution set ambitious municipal and community-wide greenhouse gas ("GHG") emissions reduction goals. Specifically, it states that the City will:

- Strive for all City fleet and facilities to be fueled by 100% zero-carbon sources by 2030, and
- Strive for Charlotte to become a low carbon city by 2050 by reducing GHG emissions to below two tons of CO_2-equivalent per person annually.

Partnership with Duke Energy, coupled with the experienced guidance of the NCUC, will be critical to achieving the City's stated goals.

To achieve these targets, the City worked with Duke Energy and other key partners to develop the Strategic Energy Action Plan[1] (SEAP), which holistically addresses equitable carbon reduction in both City buildings and fleet as well as citywide GHG emissions.

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[1] *Strategic Energy Action Plan,* December 2018. https://charlottenc.gov/CityCouncil/Committees/Documents/Archive%20Doc/Archive%20Doc%20EF/SEAP%20-%20Executive%20Summary%20Full%20Doc%20FINAL.pdf.

To date, Duke Energy has been one of the City's key community partners in implementing SEAP actions. Some achievements of note include: (1) utilization of Duke Energy's Green Source Advantage Program (GSA)[2] for large customers to procure utility scale renewable energy, and (2) partnership with Duke Energy's subsidiary, e-Trans Energy, to electrify the City's bus fleet.

The City's ability to achieve SEAP goals relies on the carbon intensity of Duke Energy's grid mix, and under the existing regulatory structure, Duke Energy and the NCUC have significant influence. The decisions made in this 2022 Carbon Plan process will impact the City's ability to meet its zero-carbon energy and GHG reduction goals.

In addition to influencing the City's energy supply, Duke Energy's 2022 Carbon Plan can also play an essential role in addressing energy burden and to ensure that inequities experienced by low-income Charlotte residents are mitigated rather than exacerbated through the transition to a low carbon economy.

Energy burden is not evenly shared across the Charlotte community as shown in Figures 1 and 2 in the Appendix. According to this recent study, Black households have higher energy expenditures than white households in the US.[3] Coupled with the fact that high energy bills are one reason that people turn to short-term loan products, energy burdens are increasingly contributing to chronic poverty in the United States.[4] Equity is one of the pillars of the City's SEAP and addressing energy burden in Charlotte is an important strategy for achieving a low carbon and equitable future for Charlotte.

The average energy burden for a Charlotte resident is 4.2%, and the City ranks 14th nationally among major cities for highest percentage of energy burdened households. In 2018, the City had over 120,000 households (31% of households) with a high energy burden at or greater than 6%. The City is also one of 17 cities across the nation where more than 25% of low-income households experience severe energy burden above 14%.[5]

The City, Duke Energy, and the NCUC all have a collective responsibility to carefully examine how the decisions made regarding the Carbon Plan will benefit and burden communities, particularly low-income households. Given the City's carbon reduction priorities and its call to action through the SEAP, as well as the specific interest in ensuring the social and economic benefits of a low carbon energy sector are received by

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[2] "Green Source Advantage - Solar Energy Project," City of Charlotte, https://charlottenc.gov/sustainability/seap/Pages/Green_Source_Advantage.aspx.

[3] Eva Lyubich, "The Race Gap in Residential Energy Expenditures," June 2020, https://www.energy.gov/sites/default/files/2022-03/Lyubich%20-%20The%20Race%20Gap%20in%20Residential%20Energy%20Expenditures_0.pdf.

[4] Rob Levy and Joshua Sledge, "A Complex Portrait: An Examination of Small-Dollar Credit Consumers" (Center for Financial Services Innovation, August 2012), https://www.fdic.gov/analysis/cfr/consumer/2012/a-complex-portrait.pdf.

[5] Ariel Drehobl and Lauren Ross, "Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low Income and Underserved Communities" (American Council for an Energy-Efficient Economy), April 2016, https://www.aceee.org/sites/default/files/publications/researchreports/u1602.pdf.

all, the City has reviewed Duke Energy's Carbon Plan and respectfully submits the following comments.

II. COMMENTS

1. **Improve energy efficiency and demand-side management programs to help local governments and customers address affordability and climate concerns.**
   a. **Expand energy efficiency and demand-side management programs, especially for low- and moderate-income residents.**
   b. **Increase the annual energy savings target beyond 1% of full annual retail load to better reflect conditions enabling deeper energy efficiency and demand-side management penetration.**
   c. **Utilize local government connections in communities to inform program design and improve customer participation rates.**

Energy efficiency (EE) and demand-side management (DSM) programs are not only highly effective and cost-competitive grid resources, but they can also tangibly benefit Charlotte residents by lowering customer energy bills and decreasing energy burden. Recognizing that efficiency not only reduces emissions but also saves customers money, the City asserts that expanded EE and DSM programs in North Carolina could provide needed financial relief for low- and moderate-income (LMI) residents. In 2018, 31% and 26% of households in Duke Energy Progress (DEP) and Duke Energy Carolinas (DEC), respectively, spent 6% or more of their income on electricity bills. These high energy burdens are disproportionately shouldered by low-income, Black, and Hispanic households, and are due to factors such as lack of insulation, older appliances, and disproportionate challenges accessing newer energy-efficient upgrades.[6] Accordingly, the development of EE programs could—and should—have significant equity benefits.

Additionally, the City recommends that Duke Energy should achieve energy savings above 1.0% of the full annual retail load as suggested in the draft Carbon Plan. The Carbon Plan's energy savings target is below the performance of many other states and only just meets the national average of states that have energy efficiency resource standards (EERS).[7]

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[6] Ariel Drehobl and Lauren Ross, "Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low Income and Underserved Communities" (American Council for an Energy-Efficient Economy, April 2016), https://www.aceee.org/sites/default/files/publications/researchreports/u1602.pdf.

[7] According to the 2021 State Energy Efficiency Scorecard from the American Council for an Energy-Efficient Economy (ACEEE), North Carolina's 2020 net incremental savings (MWh) is 0.55% of 2020 retail sales, ranking 29th among all states. Weston Berg, Emma Cooper, and Marianne DiMascio, "State Energy Efficiency Scorecard: 2021 Progress Report" (American Council for an Energy-Efficient Economy, February 2022), https://www.aceee.org/sites/default/files/pdfs/u2201.pdf).

The City supports Duke Energy's efforts to modify the cost-effectiveness test, develop an on-bill financing pilot, and engage stakeholders to improve EE measures and programs through the EE/DSM Collaborative and the Low-Income Affordability Collaborative. The City also commends Duke Energy for its work in creating a proposed LMI pilot program for high energy users and is excited to see the benefits of that program once it is implemented.

Duke Energy's Market Potential Study (MPS) (Attachment IV to the draft Carbon Plan) seems to underestimate cost-effective EE and DSM potential in North Carolina. 'Program Potential' inputs are based on historical program participation data. The City recently published its first annual municipal building energy performance benchmarking report and sees this as an opportunity to engage the larger Charlotte community on the benefits of benchmarking. Such programs have been shown to yield an annual energy savings of 2.4% for buildings that regularly benchmark.[8] This data suggests annual energy savings potential is likely greater than the 1% figure described in the Carbon Plan.

In addition, the MPS does not find heating, ventilation, and air conditioning (HVAC) measures to be cost-effective. National Renewable Energy Laboratory (NREL) research shows heat pumps and heat pump water heaters (HPWH) are two of the highest potential efficiency opportunities in North Carolina that are also cost effective (have a negative net cost of conserved electricity).[9] For this reason, the City recommends Duke Energy consider reassessing its EE/DSM analysis and potential annual energy savings. This reassessment should value the contribution of EE/DSM programs by:

- factoring in technology advancement;
- assuming increased customer participation enabled by on-bill financing;
- re-estimating customer participation based on enhanced marketing and program targeting; and
- considering all cost-effective EE/DSM solutions from other reputable studies to evaluate program cost-effectiveness.

The City and other NC local governments are important and willing partners to design, develop, and deliver EE/DSM programs to our respective residents and businesses in multiple ways, including by increasing the uptake and success of utility programs through local networks and targeted outreach, as well as through improving utilization rates of low-income weatherization programming.

2. Retire coal power plants and replace with zero-carbon energy portfolios to reduce ratepayer costs and improve health outcomes.

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[8] "Benchmarking and Energy Savings" (EnergyStar Portfolio Manager, October 2012), https://www.energystar.gov/sites/default/files/buildings/tools/DataTrends_Savings_20121002.pdf.

[9] Electricity EE supply curve for single-family detached housing stock in North Carolina. Eric Wilson et al., "Energy Efficiency Potential in the U.S. Single-Family Housing Stock" (National Renewable Energy Laboratory, December 2017), https://www.nrel.gov/docs/fy18osti/68670.pdf.

a. **Request Duke Energy to rerun its modeling and risk assessment of coal plant retirements and proposed buildout of natural gas to account for potential regulatory risks.**
b. **Explore use of zero-carbon energy portfolios to help ratepayers avoid the associated financial risk of stranded assets.**
c. **Use all source procurement for new generation as well as in determining the optimal replacement resources for coal plant retirements.**

The City's SEAP identifies several goals related to developing and implementing a strategy for deploying low carbon infrastructure generation, one of which aims to reduce the carbon intensity of grid-supplied electricity by >90% by 2045. Consistent with those SEAP goals as well as overarching GHG reduction targets, the City requests the NCUC consider the following recommendations.

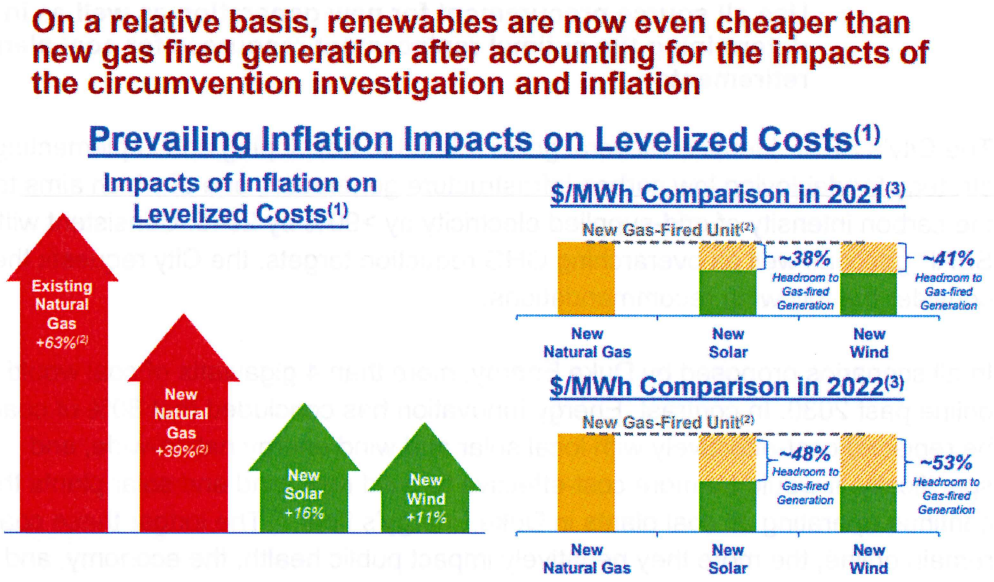
In all scenarios proposed by Duke Energy, more than 4 gigawatts of coal would remain online past 2030. In contrast, Energy Innovation has concluded that 80% of coal could be replaced cost-effectively with local solar and wind energy nation-wide, and specifically, it would be more cost-effective to build new wind and solar plants than to continue operating all coal plants in Duke Energy's fleet.[10] The longer these coal plants remain online, the more they negatively impact public health, the economy, and the climate. In addition, Duke Energy may have omitted potential regulatory risks (such as future carbon taxes or other potential emission regulations) in its modeling, which, if such risks were included, would make the economic case for maintaining these coal plants even less competitive. Therefore, the City urges Duke Energy to include those regulatory risks in a holistic approach to scenario development in this and future Carbon Plan drafts.

Duke Energy has included more than 3 gigawatts of new natural gas by 2035 in all four proposed scenarios to replace some retired coal generation and meet increasing electricity load. This commonality across all four proposed scenarios suggests that a fixed amount of new natural gas is a necessity. As stated in Comment 1, evidence suggests possible underestimation of energy efficiency and renewable energy potential. In addition, although natural gas has experienced low prices in recent history, recent jumps in natural gas prices and elevated forward price curves suggest cost and volatility increases. Conversely, while renewable energy system prices can also shift, general trends show consistent cost declines over time. This is consistent with a recent NextEra study which concluded that, even after accounting for the impacts of the solar panel tariff circumvention investigation as well as inflation, the levelized cost of existing natural gas-

[10] Eric Gimon, Amanda Myers, and Mike O'Boyle, "Coal Crossover 2.0" (Energy Innovation, May 2021), https://energyinnovation.org/wp-content/uploads/2021/05/Coal-Cost-Crossover-2.0.pdf.

fired generation is up 63% in the last year compared to 16% for new solar[11] [12]. Figure 1 below from a recent NextEra presentation to investors depicts this concept.

FIGURE 1: NextEra Presentation on Prevailing Inflation Impacts on Levelized Costs



Additionally, a recent report from the Rocky Mountain Institute found that clean energy portfolios—combinations of renewable energy, efficiency, demand response, and battery storage—are cheaper than more than 80 percent of gas plants proposed to enter service by 2030.[13] As a result, more utilities have canceled gas plants previously proposed to come online. For example, in 2020 (when natural gas prices were at historically low levels), the New Mexico Public Regulation Commission approved a 100 percent renewable + storage replacement for San Juan coal capacity. New Mexico public utility regulators, which like North Carolina, have a legislative mandate to enable transition to carbon free energy, concluded that "on the ratio of capital costs to fuel costs and environmental attributes, the solar-plus-storage option beat out new natural gas additions, making it the superior choice all around."[14]

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[11] Ethan Howland, "NextEra Energy Plans to Cut All Carbon Emissions by 2045, Partly via FPL Adding 140 GW of Solar, Storage," Utility Dive, June 14, 2022, https://www.utilitydive.com/news/nextera-eliminate-carbon-emissions-2045-solar-storage-fpl/625464/.

[12] "NextEra Energy, Inc and NextEra Energy Partners, LP 2022 Investor Conference," Events & Presentations, June 14, 2022, https://www.investor.nexteraenergy.com/~/media/Files/N/NEE-IR/news-and-events/events-and-presentations/2022/06-14-2022/June%202022%20Investor%20Presentation_Website_vF.pdf.

[13] Mark Dyson et al., "The Growing Market for Clean Energy Portfolios," RMI, March 7, 2022, https://rmi.org/insight/clean-energy-portfolios-pipelines-and-plants.

[14] Catherine Morehouse, "New Mexico Approves 100% Renewables + Storage Replacement for San Juan Coal Capacity," Utility Dive, July 30, 2020, https://www.utilitydive.com/news/new-mexico-approves-100-renewable-replacement-for-san-juan-coal-capacity/582557/.

NextEra recently announced that its Florida Power & Light subsidiary will add 92 gigawatts of new solar and 50 gigawatts of new battery storage capacity and achieve zero-carbon emissions by 2045 without increasing its customers' bills.[15] These new solar and storage capacities are orders of magnitude higher than any of the solar and storage capacities proposed across the four scenarios presented in the draft Carbon Plan. This difference in solar and storage capacity between two large electric utilities in the southeast supports the City's view that the proposed scenarios in the Carbon Plan could be reworked to account for several factors described throughout this comment letter (e.g. fully valuing distributed energy resources, enhanced transmission planning).

Based on the issues outlined, the City recommends the NCUC consider requesting Duke Energy to rerun its modeling and risk assessment of its coal plant retirements and proposed buildout of natural gas. Moreover, the City encourages exploration of clean energy portfolios to help ratepayers avoid the associated risk of stranded assets and help Charlotte and other NC local governments meet stated climate and equity goals. When retiring coal plants, the City urges Duke Energy to look at the reinvestment of savings achieved from switching coal to lower cost energy sources into transition assistance to help workers and communities who face important near-term risks and costs in the transition so they can prosper in a decarbonized economy.

Additionally, to ensure the most optimal generation portfolio, including minimizing stranded asset risk and ratepayer costs, the City encourages Duke Energy to use all-source procurement for any additional capacity required.

By allowing a full range of potential resources to compete on equal footing, all-source procurement can create a pathway for renewable energy, EE, DSM, and storage to play a critical role in addressing future energy and capacity needs. Selecting for market-based portfolios of optimal utility-scale and distributed energy resources can capture the value of interaction between resources, drive prices down and benefit consumers. Experiences in multiple states demonstrate that all-source competitive procurement is a proven way to reduce costs for ratepayers while increasing access to cleaner electricity. For example, Xcel Energy Colorado's record-low costs secured by its 2016-2017 all-source competitive solicitation highlights economic benefits of this approach.[16]

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[15] "NextEra Energy, Inc and NextEra Energy Partners, LP 2022 Investor Conference," Events & Presentations, June 14, 2022, https://www.investor.nexteraenergy.com/~/media/Files/N/NEE-IR/news-and-events/events-and-presentations/2022/06-14-2022/June%202022%20Investor%20Presentation_Website_vF.pdf.

[16] Xcel's ASCS returned a $0.0107/kWh bid for wind, a $0.023/kWh bid for solar, and a $0.03/kWh bid for solar-plus-storage. "MI Power Grid Phase II Advanced Planning Evaluator and All-Source Meeting," (Michigan Public Service Commission, February 2021), https://www.michigan.gov/-/media/Project/Websites/mpsc/workgroups/comp-proc/Feb_18_Competative_Procurement_Presentation_.pdf?rev=c0dfd06533714ee9991658e2f8c145f2.

Section 1(1) of Session Law 2021-165 requires that the Carbon Plan should achieve the least cost path to achieve compliance with the authorized carbon reduction goals. Unless otherwise stipulated by existing law or policy, the City recommends all source procurement be used for all new generation as well as in determining the optimal replacement resources for coal plant retirements.

3. **Increase renewable energy procurement and resilience opportunities available to all customers.**
   a. **Include additional detail on envisioned customer renewable procurement options, particularly around program capacity and timelines.**
   b. **Fully account for all benefits provided by distributed energy resources in Carbon Plan modeling.**
   c. **Ensure future transmission planning prioritizes environmental justice and equity concerns and maximizes economies of scale to reduce unit cost.**

The City's SEAP identifies several goals related to equitably decarbonizing buildings as well as developing and implementing resilient innovation districts, all of which would be enabled by increased access to on-site, community, and utility-scale zero-carbon energy.

While the City is thrilled to participate in Duke Energy's Green Source Advantage (GSA) program, and its 35 megawatt GSA project will significantly reduce the City's carbon footprint, additional renewable energy procurement options are needed to achieve municipal and citywide GHG reduction goals. Although Appendix G of the Carbon Plan mentions some "large customer clean energy options," the City would appreciate further detail describing these options, particularly around potential program capacity and timelines, to ensure that these programs will provide the opportunities and tools for the City to meet its ambitious decarbonization goals and timelines. The City is excited and willing to continue working with and supporting Duke Energy in the design and implementation of renewables programs for large energy customers as well as community solar programs.

The City also requests that future renewable energy procurement programs:

- Reflect the decreasing cost of renewable energy by ensuring long-term savings and allow for contractual flexibility (e.g. term lengths); and
- Include mechanisms for enabling LMI customer participation and simplified customer experience; and
- Consider resilience benefits from renewably powered microgrids.

It is important that the Carbon Plan fully accounts for and values all benefits of distributed energy resources (DER), such as local job creation, increased resilience, and reduced GHG emissions. Therefore, the City requests future revisions of this Carbon Plan and drafts of future Carbon Plans include a detailed benefit accounting of DERs

that clearly demonstrates how the benefits of those resources are quantified/monetized in broader Carbon Plan modeling.

Finally, the City understands the concurrent need to transform the grid and its transmission system to enable interconnection of new supply-side resources and encourages the NCUC and Duke Energy to:

- Incorporate equity and environmental justice concerns in future transmission planning and ensure historically underrepresented communities have voice in the planning process; and
- Maximize opportunities to utilize economies of scale and regional coordination with other grid operators to reduce transmission system transformation unit costs.

4. **Prioritize and maximize tested technologies that are commercially viable before stating a need to rely on other technologies that have the potential to carry high risks to ratepayer dollars.**
   a. **Prioritize and maximize proven, beneficial zero-carbon technologies in lieu of technologies not yet commercially viable to save ratepayer dollars.**
   b. **Consider establishing an appropriate minimum technology readiness level be achieved before such technologies are included in Carbon Plan scenarios, or require that Carbon Plans include at least one scenario that omits technologies not yet commercially viable.**
   c. **Ensure equity is appropriately considered in the siting of small modular reactor sites as well as spent nuclear fuel disposal sites.**

The City believes that some of the carbon reduction profiles proposed by Duke Energy rely on technologies that are not yet commercially viable. Specifically, the Carbon Plan assumes hydrogen gas will be widely available and cost-effective to power units that are currently fueled by natural gas and can be blended into gas networks at a sufficiently high percentage to substantially dilute carbon emissions. It does not appear that the cost of necessary retrofits (which can be 10-15% of the cost of building a new natural gas plant) was included in cost assumptions for the Carbon Plan scenarios.[17] Additionally, hydrogen-fired gas turbines that accommodate hydrogen blends greater than 30% are not yet commercially available.[18] If the proposed new natural gas power plants cannot eventually be transitioned to burn 100% carbon free hydrogen, they may become stranded assets and decommissioned years before ratepayers finish paying off the costs to build the plants.

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[17] "Hydrogen Infrastructure – the Pillar of Energy Transition" (Siemens Energy, 2021), https://assets.siemens-energy.com/siemens/assets/api/uuid:3d4339dc-434e-4692-81a0-a55adbcaa92e/200915-%20whitepaper-h2-infrastructure-en.pdf.

[18] "Turbine manufacturers, such as General Electric ("GE"), Mitsubishi and Siemens, have shown success with cofiring hydrogen and natural gas (up to 30% hydrogen by volume) without significant gas turbine revisions in many of the combined cycle and combustion turbine models currently in operation." "Low-Carbon Fuels and Hydrogen," May 16, 2022, https://starw1.ncuc.gov/NCUC/ViewFile.aspx?Id=adab7f1b-4d12-445d-993a-45f8843cd68f.

Multiple Carbon Plan scenarios also rely on more than 500 megawatts of nuclear power from small modular reactors (SMR) by 2035. As an example, the SMR project under development by Nuscale in Utah has not yet received its design certification from the Nuclear Regulatory Commission, even though it has been under development for over a decade.[19] Given the uncertainty of whether SMRs will be commercially and economically viable, the City encourages Duke Energy to prioritize and maximize proven, beneficial carbon free technologies in lieu of technologies not yet commercially viable (preferably through all-source procurement). The City also recommends the NCUC either (1) establish an appropriate minimum technology readiness level (TRL) be achieved before such technologies are included in Carbon Plan scenarios, or (2) require that Carbon Plans include at least one scenario that omits technologies not yet commercially viable.

If SMR does become part of Duke Energy's future generation mix, the City recommends that equity play a leading factor informing the siting of SMR sites as well as spent nuclear fuel disposal sites. Specifically, the City suggests all feasibility studies and other relevant reports articulate how equity concerns were considered and addressed in the siting of such facilities.

5. **Ensure electrical load growth forecasts reflect known and emerging trends in transportation and building electrification.**
    a. **Better forecast and incorporate the long-term load impacts of building code improvements and increased electric vehicle (EV) market penetration to reflect the growing trend toward beneficial electrification.**
    b. **Analyze the impacts of electrification on the electric system and implement best practices for managing load growth and matching increased demand with zero-carbon generation.**
    c. **Further optimize charging behaviors through rate design that incentivizes behaviors beneficial to grid operation such as off-peak charging and Vehicle-to-Grid services.**

The City has a goal of powering its municipal fleet and buildings with zero-carbon sources by 2030, and electrification of those vehicles and buildings is a major contributing factor in achieving that goal. Significant progress has already been made on electrifying its sedan and bus fleet. Additional progress is on the horizon, as the fiscal year 2023 budget includes funding for a new all-electric fire station and an electric fire truck.

The rapid electrification of transportation and buildings represents a significant tool to aid North Carolina in achieving the decarbonization goals set by Session Law 2021-165

[19] "Design Certification Application - NuScale," United States Nuclear Regulatory Commission, February 9, 2022, https://www.nrc.gov/reactors/new-reactors/smr/nuscale.html.

(House Bill 951). As the electric vehicle (EV) market grows and building codes shift to encourage electrification and efficiency, traditional load shapes will also change. It is recommended that Duke Energy analyze the impacts of beneficial electrification on the electric system and implement best practices for managing load growth and matching increased demand with clean, affordable, and reliable generation, so that EVs and appliances such as heat pumps can serve as flexible assets on the grid.

It is recommended that Duke Energy review the Carbon Plan's EV penetration rate to reflect changing market conditions and related federal and state policies, such as Governor Cooper's Executive Order 246, North Carolina's participation in the multistate Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding, and the distribution of Volkswagen Settlement Funds.[20] [21]

EV loads can and should be well utilized to manage system peaks and match renewable energy. Aligning EV charging demand with renewable energy supplies can offer greater grid and decarbonization benefits. Through the Charge Forward pilot program run by Pacific Gas & Electric and BMW, eligible EV drivers agree to delay charging to better align with available renewable energy in exchange for lower charging rates, creating an average of $325 in estimated grid savings annually per vehicle.[22] Researchers also found that smart charging can reduce carbon emissions for EVs by 32% on average, and enable EVs to accept an additional 1,200 kWh of renewable energy per vehicle per year.[23] The City recommends Duke Energy further optimize charging behaviors and thus manage load and integrate more renewable energy sources on the grid through rate design that incentivizes off-peak charging, and explore the potential of Vehicle-to-Grid (V2G) to tap the synergies between EV charging and the operational needs of the grid in ways that maximize the benefits for all customers.

Similarly, the Carbon Plan should forecast and incorporate the long-term load impacts of building code improvements and the growing trend toward beneficial electrification. As widespread electrification adds load, effective demand management will mitigate system costs and aid renewables' integration within a power system that increasingly relies on variable renewable energy. Accordingly, the City recommends Duke Energy plan for consequent increases in electricity consumption early in the planning process, proactively manage growth of building electrification, and support the integration of renewable energy, thus addressing grid and peak load impacts. Such consideration of beneficial electrification could have a positive impact on the cost of the Carbon Plan.

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[20] On July 15, 2020, Gov. Cooper joined a bi-partisan group of 15 states and the District of Columbia in signing a Memorandum of Understanding (MOU) committing to the electrification of medium- and heavy-duty vehicles.

[21] "Volkswagen Settlement," North Carolina Environmental Quality, https://deq.nc.gov/about/divisions/air-quality/motor-vehicles-and-air-quality/volkswagen-settlement.

[22] "BMW ChargeForward." BMW USA, https://www.bmwchargeforward.com/#/home.

[23] "New TSRC Report Shows Benefits of Optimizing EV Charging," Berkeley Institute of Transportation Studies, August 23, 2020, https://its.berkeley.edu/news/new-tsrc-report-shows-benefits-optimizing-ev-charging.

6. Incorporate local government feedback from stakeholder collaborations into the Carbon Plan.

Over the last several years, the City has been actively involved in utility planning processes at the NC Utilities Commission. The City formally intervened in the 2020 Integrated Resource Plan proceeding (Docket No. E-100, Sub 165). The City has also participated in several Duke Energy's stakeholder engagement programs, including but not limited to the Clean Cities Collaborative, the Low-Income Affordability Collaborative, and the NC Energy Regulatory Process (NERP).

The City recommends the NCUC adopt a Carbon Plan that builds upon these collaborative processes and includes recommendations that were the result of the above energy policy and utility planning processes. The City recommends that future collaborations ordered by the NCUC define timelines and outcomes to ensure success, and so the results can be reflected in future Carbon Plans.

III. CONCLUSION

The City has a responsibility for the health, economic well-being, and resiliency of its communities. The long-range plans proposed by Duke Energy will have an impact on the City's ability to meet these responsibilities as well as its own municipal decarbonization goals as set forth in the SEAP. Continuing to rely on fossil fuel-based electricity generation is economically uncertain and leads to adverse health impacts, especially for low-income communities and for people of color.

The City has been collaborating with other North Carolina local governments to review the Carbon Plan to discover more partnership opportunities to collaborate with Duke Energy on advancing shared equity, renewable energy, and GHG reduction goals.

In summary, the City makes the following requests of the NCUC and Duke Energy.

- Improve energy efficiency and demand-side management programs to help local governments and customers address affordability and climate concerns.
- Expand energy efficiency and demand-side management programs, especially for low- and moderate-income residents.
- Increase the annual energy savings target beyond 1% of full annual retail load to better reflect conditions enabling deeper energy efficiency and demand-side management penetration.
- Utilize local government connections in communities to inform program design and improve customer participation rates.
- Retire coal power plants and replace with zero-carbon energy portfolios to reduce ratepayer costs and improve health outcomes.

- Request Duke Energy to rerun its modeling and risk assessment of coal plant retirements and proposed buildout of natural gas to account for potential regulatory risks.
- Explore use of zero-carbon energy portfolios to help ratepayers avoid the associated financial risk of stranded assets.
- Use all source procurement for new generation as well as in determining the optimal replacement resources for coal plant retirements.
- Increase renewable energy procurement and resilience opportunities available to all customers.
- Include additional detail on envisioned customer renewable procurement options, particularly around program capacity and timelines.
- Fully account for all benefits provided by distributed energy resources in Carbon Plan modeling.
- Ensure future transmission planning prioritizes environmental justice and equity concerns and maximizes economies of scale to reduce unit cost.
- Prioritize and maximize tested technologies that are commercially viable before stating a need to rely on other technologies that have the potential to carry high risks to ratepayer dollars.
- Prioritize and maximize proven, beneficial zero-carbon technologies in lieu of technologies not yet commercially viable to save ratepayer dollars.
- Consider establishing an appropriate minimum technology readiness level be achieved before such technologies are included in Carbon Plan scenarios or require that Carbon Plans include at least one scenario that omits technologies not yet commercially viable.
- Ensure electrical load growth forecasts reflect known and emerging trends in transportation and building electrification.
- Better forecast and incorporate the long-term load impacts of building code improvements and increased EV market penetration to reflect the growing trend toward beneficial electrification.
- Analyze the impacts of electrification on the electric system and implement best practices for managing load growth and matching increased demand with zero-carbon generation.
- Further optimize charging behaviors through rate design that incentivizes behaviors beneficial to grid operation such as off-peak charging and Vehicle-to-Grid services.

- Incorporate local government feedback from stakeholder collaborations into the Carbon Plan.

As stated in the *Memorandum of Understanding between the City of Charlotte and Duke Energy Carolinas to Establish a Low Carbon, Smart City Collaboration,* The City is committed to, "...seek to collaborate to make Charlotte a global leader in utilizing low carbon, local, renewable energies, while using data, technology, and collaboration to create a more sustainable and efficient city for all Charlotteans." The City has a successful history of partnering with Duke Energy on energy programs that benefit Charlotte residents, businesses, and local government operations. The City looks forward to and is committed to continue successfully and collaboratively working with Duke Energy to enable solutions that will accelerate a more affordable, clean, equitable, resilient, and reliable energy system. Through continued partnership with the NCUC and Duke Energy, including participation in this Carbon Plan process, we can demonstrate to Charlotteans, North Carolinians, and the nation what collaborative, clean energy leadership looks like.

Thank you for the work done thus far and for the opportunity to provide comments.

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Respectfully submitted, this the 15th day of July, 2022.

OFFICE OF THE CITY ATTORNEY

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CERTIFICATE OF SERVICE

I hereby certify that all persons on the docket service list have been served a true and accurate copy of the foregoing City of Charlotte's Initial Comments on Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's Carbon Plan by hand delivery, first class mail deposited in the U.S. mail, postage pre-paid, or by email transmission with the party's consent.

This the 15th day of July, 2022

OFFICE OF THE CITY ATTORNEY

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Appendix

Figure 1

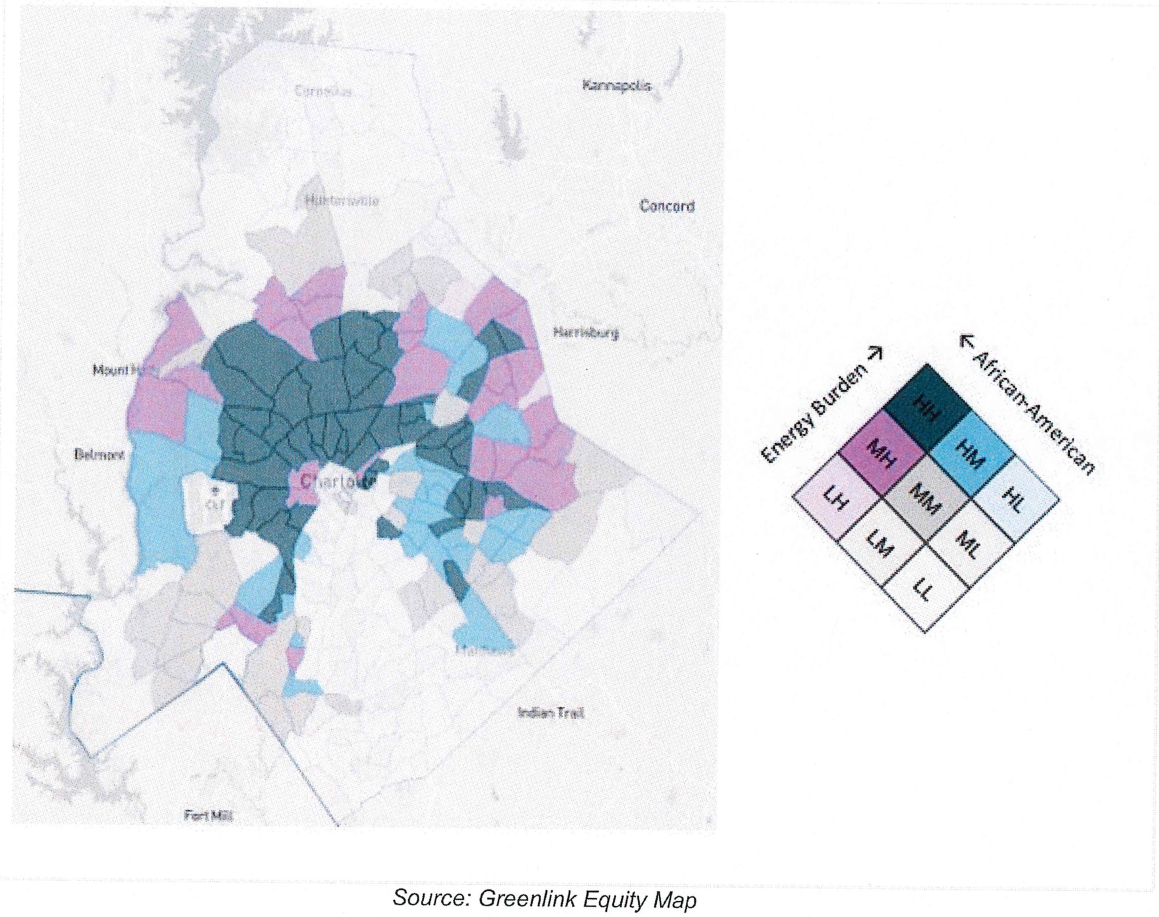
Charlotte Census Tracts that Have High Energy Burdens and Low-Income Populations:

Source: Greenlink Equity Map

Areas in dark gray show the census tracts that are in the top third for both energy burden and low-income individuals. There are numerous low-income neighborhoods in Charlotte that bear high energy burdens.

Figure 2

Charlotte Census Tracts that have High Energy Burdens and Dense African-American Residents:



Source: Greenlink Equity Map

Areas in dark gray show the census tracts that are in the top third for both energy burden and African-American Residents. There are numerous predominantly African-American neighborhoods in Charlotte that bear high energy burdens.