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February 28, 2020

Via Electronic Filing

Ms. Kim Campbell
Chief Clerk
North Carolina Utilities Commission
430 North Salisbury Street
Dobbs Building
Raleigh, NC 27603-5918

RE: In the Matter of: Application of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC for Approval of Proposed Electric Transportation Pilot, *Docket Nos. E-2, Sub 1197 & E-7, Sub 1195*

Dear Ms. Campbell:

Enclosed for filing is a joint partial proposed order submitted on behalf of our clients, the North Carolina Justice Center and Southern Alliance for Clean Energy, as well as intervenors Environmental Defense Fund and the Sierra Club.

The above parties support the ET Pilot, with the proposed modifications articulated in the enclosed partial proposed order. We remain appreciative of Duke Energy for putting forward a proposed electric transportation pilot that considers how to support transportation electrification across sectors. The modifications put forward in the enclosed partial proposed order focus on ensuring equity for lower-income communities and households that otherwise risk being shut out of receiving the direct benefits of these ratepayer funded initiatives. In addition, we are requesting that the Commission order the Companies to put forward new rate designs in the pending general rate cases for EVs that will help to: (1) ensure that vehicle transportation does not lead to costly new generation or grid investments; (2) help put downward pressure on rates; and (3) further reduce the cost of ownership of an EV.

Smart rate designs can help to make vehicle charging more affordable and appealing to a wide array of customers (not just residential customers) and provide a more robust opportunity for the Companies and Commission to learn about what strategies work best for actively and passively managing vehicle charging. At the same time, experience from around the country shows that innovative rate designs are key to putting the least amount of stress on the grid as customers adopt EVs. The Companies' pending general rate cases provide an opportunity to move forward with these suggested new EV-specific rates sooner rather than later.

Tariffed on-bill financing can provide a mechanism to reduce the upfront cost barrier for bus fleet operators at a large scale and at no cost to other ratepayers. It is a model that could also prove to be an equitable method of making EVs more affordable in the residential sector and should be explored by the Companies.

In addition, we recommend that the Commission convene a Stakeholder Advisory Council to oversee all components of the ET Pilot and require quarterly reporting from the Companies.

The proposed order also provides alternatives a number of the first come, first served programs proposed in Duke Energy's application in order to help distribute the direct benefits of those ratepayer funded programs more equitably.

We thank the Commission for considering our partial proposed order.

Sincerely,



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STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-2, SUB 1197
DOCKET NO. E-7, SUB 1195

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of)	JOINT PARTIAL PROPOSED
Application by Duke Energy Carolinas, LLC)	ORDER OF NORTH CAROLINA
and Duke Energy Progress, LLC for)	JUSTICE CENTER, SOUTHERN
Approval of Proposed Electric)	ALLIANCE FOR CLEAN
Transportation Pilot)	ENERGY, ENVIRONMENTAL
)	DEFENSE FUND, AND SIERRA
)	CLUB
)	

BY THE COMMISSION: On March 29, 2019, Duke Energy Carolinas, LLC (“DEC”) and Duke Energy Progress, LLC (“DEP”) (collectively “Duke” or “Companies”) filed a petition for approval of a proposed new electric transportation pilot (the “ET Pilot”). The ET Pilot is intended to increase the market penetration of electric transportation by ensuring that electrification projects benefit all customers, supporting the development of a competitive market for electric vehicle (“EV”) charging services and ensuring customer choice in EV charging technology, and determining how to cost-effectively integrate vehicle charging by actively managing charging loads. To accomplish the ET Pilot’s goals and objectives, Duke proposes to spend \$76 million over three years, to be recovered through base rates, to implement seven programs: (1) a residential EV charging program (“residential EV program”); (2) a fleet EV charging program (“fleet EV program”); (3) an EV school bus program; (4) an EV transit bus charging station program (“EV transit bus program”); (5) a multi-family dwelling

charging station program (“MFD charging station program”); (6) a public level 2 charging station program (“public L2 charging station program”); and (7) a DC Fast Charging (“DCFC”) program.

FINDINGS OF FACT

Based on consideration of the application, initial comments, reply comments, hearing on November 21, 2019, and proposed orders, the Commission concludes that the proposed ET Pilot should be approved with modifications as set forth below:

1. Electrifying our transportation sector comes with numerous and significant benefits for the state’s public health and environment as well as utility customers.

2. If properly managed, increased adoption of electrified transportation in the state has the potential to put downward pressure on rates for all utility customers. It can also provide opportunities to increase the grid’s stability and efficiency while at the same time making it easier to integrate renewable energy into the grid.

3. All citizens will reap the public health benefits of reduced internal combustion engine vehicle emissions and improved air quality from the increased adoption of EVs. EVs produce far fewer greenhouse gas emissions than their gasoline and diesel counterparts on a mile-by-mile basis and produce no localized air pollution. EVs can help significantly improve urban air quality where vehicular emissions are otherwise high and concentrated.

4. There remain major barriers to increased EV adoption in the state, including but not limited to upfront cost barriers, lack of education and awareness, and a lack of sufficient charging infrastructure.

5. Duke's ET Pilot consists of three segments with seven programs that will provide Duke with valuable insight into charging load profiles and opportunities for managed charging. The ET Pilot will also expand the fast charging infrastructure in the state, support public and school transit electrification, and ensure that electrification projects benefit all customers, including those who currently cannot afford the high upfront costs of an EV and related charging equipment.

6. Although Duke proposed to remove two programs from its ET Pilot in its reply comments, the Commission finds that the MFD charging station program and the public L2 charging station program are essential to ensuring that the ET Pilot's benefits are equitably distributed across Duke's customers.

7. Because Duke's ET Pilot is intended to gather insight and information on the impacts of increased transportation electrification, it is appropriate to require strong reporting and oversight requirements during the three-year pilot program.

8. Due to the short three-year duration of the ET Pilot, it is necessary for Duke to report on the ET Pilot on a quarterly basis. In doing so, the Commission and stakeholders will have the opportunity to review results and correct any problems during the Pilot's duration.

9. To advise and guide Duke throughout the ET Pilot, the Commission finds that the establishment of a stakeholder advisory council is appropriate and necessary.

10. To increase awareness and educate customers of the benefits of transportation electrification, it is appropriate to approve a robust education and marketing program as part of the three-year ET pilot.

11. To ensure that all customers benefit from Duke's ratepayer-funded ET

Pilot, it is appropriate to require equitable distribution of the program incentives.

12. This equitable distribution in the residential EV program includes enabling drivers at any income level to clear the upfront cost barrier to charging equipment and establishing car-sharing programs to expand EV access to low and moderate-income customers.

13. To equitably distribute the program incentives, Duke cannot award EV bus program incentives based on a first-come, first-served basis. Otherwise, more affluent communities and school districts would have a greater opportunity to receive direct program benefits while disadvantaged communities and school districts would have less opportunity to receive those benefits. The EV bus programs should be targeted to directly benefit lower-wealth communities and those that experience more severe and frequent transportation-related air pollution.

14. A tariffed on-bill financing option for school districts and public transit agencies can accelerate the purchase and deployment of electric buses and is in the public interest. Tariffed on-bill financing will accelerate this deployment by greatly reducing the upfront cost barrier faced by agencies considering the purchase of electric buses. Building on the targeted rebates that will be offered under the program, tariffed on-bill financing will expand the opportunities for electric bus adoption at scale.

15. The Commission finds that the Cadmus study offered by the Environmental Defense Fund (“EDF”) of the effect on Duke from offering a tariffed on-bill program for the on-board battery and charger of new EV buses for GoTriangle shows the benefits of such a program. Its analysis found that the amount of direct subsidy funds required to overcome the upfront cost barrier facing the transit agency in

planned procurements for new buses would fall by more than 75% if Duke Energy offered a tariffed on-bill program and that doing so would be a more effective method for deploying electric transit buses at scale.

16. Cadmus completed a second study in consultation with Duke to evaluate the cash flows for a tariffed on-bill program for transit buses. The study confirmed that the net cost to Duke to source the capital for the tariffed on-bill program would be zero.

17. In addition to the benefit to Duke Energy and bus fleet operators, the Commission recognizes the benefits to ratepayers to accelerating the deployment of EV buses for transit buses and school buses as described above. Tariffed on-bill financing provides benefits for all stakeholders. In addition, the Commission finds that the availability of a financing tool to accelerate fleet electrification would support the zero-emission vehicle deployment goals specified in Governor Cooper's Executive Order No. 80 and provide more opportunities for low to moderate income ratepayers to receive direct program benefits from the ET Pilot. As noted in the letter of support by the public transit agency GoDurham, supporting transit bus electrification is an important way to ensure that even those ratepayers who cannot afford private vehicles, much less EVs, can benefit from the ET Pilot.

18. Due to the potential impact of electrified transportation on the utility grid, including the exacerbation of peak loads if charging is not appropriately managed, it is necessary and appropriate to require Duke to implement load management mechanisms and smart rate design in the ET Pilot.

19. Duke has long recognized the important role that managing EV charging has in avoiding new peak generating capacity, which will be costly to all ratepayers. For

example, in DEC's prior 2011 EV pilot application, it noted that absent managed charging for EVs, the Company would likely require 89 MW of additional capacity, whereas managed charging of 10,000 additional EVs would require as little as 0.7 MW of additional peak generating capacity. There is no reason for the Companies not to build on the existing information that DEC collected in its previous 2011 EV Pilot and from existing customers who charge EVs to design EV-specific Pilot rates as part of this ET Pilot.

20. Given the Companies' prior experience with customers who charge their EVs on Duke's grid and widely available information about the desirable load profiles of managed EV charging, the Commission finds that it is not necessary to wait until the conclusion of the three-year ET Pilot for the Companies to offer EV-specific rates.

21. While Duke's proposal does include managed charging in several of the Pilot's components, there are opportunities for incorporating additional load management techniques, such as EV-specific time of use (TOU) rates.

22. Absent Pilot EV rates, customers are likely to continue on the standard residential tariff, which does not provide any incentives to charge at off-peak times that would be less costly and less likely to contribute to reduced pollution. An EV-specific time-varying rate (i.e., a TOU rate) will enable EV drivers to receive benefits of cheaper electricity by charging during off-peak times, and will also benefit all ratepayers by reducing potential stress on the grid from new EV load.

23. In addition to these passive managed charging techniques, like TOU rates, the Commission finds that Duke should explore actively managed charging options as well. Unlike passively managing EV load, active managed charging includes

programs that allow the utility or another third party to control vehicle charging. The Commission finds that this ET Pilot is an opportunity for Duke to explore these options across a broad range of customer classes, and therefore orders Duke to develop and implement both active- and passive-managed charging mechanisms for electric transportation.

24. Demand charges incurred by privately owned DCFCs, as well as Level 2 chargers, on existing commercial rate tariffs are a barrier to market participants. Commercial customers on schedule OPT-V (for DEC) or schedule SGS-TOU (for DEP)—those schedules the Companies are proposing to apply to customers that participate in the Fleet EV Charging Program—include demand charges that will create obstacles to adoption, particularly at this early stage of the market. As noted by North Carolina Sustainable Energy Association (“NCSEA”), fleet operators are likely to have more than one EV charging at a time, which could result in excessive demand charges. NCSEA Initial Comments at 13. Because this higher demand would not necessarily coincide with system peak demand (or local stresses on the distribution grid), such demand charges would not reflect cost causation and would become an increased fixed charge that cannot be avoided by better managing charging to lower-cost times of day.

25. It is in the public interest for the Companies to propose pilot EV tariffs for non-residential customers who participate in the EV Fleet Charging Program (or who otherwise provide workplace EV charging or publically accessible DCFC) that have (a) no demand charge; (b) a fixed charge or Basic Facilities Charge that is limited to customer-specific costs; and (c) time-varying energy rates that encourage off-peak charging. Such non-residential Pilot EV tariffs should also be made available to transit

operators and school districts that have acquired electric buses.

26. The Commission finds that North Carolina’s EV charging infrastructure market should be a competitive market, with private companies able to participate and expand EV charging infrastructure. This Order includes conditions to mitigate concerns over Duke’s ownership and operation of EV charging infrastructure in the ET Pilot, including requiring installation of level 2 and DCFCs in disadvantaged areas and key urban areas.

27. The Commission finds it necessary to develop guidelines for utility ownership of charging infrastructure to ensure that any utility-owned EV charging infrastructure is in the best interests of utility customers and does not provide any undue advantages for Duke over other market participants. These guidelines must go beyond ensuring that end-use retail consumers are charged a fair price for EV charging from Duke owned and operated DC fast chargers.

Discussion

A. Reporting and oversight

1. Quarterly and Final Reports

In its ET Pilot Application, Duke proposed to “report operational data and results from the ET Pilot to the Commission on an annual basis, and to prepare a final report with final findings and conclusions.” Application at 8. Duke did not provide specific metrics that it would report, nor did it provide for stakeholder input in its annual reporting.

Several intervenors expressed concerns about the annual reporting proposal. Specifically, Public Staff expressed concerns about the lack of “objectives, metrics,

goals, or other means of evaluating whether the program is a success or failure.” Public Staff Comments at 13. The North Carolina Justice Center and the Southern Alliance for Clean Energy (collectively, “NCJC/SACE”) recommended that the reporting be conducted on a quarterly basis, that the reports include specific metrics so that the Commission and the public may meaningfully assess the Pilot’s progress towards its goals and identify any issues needing resolution. NCJC/SACE Initial Comments at 12-13. The Commission agrees that quarterly reports are necessary due to the short, three-year timeframe of the ET Pilot. Further, specific metrics set forth in the Conclusion section must be included in the quarterly reports to ensure that the reports provide valuable information from which Duke and the Stakeholder Advisory Council (see below) can modify and improve the ET Pilot throughout the course of the pilot term.

Additionally, Duke has proposed to prepare a final report containing final findings and conclusions, although it included minimal language explaining the contents of this final report. Application at 8. To properly evaluate the ET Pilot, Duke’s final report should be robust, fully assess the three-year ET Pilot term and include information necessary to evaluate the success of the programs. However, this final report should also be drafted with the input from the Stakeholder Advisory Council, which is addressed in detail in the next section.

Finally, in its reply comments, Duke offered to “commit to a rigorous Evaluation, Measurement and Verification (‘EM&V’) analysis of the impact of all segments of the ET Pilot to ensure that the goals of the pilot are met.” Duke Reply Comments at 8-9. NCJC/SACE agreed on the importance of conducting a full, independent EM&V process, in which the EM&V contractor would collect qualitative information from user and

program participant and stakeholder interviews, including evaluation of Duke’s outreach efforts. NCJC/SACE Reply Comments at 8-9. Although Duke did not provide additional details about the EM&V process, the independent evaluator should, with the involvement of stakeholders, develop metrics for the ET Pilot, collect qualitative information, and evaluate various components of the pilot programs.

2. *Stakeholder Advisory Council*

In its Application, Duke proposed to “conduct a stakeholder working group to share results and solicit input for future program design” only “[c]oncurrent with the *final* report.” Application at 8-9. Several intervenors, including NCJC/SACE, EDF and Sierra Club, recommended the establishment of a stakeholder advisory group to study and oversee the ET Pilot. NCJC/SACE noted the importance of stakeholder involvement during the three-year pilot program, not merely at the end of the Pilot. NCJC/SACE Initial Comments at 15-16.

The ET Pilot shall be overseen by a Stakeholder Advisory Council comprising stakeholders with relevant expertise who can represent public interests related to equity, affordability, the environment, clean energy, and clean transportation. The stakeholder advisory council should be consulted in the preparation of the final report. Further, as NCJC/SACE recommended, the Stakeholder Advisory Council should communicate directly with the EM&V contractor and be engaged in reviewing Duke’s overall findings both in draft and final form. Finally, the Stakeholder Advisory Council should be involved in Duke’s development of EV-specific rates as set forth in this Order, and should work collaboratively with any additional stakeholder groups convened as part of the pending general rate cases to develop low-income rates and otherwise improve

affordability. The formation of the Stakeholder Advisory Council will assist in guiding and advising Duke throughout the ET Pilot.

B. Education and outreach

One of the main barriers to increased EV adoption is a lack of knowledge and awareness of the benefits and opportunities of transportation electrification. Utilities have an important role to play in educating customers about these benefits and opportunities. Unfortunately, consumers lack basic information about EV policies and incentives, operation and maintenance benefits, adequacy of EV ranges for daily use, and reliability of the technology. Low-income communities are at an even larger disadvantage when it comes to education about the benefits of electrified transportation.

In the ET Pilot, Duke plans to conduct market education and outreach for each program, including electronic communication, direct mail, social media, public events, and mass market advertising. The Company also proposes to use relationships with agencies and organizations to conduct education and outreach. Application at 17. To adequately educate its customers on the benefits of this new and rapidly growing transportation sector, Duke also needs to educate consumers outside of these traditional avenues, such as through partnerships with manufacturers and dealerships. To ensure that disadvantaged communities take full advantage of Duke's pilot, it is also important to reach disadvantaged communities, including through partnerships with new organizations. Therefore, the Commission finds it necessary to require Duke to expand the scope of its traditional outreach to educate customers that it does not typically reach. This expanded reach must include contact with members of disadvantaged communities, either directly by Duke or through organizations focusing on environmental justice and/or

equity.

C. Environmental Justice and Equity

One of the many manifestations of environmental injustice is in the proximity impacts of transportation. Transportation electrification can help reduce proximity impacts, particularly air pollution. To its credit, Duke has set one of the goals of the Pilot as “[e]nsuring[ing] that electrification projects benefit all customers, including those who do not own EVs and low/moderate income customers.” Application at 8. To help alleviate the inequitable transportation impacts and meet one of the goals set forth by Duke itself, the Commission finds that Duke must equitably distribute ET Pilot benefits to ensure that the programs benefit all customers, including low to moderate-income customers.

1. Residential EV Program

Duke proposes to offer residential rebates on a first-come, first-served basis to customers who show proof that they have purchased and installed an EV charging station for their home in exchange for participating in the ET Pilot. Application at Ex. C. Duke’s initial rebate proposal was for \$1,000. Application at 9. But, in response to comments of intervenors, Duke reduced the rebate amount to \$500 in its reply comments. Duke Reply Comments at 11. Duke has failed to produce any evidence to justify either rebate amount. It is unclear whether either number is the correct amount to incentivize customers to participate in the ET Pilot. Accordingly, Duke must demonstrate in a subsequent filing that the amount of the rebate has been calculated at the lowest amount to induce prospective EV buyers to participate in the ET Pilot when they otherwise would not have done so.

Low and moderate income customers likely do not have the resources to purchase an EV and an EV charging station, and thus, they likely cannot participate in the residential ET Pilot. However, the rebates do provide some benefit to utility customers generally, particularly to the extent that the customers receiving rebates will participate in the managed charging aspects of the residential program. To provide a better understanding of customers who enroll in the residential program, Duke should gather demographic information, on a voluntary basis, on those who choose to participate. This information will assist Duke as it gathers information on the program and will inform the Companies in proposing future programs.

There are opportunities for Duke to encourage EV usage among all its customers through innovative programs. First, the Commission will order Duke to explore introducing a tariffed on-bill program for investment and cost recovery for residential EV chargers on terms that assure a path to ownership for participating customers. This option would cover the full upfront cost of installed equipment while also assuring full cost recovery for the utility. Similarly to the use of tariffed on-bill investment to clear upfront cost barriers for EV buses, the net cost to Duke to capitalize tariffed on-bill investments in residential EV chargers would be zero because Duke's cost of capital would be included in the costs recovered through an on-bill cost recovery charge. A program of tariffed on-bill financing for residential EV purchases will facilitate EV adoption at scale and will assure a more equitable distribution of the benefits than limited rebates distributed on a first-come, first-served basis. This financing mechanism is discussed further below in the context of EV bus fleets, but the same general technique could be applied to residential purchases.

Second, as discussed by NCJC/SACE in their initial comments, there are electric car-sharing programs being established in other parts of the country, including the BlueLA program in Los Angeles, California and the Our Community CareShare program in Sacramento, California. NCJC/SACE Initial Comments at 19-20. The Commission finds that low and moderate-income North Carolinians could benefit from a similar car-sharing program. The Commission will order Duke to seek to partner with at least two municipalities in North Carolina to develop car-sharing programs that will primarily serve disadvantaged communities.

2. Distribution on a First-Come First-Served Basis

Duke proposes to distribute several of the ET Pilot incentives on a first-come, first-served basis. For instance, both the school bus program and transit bus program will distribute EVSE on a first-come first-served basis. Application at Exs. E, F. As pointed out by NCSEA, making these investments in this way may result in wealthier school districts and transit systems taking advantage of the rebates and incentives before underserved communities have the opportunity to participate. This result would run directly counter to Duke's stated goal of ensuring that the programs benefit all customers. The residential and fleet programs also offer rebates on a first-come, first-served basis.

Commenters have made recommendations about how to distribute these program benefits. NCJC/SACE requested the Commission to put the burden on Duke to show that it has attempted to allocate the Pilot benefits equitably. NCJC/SACE Initial Comments at 18. NCSEA recommended using scoring criteria to determine which customers received the benefits of the EV school bus and EV transit bus charging station programs, with that criteria being approved by the Commission after notice and opportunity to be heard.

NCSEA Initial Comments at 14-15.

It is important that all of Duke's customers have the opportunity to participate in the ET Pilot programs. Indeed, Duke itself has determined that benefiting all customers is one of its objectives in proposing this ET Pilot. The burden is thus on Duke to determine how to equitably distribute these programs, whether that is through the development of scoring criteria or through some other mechanism.

3. Tariffed On-Bill Program for EV Buses

A tariffed on-bill financing program would allow bus-fleet operators to sign up for a service agreement with Duke in which the utility would capitalize the upfront costs of the on-board battery and charging station for EV buses, essentially the incremental difference between a traditional diesel bus and an electric bus, on terms that assure a path to ownership for participating customers. Duke would then recover those incremental, upfront costs with a charge on the participating bus-fleet operator's electric utility bill, which should be designed to be less than the estimated savings from avoided fuel and maintenance costs for a diesel bus. By spreading out the cost recovery for the upfront costs to span the warranty period for the battery on board the bus, tariffed on-bill financing would allow the timing of expenditures associated with EV buses to more closely mirror the timing of payments that is familiar to diesel fleet owners.

Reducing upfront cost to the fleet owner would magnify the purchase power of public or private funds available from any source. For example, a combination of tariffed on-bill financing, Volkswagen settlement funding, and ratepayer incentives would allow school districts and public transit agencies to procure a much greater number of EV buses sooner than they would otherwise be able to buy new zero-emission buses.

Cadmus completed a second study in consultation with Duke to evaluate the cash flows for a tariffed on-bill program for transit buses, also using GoTriangle as an example. The study confirmed that the net cost to Duke Energy to source the capital for the tariffed on-bill program would be zero because Duke's cost of capital would be included in the project costs recovered through the on-bill cost recovery charge.

The second Cadmus study also found that, for each new EV bus deployed in its service area, Duke Energy would gain new sales from the daily charging of the batteries, regardless of how the procurement of new EV buses is financed. The resulting sales are additional, and they add value to ratepayers in the form of increased grid utilization, which in turn creates a downward pressure on rates. Assuming that the EV buses are charged at the transit agency depot overnight during off-peak periods, Cadmus found that the cost of purchasing the wholesale supply for the new transportation battery loads would be less than the revenue gained from the sale of that electricity at the transit agency's current rate.

Combining the cost of capitalizing the tariffed on-bill program and the cost of supplying electricity for additional sales, the second study by Cadmus specifically for Duke Energy found that the benefit-cost ratio would be 1.11, indicating that the program would be cost effective.

The Cadmus study of the effect on Duke Energy from offering a tariffed on-bill program for the on-board battery and charger of new EV buses for GoTriangle shows the benefits of such a program. Its analysis found that the amount of direct subsidy funds required to overcome the upfront cost barrier facing the transit agency would fall by more than 75% if Duke Energy offered a tariffed on-bill program.

As a result of the reduction in subsidy funds required, the transit agency could leverage the state, federal, and ratepayer funds to more than quadruple the number of EV buses it could buy. For example for an amount of \$4.7 million in public funds over the period of 2020 to 2023, the agency could buy 15 new EV buses. By contrast, if Duke Energy offered a well-designed tariffed on-bill program, it would be able to buy 56 new EV buses over the same four year period with the same amount of funding.

In addition to the benefit to Duke Energy and bus fleet operators, the Commission recognizes the benefits to ratepayers to accelerating the deployment of EV buses for transit buses and school buses as described above. Tariffed on-bill financing provides benefits for all stakeholders. In addition, the Commission finds that the availability of a financing tool to accelerate fleet electrification would support the zero-emission vehicle deployment goals specified in Governor Cooper's Executive Order 80.

D. Managed Charging through Rate Design

1. Time-Varying Rates

Left unmanaged, electric vehicles draw power at predictable times. For instance, in the residential class, EV owners tend to plug in their vehicles in the evening after they arrive home from work. Charging during the early evening can exacerbate the peak demand period, and could thereby increase a utility's load, which can lead to the need for new power generation or increased investments on local distribution grids. Sending clear price signals through rates can shift vehicle charging to less expensive, off-peak times of the day. Rate design can send these price signals for many of the pilot's programs. Throughout the country, time-of-use rates—one option to manage charging—have been proven to be effective at shifting EV charging away from peak periods.

The ET Pilot includes elements of active and passive managed charging. In the proposed residential EV component, the utility will test utility management of charging through load control events. Application at Ex. C. In the EV school bus component, Duke has proposed to test “load management capabilities to reduce charging speeds, up to and including full curtailment and Vehicle-to-Grid (V2G) bi-directional power flow.” *Id.* at Ex. E. Customers partaking in the fleet EV and transit bus programs must take service on an applicable TOU rate. To ensure that the ET Pilot tests a variety of rate design mechanisms to inform future tariffs, the Commission finds it beneficial for Duke to develop and implement additional managed charging mechanisms in the ET Pilot.

Public Staff and several intervenors, including NCJC/SACE, Sierra Club, EDF, Greenlots, ChargePoint, and NCSEA raised concerns about the lack of immediate plans to offer EV-specific rates. For instance, when discussing the residential and fleet EV components, Public Staff states that additional rate designs should be tested “to evaluate the extent to which various rate designs impact customer usage and promote, or inhibit, managed charging.” Public Staff Comments at 10. Public Staff also argues that a “robust pilot project should evaluate passive managed charging through experimental rate designs and other mechanisms.” *Id.* Greenlots encouraged the Companies and the Commission to find ways to incorporate and evaluate smart charging and other load management strategies to a greater degree than put forward in Duke’s application. Greenlots Initial Comments at 15-16. EDF noted the importance of piloting managed charging to manage load beyond what Duke had already proposed, such as with the Fleet EV program and the EV Transit Bus program. EDF Initial Comments at 9-11. EDF requested that the utilities convene a stakeholder process to develop and test EV-optimized rate designs as part of

the Pilot and the Companies' long-term transportation electrification strategy. *Id.* at 18. ChargePoint supported these recommendations and asked that the Commission open an inquiry into beneficial rate designs for supplying EV charging that will result in greater grid benefits and optimized charging activities. ChargePoint Reply Comments at 14.

a. Residential EV Program

Several commenters and Public Staff commented on the need to incorporate managed charging and other “smart” rate design for residential EV customers. Public Staff states that “[a]s 80% of residential EV owners charge at night, any pilot project should explore the vast array of mechanisms to determine what drives, and does not drive, customer behavior.” Public Staff Comments at 10. NCJC/SACE urged the Commission to require Duke to develop and implement an EV-specific time-varying rate for residential customers. NCJC/SACE Initial comments at 31-33. Similarly, Sierra Club urged Duke to collect and evaluate data on metering capabilities of smart charging equipment to use as support for an EV-specific time-of-use rate. Sierra Club Initial Comments at 2. NCSEA requests that the Commission direct Duke to propose EV-specific rate tariffs in its next general rate case filings and address EV rate design in a generic proceeding. NCSEA Initial Comments at 13.

Given the benefits to ratepayers associated with not exacerbating peak demand, and the ability to experiment with rates in this Pilot, the Commission will order Duke to develop and implement passive managed charging mechanisms for residential customers during the ET Pilot, either through EV-specific TOU rates or other experimental rate designs. These rate designs are in addition to the active managed charging that Duke has

proposed in its ET Pilot.

b. Multi-Family Dwelling Program

In Duke's Multi-Family Dwelling ("MFD") program, customers will be billed according to the Small General Service schedule, with an additional \$0.02/kWh to cover additional fees. Application at 13-14. This is a flat rate that does not encourage customers to shift charging to off-peak times. Because MFDs are residential in nature, charging times and usage at MFD charging stations will likely be similar to charging at residential homes, where rate design can effectively shift usage. Duke should develop and implement a pilot time-varying rate to incentivize charging during off-peak time periods and/or when clean, low-cost renewable energy is abundant. At the same time, Duke must develop and implement a pilot active managed charging program for a subset of the MFD chargers.

c. Fleet EV Program

To receive the \$2,500 incentive, Duke's Fleet EV Program requires customers to take service under either Schedule OPT-V in DEC territory or Schedule SGS-TOU in DEP territory. Application at 36. While the ET Pilot requires participants to take service under TOU rates, Duke has not evaluated whether there are specific opportunities to shift the timing of fleet EV charging to minimize the overall cost to serve and minimize pollution from electric generation to the greatest degree practicable. Duke needs to develop and implement EV-specific passive time-varying rates, such as an EV-specific TOU rate, to ensure that fleet EV charging does not exacerbate the utilities' peak demand. There are also opportunities to actively manage fleet EV charging, in similar ways to Duke's proposal to actively manage charging in the residential EV program. The

Commission finds it beneficial for Duke to study, develop and implement a pilot EV-specific rate design that actively manages charging in addition to the passive time-varying rate.

d. EV Bus Programs

Duke's EV school bus and transit bus programs similarly lack managed charging or rate designs that are specifically targeted at electric buses. Duke's EV school bus program does include an active managed charging component, in which Duke will explore vehicle-to-grid power flow. Application at Ex. E. Duke's EV transit bus program requires customers to take service under a TOU rate. However, because transit bus usage will differ from school bus usage, Duke should also explore active managed charging for transit buses. Further, Duke should develop and implement pilot EV-specific time-varying rates for buses as well to determine the extent to which it is possible to shift electricity usage to non-peak periods.

2. *Demand Charges*

Non-residential customer tariffs typically include demand charges, which are often based on the customer's maximum demand during a month. Often, this demand charge is measured based on the customer's peak demand regardless of when that demand occurs, and therefore is not based on the customer's coincident peak demand. All demand charges, but particularly the non-coincident peak demand charges "pose a significant challenge to the economics of EV charging, particularly at commercial and public charging locations."¹ Charging electric vehicles can result in high demand

¹ David Farnsworth, et al., Regulatory Assistance Project, Beneficial Electrification of Transportation 67 (Jan. 2019), <https://www.raponline.org/wp-content/uploads/2019/01/rap-farnsworth-shipleysliger-lazarbeneficial-electrification-transportation-2019-january-final.pdf>.

charges, because the charging stations tend to use a high number of kilowatts at one time, when vehicles are charging.

The ET Pilot may result in negative experiences for customers who participate in the program if they are subject to expensive demand charges. This is of particular concern considering that these demand-charges are not necessarily reflective of the cost to serve EV charging load as they are imposed regardless of their contribution to congestion on the local grid or system peak.

a. Fleet EV Program

As stated in the above section discussing the fleet EV program, customers receiving rebates in this Pilot component must take service under Schedule OPT-V or Schedule SGS-TOU. Application at Ex. D. Both of these rate schedules include demand charges in addition to volumetric charges.

Several commenters expressed concerns about the impact that demand charges may have on ET Pilot participants and others who own and operate charging stations. NCJC/SACE described the various reprieves that utility commissions around the country are granting, such as the California PUC's five-year demand charge holiday for Southern California Edison's proposed commercial EV rates. NCJC/SACE Initial Comments at 35. EDF recommended that Duke revise its application to include a demand charge mitigation plan during the Pilot, noting that demand charges from EV charging can have a disproportionate impact on a customer's electric bill. EDF Initial Comments at 12-14. NCSEA focused on the fleet EV program, noting that the TOU rate schedules under the fleet EV program include demand charges that "can be extremely problematic for customers and makes managing bills extremely difficult." NCSEA Initial Comments at

13.

During the term of the ET Pilot, Duke should not subject EV fleet customers to demand charges. In addition, to ensure that customers are not harmed by these demand charges, Duke is required to study the implications of current demand charges and rate structures on future EV fleet customers to determine how demand charges will potentially impact them. Duke shall present the results of this study to the Commission in a separate filing prior to imposing demand charges on EV fleet customers.

b. EV Bus Programs

There are similar concerns over the effects of demand charges on school districts and transit agencies that participate in the EV bus programs. EDF recommends that Duke offer those participating in Pilot programs service under new EV rates. EDF Initial Comments at 9-11. It argues that these rates should incentivize off-peak charging, should include more than one TOU rates structure to determine the effect of shorter peak periods and higher cost differentials between on- and off-peak, and should include rates with and without demand charges. *Id.* Sierra Club recommends that Duke provide an inventory of their existing commercial and industrial rates that may apply to charging to medium- and heavy-duty vehicles, and then evaluate those rates to determine whether reform or replacement of such rates is necessary to support charging use cases. Sierra Club Initial Comments at 2.

In the ET Pilot's School Bus Program, Duke will install and own the EVSE for those who participate in the program. Duke also seeks to fund up to \$215,000 per EV school bus with bi-directional power flow capabilities. In the ET Pilot's Transit Bus Program, Duke will install and own the EVSE selected by the transit agency. However,

neither program requires that the customers take service under a specific rate schedule. The school bus program requires that usage “be billed under the applicable general service schedule . . . for the Billing Demand and kilowatt-hours registered or computed by or from Company’s metering facilities during the current month.” Application at Ex. E. The transit bus program requires that customers take service under the applicable TOU service schedule and other riders “for the Billing Demand and kilowatt-hours registered or computed by or from Company’s metering facilities during the current month.” *Id.* at Ex. F.

Depending on the rates that school district and transit agencies take service under, demand charges could adversely affect them. EV charging equipment for buses demand a large amount of electricity, and customers may need to charge multiple buses at one time. Through its ET Pilot, Duke should be testing various rate mechanisms to determine the best options for school districts and transit agencies. Duke needs to also mitigate demand charges, either through implementation of a demand charge holiday or through various mechanisms, to ensure that customers are not being adversely affected by participating in the Pilot program.

c. DCFC Program

Duke proposes to install, own and operate 120 fast chargers across 60 locations to create a foundational level of charging infrastructure. The charging equipment will have electrical demand requirements of at least 100 kW. Application at Ex. I. As stated by Duke in its application, one reason why it says it needs to own and operate DCFCs is because “the market for public fast charging in North Carolina is limited, with only three commercial operators charging drivers a fee for the service.” *Id.* at 16.

One of the major concerns for third-party DCFC companies is the effect that demand charges can have on the success of their business. While demand charges may not affect Duke's ability to own and operate its DCFCs, they could hamper competition from other charging infrastructure companies. Demand charges can significantly impact customers who choose to install DCFC equipment at their business. DCFCs can use as much as 50 kW when charging a single electric vehicle. However, because of the currently nascent EV market, these DCFCs are not being used enough to make up for the high demand charges that a DCFC owner must pay. Duke, being the owner and operator of the DCFCs that it proposes, will not be burdened with these high demand charges in the same way as other DCFC owners. To ensure competition within the market, Duke must ensure that third-party DCFC owners are not disadvantaged because of costly demand charges.

E. Competitive Market for EV Charging Infrastructure

Several intervenors expressed concern with maintaining a competitive market for EV charging infrastructure. ChargePoint noted multiple ways in which the Companies could obtain an unfair market advantage, including picking prime locations, having ratepayers subsidize the deployment of Duke-owned DCFC stations, and otherwise have the effect of slowing other entrants into the DCFC market. ChargePoint Initial Comments at 11. NCSEA noted similar concerns, indicating that Duke's presence in the market could slow technological and business model innovation. NCSEA Initial Comments at 12. The North Carolina Clean Energy Business Alliance ("NCCEBA") noted that the Companies would have a structural advantage over other market participants because ratepayers are funding their build-out of DCFC stations and they

would thus not face the same risks as other DCFC providers. NCCEBA Initial Comments at 6. Electrify America expressed concern about the fees that the Companies' DCFC would charge retail EV customers, noting that it would not ensure that Duke's pricing would not effectively undercut the private market. Electrify America Comments at 5.

The Commission recognizes these concerns, but ultimately finds that Duke's overall presence in the EV charging infrastructure market will not give it an undue advantage at this time. As noted by NCJC/SACE, according to independent projections of likely DCFC growth, the Companies would own about 20% of the DCFCs in the state by 2025 if they built the number indicated in their application for the ET Pilot. NCJC/SACE Initial Comments at 40-41. However, to mitigate these concerns, the Commission will direct the Companies to (1) locate in disadvantaged communities at least 10% of the Level 2 charging stations that they install, own and operate; (2) make DCFCs available in urban areas that can serve car-sharing or ride-hailing programs; and (3) develop a competitive fee for charging at the DCFCs that does not confer an unearned advantage to Duke.

F. Commission Guidelines for Utility Charging Infrastructure Investments

Duke will install, own and operate the majority of the charging infrastructure in the ET Pilot, including the charging infrastructure for the school bus component, the transit bus component, the multi-family dwelling components, the public level 2 charging component and the DCFC component. For purposes of this limited Pilot, the Commission will approve Duke's ownership and maintenance of the charging infrastructure. NCJC/SACE recommend that the Commission adopt a standard of review

for weighing proposed utility investments in EV charging infrastructure and ensuring that the utility investments are in the public interest. The Commission agrees with this recommendation, and will open a separate docket to consider, develop, and implement specific guidelines on utility investments in EV infrastructure.

CONCLUSIONS

IT IS, THEREFORE, ORDERED as follows:

1. That the ET Pilot is hereby approved subject to the conditions below.
2. That the ET Pilot shall be subject to the following oversight.
 - a) Quarterly Reporting: Duke shall submit quarterly reports that include at a minimum the following measureable metrics:
 - i. the status and locations of charging stations deployed for each ET Pilot component;
 - ii. a list of anticipated charger installations, including type of charger, location, and expected installation date;
 - iii. any charger replacements and the reasons for replacement;
 - iv. the accuracy of Duke's measurement of the electricity consumed by a customer's EV in each program;
 - v. the accuracy of the EV portion of a customer's bill;
 - vi. program expenses by time period and market segment;
 - vii. participation in the residential program by income bracket and other demographics;
 - viii. managed charging data, including Duke Energy's ability to control charging stations remotely, the aggregate effect of managed

- charging of EVs on peak load, and its effect on local grid constraints;
- ix. usage rate by charger type;
 - x. charging load profiles of residential, fleet, and school and transit bus participants;
 - xi. charging rates;
 - xii. proportion of EV charging taking place under different rates;
 - xiii. data on the load control events for the residential EV component;
 - xiv. estimates of avoided or increased emissions;
 - xv. customer satisfaction;
 - xvi. Duke's perception of the program's successes and challenges to date; and
 - xvii. any changes to the program that Duke Energy has made or plans to make.
- b) Final Report: Duke shall submit a final report that assesses the ET Pilot's full three-year term and includes, in addition to the information required in a quarterly report, holistic information necessary to evaluate the success of the ET Pilot and determine changes to make for future ET programs. This information shall include, at a minimum:
- i. a comparison of the energy used by customers who participate in the ET Pilot with customers who own and operate some form of EV but did not participate;
 - ii. a comprehensive report of the avoided cost, avoided emissions,

- and other impacts of demand management; and
- iii. a report on the program's impact on air quality in areas that are disproportionately burdened by air pollution from transportation.
- c) The quarterly reports and final report shall be made publicly available and easily accessible on Duke's website.
- d) Stakeholder Advisory Council: The ET Pilot shall be subject to oversight by a Stakeholder Advisory Council to be convened by the Commission by subsequent order. The Council shall review the quarterly reports on the ET Pilot, shall have the power to request additional information from Duke, will be involved in the development of EV-specific rates to be filed in the ongoing rate cases, and may recommend to the Commission changes to the ET Pilot to be implemented during the ET Pilot or after it concludes. The Council shall also review and have the opportunity to comment on Duke's final report.
- e) Evaluation, Measurement and Verification process: Duke must undertake an independent evaluation, measurement and verification process, with a specific line item in the budget for the third party evaluator. The Stakeholder Advisory Council will work with the Evaluation, Measurement and Verification contractor.
3. That Duke shall proactively promote the ET Pilot's programs through education and outreach targeted to customers. Duke shall demonstrate that it has proactively contacted members of disadvantaged communities, either directly or through organizations that specifically work on issues of environmental justice

and equity or energy burden.

4. That the ET Pilot shall incorporate principles of environmental justice and equity by including the elements set forth below in ¶¶ 5-10. In addition, for the EV School Bus and EV Transit Bus components, the ET Pilot shall dedicate resources specifically to reaching disadvantaged communities as set forth below.
5. That the Residential EV Charging Program shall include the following features.
 - a) Duke shall collect limited, anonymized demographic information on a voluntary basis from participating customers in an effort to evaluate the degree to which the ET Pilot reaches disadvantaged customers. The collection of this information will also be valuable in informing future programs.
 - b) Duke shall seek to partner with at least two municipalities in North Carolina to develop car-sharing programs that will primarily serve disadvantaged communities. Duke shall include status updates on this effort in its quarterly and final reports.
 - c) Duke may offer residential customers rebates for charging equipment, but only after it has demonstrated in a subsequent filing that the amount of the rebate to be offered has been calculated to induce a significant proportion of prospective EV buyers to purchase EVs when they otherwise would not have done so, although in no event may the amount of the rebate exceed the purchase price of the charging equipment.
 - d) Furthermore, Duke shall explore using tariffed on-bill financing (discussed in more detail below) in addition to or eventually in place of

rebates to improve access for residential customers.

6. That the EV School Bus Charging Station Program shall include the following features.
 - a) Duke shall proactively target the program to school districts whose pupils are disproportionately burdened by transportation-related air pollution rather than making it available to school districts on a first-come-first-served basis. Duke shall file its proposed methodology for identifying how it will allocate the benefits of the ET Pilot equitably within three months of this Order.
 - b) Duke shall increase the school-bus rebate for low-income school districts as defined by the Department of Public Instruction as necessary to ensure that the total cost of ownership to the school district of a new electric school bus under the program does not exceed the total cost of ownership to the school district of a new diesel bus of the equivalent type on the state contract.
7. That the EV Transit Charging Station Program shall include the following features. Duke shall proactively target the program to serve residents of municipalities who are disproportionately burdened by transportation-related air pollution rather than making it available to transit operators on a first-come-first-served basis. Duke shall consult with the Department of Environmental Quality and Department of Transportation to identify those transit operators that are located in areas that have experienced significant numbers of days of nonattainment for ozone or fine particle pollution or that otherwise experience

significant numbers of poor air quality days resulting in part from transportation-related air pollution. Duke shall file its proposed methodology for identifying how it will allocate the benefits of the ET Pilot equitably within six months of this Order.

8. Duke shall develop a tariffed on-bill investment program to address the incremental upfront cost of electric buses, meaning those costs that exceed a comparably sized diesel bus, and the charging equipment that connects electric buses to the grid and allows the utility to recover those incremental upfront costs from the participating customer over time with a tariff on the participating customer's bill on terms that assure a path to ownership for participating customers. Duke shall file an application with the Commission within three months of this Order seeking approval of the tariffed on-bill program in the pending general rate cases, which shall contain the following criteria:
 - a) This tariff will be open to any bus fleet operator, publicly or privately owned, that operates transit or school bus services on behalf of a division of local or state government, including public school systems.
 - b) The utility will establish a terms of service agreement (the tariff) for investing in the incremental upfront costs of the battery and necessary charging stations for new EV buses sought by the participating bus fleet operator in its service area. The Companies should evaluate using the Pay As You Save[®] or PAYS[®] system in order to design a tariff for site-specific investment and cost recovery based on prior experience with other applications. Under this system, the bus fleet operator opts into the tariff,

which allows the utility to put an additional cost-recovery charge on the participating bus fleet operator's monthly electric bill. The cost-recovery charge is capped at a level below the estimated savings (relative to the cost of diesel fuel and maintenance for a diesel bus) and at a level that allows the utility to recover its costs within the warranty period of the equipment (bus battery and charging infrastructure) that it has financed through the tariff. If the equipment has been maintained as per warranty conditions, the utility can call on the warranty to address upgrades that need repair or remedy.

- c) The participating bus fleet operator has no loan, no lien, and no debt associated with this transaction. When the utility recovers its costs from a participating bus fleet operator, the monthly charge for that participating customer ends. When the bus fleet operator has exhausted a battery used for on-board storage, the utility may offer to buy battery packs for second life applications for stationary storage on its grid.
9. That Duke shall ensure that at least ten percent of the chargers deployed under its Multi-Family Dwelling Charging Station Program and its Public Charging Station Pilot are deployed in economically disadvantaged communities.
10. That Duke's Fast Charging Program shall include the following features.
- a) Duke shall develop a competitive fee for charging at the DCFC chargers deployed under this program that incorporates all operating costs that a third-party competitor would incur—including any demand charges—and does not confer unearned advantage to Duke.

- b) At least two of the charging stations in the program shall be deployed in urban areas at locations designed to serve car-sharing or ride-hailing drivers. Duke shall include usage data for these stations in its reports.
11. That the ET Pilot shall include pilot EV-specific rates for each program.
- a) Duke shall develop target rates that seek to conform participating customers' actual load profiles to target load profiles that minimize the overall cost to serve and minimize pollution from electric generation to the greatest degree practicable. Duke shall submit proposed rates and the underlying methodology in the pending general rate cases, Docket Nos. E-7, Sub 1214 and E-2, Sub 1219, within three months of this Order.
 - b) At a minimum, the pilot rates shall include, in equal proportions, a control group and at least one EV-specific time-varying rate. The Residential EV Charging Program, Multi-Family Dwelling Charging Station Program, Fleet EV Charging Program, and EV Bus Program shall also include at least one rate based on actively managed charging.
 - c) Duke shall not incorporate demand charges into EV-specific rates, nor, for any EV-specific rates in which the EV load is sub-metered, shall any demand charges from the customer's otherwise applicable rate schedule be applied. For each program, Duke may apply to convert this prohibition into a demand-charge holiday of a duration to be determined by the Commission, after showing that EV-specific demand causes disproportionate costs regardless of EV-specific rate and other demand-reduction mechanisms and incentives.

d) Duke's proposed pilot EV-specific rates for the Residential EV Charging Program and the Multi-Family Dwelling Charging Station Program shall include low-income EV-specific rates that are reduced consistently with any low-income rates developed in the low-income and affordability stakeholder process recommended by Duke Energy North Carolina President De May in the pending general rate cases referenced above. That low-income/affordability stakeholder process should consider the potential for including an EV-specific component to a low-income rate design.

12. The Commission will open a separate docket to develop and issue guidelines for future utility ownership and investments in electric vehicle charging equipment.

ISSUED BY ORDER OF THE COMMISSION.

This the ___ day of _____, 2020.

NORTH CAROLINA UTILITIES COMMISSION

Kim Campbell, Chief Clerk

CERTIFICATE OF SERVICE

I certify that the parties of record on the service list have been served with the Joint Partial Proposed Order on Behalf of the North Carolina Justice Center, Southern Alliance for Clean Energy, Sierra Club, and Environmental Defense Fund either by electronic mail or by deposit in the U.S. Mail, postage prepaid.

This the 28th day of February, 2020.

/s/ Nicholas Jimenez
Nicholas Jimenez
On behalf of *North Carolina Justice Center and
Southern Alliance for Clean Energy*

/s/ Matthew D. Quinn
Matthew D. Quinn
On behalf of *Sierra Club*

/s/ Daniel J. Whittle
Daniel J. Whittle
On behalf of *Environmental Defense Fund*