BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

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

In the Matter of: Application by Duke Energy Carolinas, LLC and Duke Energy Progress, LLC for Approval of Proposed Electric Transportation Pilot	))))))	**INITIAL COMMENTS OF SIERRA CLUB**

In order to achieve the statewide greenhouse gas emissions reduction goal set forth in Governor Cooper's Executive Order No. 80 ("EO 80")—a reduction of forty percent below 2005 levels by 2025—North Carolina must move rapidly to advance transportation electrification. Therefore, Sierra Club supports the electric transportation pilot ("ET Pilot" or the "Pilot") proposed by Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress ("DEP") (collectively, the "Companies") and provides these comments to highlight the benefits of transportation electrification for North Carolina and to recommend certain minor modifications that would help maximize the Pilot's benefits. The impacts of climate change—from increases in extreme storms, flooding, heat waves, and drought—already are being felt in North Carolina and beyond. As the threat of climate crisis looms, the Companies are in a unique position to lead our state to a clean energy future. Electrification of the transportation sector, paired with decarbonization of the electric grid, is a necessary component of this transition and, thus, a proper place for ratepayer investment.

The ET Pilot includes a modest portfolio of proposed programs that would support electrification of three market-ready electric vehicle ("EV") technologies: electric cars, electric school buses, and electric transit buses. For electric cars, the ET Pilot would address a key barrier to electrification by deploying charging stations for three core infrastructure categories—

home charging, public charging, and corridor fast charging; for electric buses, the Pilot would help overcome the barriers of upfront infrastructure and vehicle cost, which remain obstacles despite lower total costs of ownership. In addition, the integration of new EV load for grid and customer benefit would help North Carolina realize the many benefits of transportation electrification sooner rather than later. Sierra Club applauds the Companies for designing programs that will hasten electrification of the transportation sector and lead to benefits across the state, and we urge the Commission to approve the ET Pilot subject to the minor modifications described in detail below and summarized here:

- The Companies should clarify their data collection plan, issue quarterly reports, and establish a robust stakeholder advisory process;
- For the Residential EV Charging Program, the Companies should: (1) collect and report data regarding managed charging response events and customer participation; and (2) collect and evaluate data regarding the metering capabilities of smart charging equipment as support for a separately-metered, EV-specific time-of-use rate, which rate the Companies should develop during the duration of the Pilot;
- For the Fleet EV Charging Program, the Companies should clarify the types of vehicles eligible for the program and the availability of multiple rebates to a single entity;
- For both EV Bus Charging Programs, the Companies should provide an inventory of their existing commercial and industrial rates that may apply to charging of medium- and heavy-duty vehicles and those rates should be evaluated to determine whether reform or replacement of such rates is necessary to support charging use cases;
- For the Multi-Family Dwelling Unit Charging Program, the Companies should evaluate options for incentivizing off-peak charging;
- For the DC Fast Charging Station Program, the Companies should report the prices charged to EV drivers at DCFC stations;
- For the Public Level 2 Charging Station Program, the Companies should evaluate co-locating some Level 2 and DC fast charging stations in order to create community charging hubs in more densely populated areas; and
- The Companies should develop additional solutions directed at improving access to clean transportation options for low and moderate-income communities and those communities that have been disproportionately overburdened by air pollution from fossil fuel-burning vehicles.

I. Transportation electrification will benefit the Companies' customers and North Carolinians.

Done right, widespread transportation electrification will benefit all utility customers and North Carolinians generally. MJ Bradley and Associates estimate that a mass market for EVs consistent with meeting long-term greenhouse gas reduction goals could provide cumulative benefits of $6.9 billion to North Carolina.[1] Of those total net benefits:

- $1 billion would accrue to electric utility customers through reduced electric bills; and
- $5.9 billion would accrue directly to North Carolina drivers through reduced annual vehicle operating costs.

The potential billion dollars in reduced electric bills resulting from improved utilization of the grid estimated by MJ Bradley study is directionally consistent with numerous analyses conducted by other industry experts, including The National Research Council of the National Academies,[2] Pacific Northwest National Laboratory,[3] and Energy and Environmental Economics (E3).[4] Like MJ Bradley, these experts have also concluded that electricity system benefits are maximized where EV charging is managed to occur at off-peak times.

While a potential billion dollars in grid benefits is squarely within the Commission's traditional regulatory purview, the larger $5.9 billion in reduced fuel and maintenance costs will accrue to people who are also utility customers. The electric industry and its regulators have a long history of advancing energy efficiency programs and bill-assistance programs to help utility customers who spend a disproportionate share of their income on electric bills, but the average

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[1] Application for Approval of Proposed Electric Transportation Pilot, Docket Nos. E-2 Sub 1197, E-7 Sub 1195 (Mar. 29, 2019) [hereinafter "Application"], Exhibit B (MJ Bradley & Associates, *Plug-in Electric Vehicle Cost-Benefit Analysis: North Carolina*), at ii-iii.

[2] National Research Council of the National Academy of Sciences, *Overcoming Barriers to the Deployment of Plug-in Electric Vehicles* at 105, the National Academies Press, 2015.

[3] Kinter-Meyer, Schneider, Pratt, *Impacts Assessment of Plug-in Hybrid Vehicles on Electric Utilities and Regional U.S. Power Grids* (November 2007).

[4] Energy and Environmental Economics (E3), *California Transportation Electrification Assessment Phase 2: Grid Impacts (*October 2014).

American household spends twice as much on gasoline annually as it does on electricity. Electrifying the transportation sector provides utility regulators an opportunity to offer households more comprehensive relief, cutting their transportation fuel bill at least in half (and potentially more if customers charge during off-peak hours on properly designed time-variant rates).

Likewise, the electrification of the transportation sector in North Carolina provides the Commission with an opportunity to support regional economic gains through reduced oil consumption and to leverage an increasingly clean grid to drive significant reductions in transportation sector emissions. Under the high EV-adoption scenario used by MJ Bradley, North Carolina can reduce gasoline consumption by 32.8 billion gallons through 2050.[5] Because North Carolina produces no oil[6], its oil imports are a large capital drain on the economy. In 2017, North Carolina imported 1.4 billion gallons of fuel oil and spent $10.961 billion on motor gasoline.[7] Against this backdrop, the local economic benefits that result from EV drivers' electricity fuel expenditures and associated cost savings[8] are of particular importance for North Carolinians.

Among the dozen entities that already have submitted letters of support in this proceeding, there is no disagreement: increased EV deployment supports health, security, electricity grid, economic, and environmental benefits. This consensus view is not surprising. The body of evidence concluding that EVs support these benefits is overwhelming. The

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[5] Application, Exhibit B at iii.

[6] U.S. Energy Information Administration, North Carolina State Profile (2018); https://www.eia.gov/state/print.php?sid=NC.

[7] U.S. Energy Information Administration, North Carolina Adjusted Sales of Distillate Fuel Oil by End Use (2019), https://www.eia.gov/dnav/pet/pet_cons_821dsta_dcu_SNC_a.htm; U.S. Energy Information Administration, Motor gasoline consumption, prices, and expenditures, State Energy Data Systems (2019), https://www.eia.gov/state/seds/seds-data-fuel.php?sid=US#Petroleum.

[8] E Korejwa, *The Returns to Vehicle Electrification: An Assessment of the Economic and Budgetary Impacts of Electric Vehicle Adoption in Oregon* (2015); J Todd et al, *Creating the Clean Energy Economy: Analysis of Electric Vehicle Industry* (2013); California Electric Transportation Coalition, *Plug in Electric Vehicle Development in California: An Economic Jobs Assessment* (2012); J Cortright, *New York City's Green Dividend* (2010).

Companies' ET Pilot is well designed to accelerate transportation electrification to realize the benefits described above sooner rather than later. In other words, the Companies have proposed investments today that could pull forward these future benefits.

II. The Electric Transportation Pilot should be approved with minor modifications.

The Companies' three-year ET Pilot consists of seven program elements: Residential EV Charging; Fleet EV Charging; EV School Bus Charging; EV Transit Bus Charging; Multi-Family Dwelling Charging; Public Level 2 Charging; and Direct Current Fast Charging.[9] Below, we review certain program elements and offer recommendations for improvements and the Companies' plan for data collection and reporting.

a. Data collection and reporting

The Companies propose to collect data regarding the ET Pilot and report it annually.[10] Given the Pilot's three-year duration, annual reporting does not provide sufficient opportunity for program improvement. To promote transparency and learning-by-doing, we recommend quarterly reporting with all reports and underlying data made publicly available. The Companies should clearly outline the proposed contents of their reports now to ensure that information needed to evaluate the success of each program will be collected.

Such reporting will be enhanced by the involvement of a diverse group of interested stakeholders. Accordingly, we recommend that the Commission establish a stakeholder advisory group to provide ongoing oversight of the ET Pilot. (In South Carolina, the Companies have proposed ongoing stakeholder engagement.[11]) Such a body could help the Commission and the

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[9] Application at 9.

[10] Application at 8.

[11] Amended Application for Approval of Proposed Electric Transportation Pilot and an Accounting Order to Defer Capital and Operating Expenses 17, *Application of Duke Energy Carolinas, LLC for Approval of Proposed Electric Transportation Pilot and An Accounting Order to Defer Capital and Operating Expenses*, Docket No. 2018-321-E

Companies to identify and correct potential problems by reviewing and providing input on quarterly reports. In addition, a number of Sierra Club's recommendations identify the need for further evaluation of certain issues—a stakeholder advisory group could assist with such evaluation.

b. Residential Electric Vehicle Charging Program

The Companies' Residential EV Charging Program would fund rebate and participation payments for the deployment of up to 800 smart charging stations at customer residences.[12] The purpose of this program component is to test the customer response to, and value of, managed EV charging.[13]

The Residential EV Charging Program component targets a core infrastructure need for EV drivers. In order to enable EV adoption, it is critical for would-be drivers to have access to infrastructure in "long-dwell time" locations where cars are most frequently located and available for charging. The typical car is parked at home 50 percent of the time.[14] Unsurprisingly, the National Research Council of the National Academies of Sciences characterizes home charging as a "virtual necessity" for all EV drivers, and that residences without access to electric vehicle charging "clearly [have] challenges to overcome to make PEV

(S.C. P.S.C. Apr. 1, 2019). As of July 2, 2019, the South Carolina Commission has yet to rule on Duke Energy's amended application.

[12] *Id.*

[13] *Id.*

[14] *See* Adam Langton and Noel Crisostomo, *Vehicle-Grid Integration*, California Public Utilities Department at 5 (October 2013); *see also* Marcus Alexander, *Transportation Statistics Analysis for Electric Transportation*, Electric Power Research Institute (December 2011).

ownership practical."[15] Drivers are very unlikely to purchase an EV if they cannot charge at home.[16] The rebates that the Companies propose to offer would help address this need.

The home is also the location where the vast majority of charging occurs.[17] In other words, the flexible, manageable load that EVs represent is most frequently available to provide grid services at the home. If home charging is managed to occur during off-peak periods, EV load can "fill valleys" in load without increasing overall capacity requirements. Similarly, EV load can be shifted to facilitate the integration of variable generation from renewable sources.[18] By increasing usage of standing assets, smoothing and shifting loads, and improving reliability, EV charging can lower the marginal cost of electricity for all customers.

The ET Pilot would test one method for vehicle-grid integration: direct load control by leveraging the "smarts" in EVs and EV charging equipment.[19] Sierra Club supports development of managed charging for vehicle-grid integration. We recommend that the Companies collect data on the accuracy of program participants' meters and make such data publicly available in their program reporting. Such data collection should enable an evaluation of the efficacy of the equipment as support for a separately-metered, EV-specific time-of-use rate. Time-of-use rates are a very effective[20] form of foundational load management. With the smart charging stations

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[15] National Research Council of the National Academies of Sciences, *Overcoming Barriers to the Deployment of Plug-in Electric Vehicles*, the National Academies Press at 9 (2015).

[16] *See* Adam Langton and Noel Crisotomo, *Vehicle-Grid Integration*, California Public Utilities Commission at 5 (October 2013).

[17] U.S. Department of Energy Office of Energy Efficiency and Renewable Energy, *National Plug-In Electric Vehicle Infrastructure Analysis* (September 2017) (identifying a range of home charging percentages for its scenario analysis and finding 82% to 88% as consistent with early market findings by The EV Project as reported by Idaho National Laboratory).

[18] *Id.*

[19] Application at 9-10.

[20] See, for example, The Department of Energy's EV Project, which has tracked the charging behavior of thousands of EVs since 2011, has shown that in areas with time-of-use ("TOU") rates and effective utility education and outreach, the majority of EV charging occurs during off-peak hours. This was not the case in areas without TOU rates, where EV demand generally peaked in the early evening, exacerbating early-evening system-wide peak

that would be deployed under the Residential component, the Companies have an opportunity to test the metrology that is embedded in those charging stations so as to avoid requiring a participating customer to put all of their electricity use on a time-of-use rate, or to install a second meter, which can be cost prohibitive. Sierra Club recommends that the Companies incorporate this additional element for the ET Pilot in order to more fully evaluate the options for vehicle-grid integration as well as develop an appropriate, EV-specific time-of-use rate. In addition, the Companies should collect and report data regarding managed charging response events and customer participation.

c. Fleet Electric Vehicle Charging Program

Under the Fleet EV Charging Program, the Companies would offer up to 900 rebates for charging infrastructure that serves public and private EV fleets. The Application references "a variety of EV types and weight-classes"[21] as well as "plug-in hybrids and battery electric vehicles,"[22] but does not specify what vehicle types would be supported by the program. The Companies should clarify the range of vehicle types for which charging equipment could be eligible for a program rebate. In addition to typical fleet EVs—light-duty vehicles and passenger cars—North Carolina commercial and industrial customers may be interested in electrifying forklifts, cargo handling equipment, and other motorized equipment. As an additional point of clarification, the Companies should make plain whether there is any limit on the number of rebates available to a single entity (other than the 500 limit in DEC and 400 limit in DEP).

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demand. *See* Schey, et al., *A First Look at the Impact of Electric Vehicle Charging on the Electric Grid, The EV Project at EVS26* (May 2012).

[21] Application at 10.

[22] Application, Ex. D.

d. Transit Bus Charging Program

For the Transit Bus Charging Program component, the Companies propose to fund the deployment of up to 105 transit bus stations.[23] Sierra Club strongly supports this program element. Among the many demonstrated, market-ready technologies in the medium- and heavy-duty sectors, there is no question that electric buses are ready for prime time. In 2015, the California Air Resources Board concluded that "zero emission transit buses are primed to be one of the first heavy-duty vehicle types to achieve significant zero-emission vehicle sales volumes, leading and supporting technology development in the heavy-duty sector as a whole." [24] Most bus manufacturers offer zero emission buses, [25] and multiple fleets already operate zero emission buses in regular revenue service.[26]

To be sure, there is a cost premium to purchase an electric bus over a conventional diesel bus, but the total cost of ownership for an electric transit bus can be lower than for a diesel or CNG bus even with that cost premium, due to maintenance and fuel cost savings. Put another way, the proposed Transit Bus Charging Program could help meet the higher up-front capital requirements of electric bus charging infrastructure, allowing a transit agency to then lock in the lower lifetime costs of electric buses. Lifetime savings can be re-invested into additional purchases of electric buses, creating a positive economic cycle, where a transit agency can continue to electrify its bus fleet, and further drive down operational costs as electric buses replace the entire fleet.

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[23] Application at 13.

[24] California Air Resources Board, *Advanced Clean Transit Regulation: Discussion Document* (May 2015).

[25] California Air Resources Board, *Innovative Clean Transit Regulation: Discussion Document* (December 2017).

[26] *Id.*

The Companies note their belief that "there are significant potential operational cost savings" for electric buses used in their service territories.[27] Operational costs typically fall into two categories: maintenance and fuel. Maintenance costs for electric vehicles are substantially less than conventional vehicles.[28] And the fuel cost savings from electricity fuel versus diesel are also substantial in theory, but can be frustrated by utility demand charges that do not accurately reflect the costs associated with transportation electrification use cases[29] and frustrate or erase the fuel cost savings upon which the economics of transportation electrification depend.[30]

To ensure that this program is successful, we recommend that the Companies provide an inventory of commercial and industrial rates that may be applicable to the charging of transit or other medium- and heavy-duty vehicles, and to work with the stakeholder advisory group to reform or replace those rates where necessary. In making this recommendation, we are not recommending that transportation electrification loads be subsidized, but that rate design should be optimized to account for the intended use cases. Because demand charges often do a poor job of reflecting actual distribution system costs, and because energy costs are better reflected in time-varying volumetric rates, reforming demand charges in general is good policy.[31]

As an example, the Commission and the Companies should look to recent efforts to optimize rates for transportation electrification use cases, including the suite of recently

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[27] Application at 12-13.

[28] *See, e.g.*, U.S. Federal Transit Administration, *King County Metro Battery Electric Bus Demonstration--Preliminary Project Results* (May 2017) (finding that the monthly per-mile maintenance costs of electric buses averaged $0.18/mi while diesel and hybrid buses averaged $0.32/mi and $0.44/mi, respectively).

[29] Examples of "use cases" might include (1) at-home charging of passenger EVs; (2) public charging at Level 2 or Direct Current Fast Charging stations; (3) charging of medium- and heavy-duty fleets that are publicly or privately owned, among others.

[30] *See, e.g.*, ICF, California Transportation Electrification Assessment – Phase 3-Part A: Commerical and Non-Road Grid Impacts – Final Report," at 47 (Jan. 2016) (finding that "[u]tility rate structures are one of several key decision factors for potential [transportation electrification] consumers, and can represent the difference between a consumer accruing a return on their investment or realizing a net loss.").

[31] *See Borenstein, Severin, The Economics of Fixed Cost Recovery by Utilities*, Energy Institute at Haas Working Paper 272R (July 2016).

approved Southern California Edison (SCE) rates that were refined in a stipulation between SCE, NRDC, Sierra Club, the Environmental Defense Fund, Siemens, the Coalition of California Utility Employees, and the Office of Ratepayer Advocates (which is housed in the California Public Utilities Commission).[32] Those rates are not subsidized, but have no demand charge component for the next five years, at which point demand charges will be phased in as utilization increases. Likewise, the Commission should examine a suite of rates that Pacific Gas & Electric recently proposed that incorporate a time-based energy charge and subscription fee, and do not include demand charges.[33]

e. School Bus Charging Program

With the School Bus Charging Program, the Companies would facilitate the replacement of old diesel school bus with clean electric models by funding the purchase of up to 85 buses and associated charging infrastructure.[34] Like electric transit buses, electric school buses are also market-ready and share in the same lifetime operation cost savings as transit buses.

Moreover, electrifying school buses can help a particularly vulnerable population—children. Regrettably, children are often the most exposed and most vulnerable to diesel emissions from school buses. Over 25 million children ride school buses each day nationwide, more than transit and passenger rail combined.[35] Children are exposed to diesel fumes while riding and getting on and off diesel school buses. Asthma, which diesel pollution exacerbates, is now the most common chronic condition among U.S. children, affecting 1 in 10 in the United

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[32] *See* Decision on the Transportation Electrification Standard Review Projects (D.18-05-040) at 110-17, A.17-01-020 *et al.*, California Public Utilities Commission (issued June 6, 2018).

[33] Application for Approval of Pacific Gas and Electric Company's (U 39 E) Commercial Electric Vehicle Rate, Application No. A.18-11-003, California Public Utilities Commission (filed November 5, 2018).

[34] Application at 11.

[35] National School Transportation Association, *The Yellow School Bus Industry* (2013).

States.[36] A University of Michigan and University of Washington public health study found that cleaner school transportation for children provides significant health benefits and could prevent 14 million school absences each year.[37] The School Bus Charging Program would help to overcome the upfront cost premium that stands between North Carolina school children and clean transportation to and from their classrooms.

In addition to significant health benefits, school buses are well-suited to facilitate the integration of renewables and support the electric grid due to their predictable duty-cycles. Sierra Club therefore strongly supports the proposal to purchase buses with bi-directional power flow capabilities. To ensure that, like the Transit Bus Charging Program, the School Bus Charging Program is not a one-off pilot and instead supports broader electric school bus adoption in North Carolina, Sierra Club recommends that the Companies provide an inventory of applicable rates and work with stakeholders to reform or replace rates if necessary. To ensure that the use of the bi-directional power flow capabilities are maximized, we recommend that the Companies share relevant data collected with stakeholders for evaluation as part of the stakeholder process. In addition, we recommend that, for the school bus program, the Companies collect and report similar data as they collect for the transit bus program.

f. Multi-Family Dwelling Charging Program

The Companies proposed Multi-Family Dwelling Charging Program would deploy 160 charging stations for use by multi-family dwelling residents. This program recognizes that drivers are unlikely to purchase plug-in vehicles if they cannot plug them in at home, where cars are typically parked for at least half the day,[38] and that less than half of U.S. vehicles have

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[36] Respiratory Health Association, *Asthma in Chicago Disparities: Perspectives and Interventions* (2011) at 1.

[37] SD Adar *et al.*, *Adopting Clean Fuels and Technologies on School Buses. Pollution and Health Impacts in Children* (June 2015).

[38] *See* Adam Langton and Noel Crisostomo, *Vehicle-Grid Integration*, California Public Utilities Department at 5

reliable access to dedicated off-street parking at an owned residence where charging infrastructure could be installed.[39] To date, almost ninety percent of EV drivers live in single-family detached homes.[40] As the National Academy of Sciences notes: "Lack of access to charging infrastructure at home will constitute a significant barrier to EV deployment for households without a dedicated parking spot or for whom the parking location is far from access to electricity."[41] Even if an EV driver can persuade an apartment owner or manager to engage in considerable learning and agree to install a charging station, considerable challenges remain: parking lots are often common or shared spaces, complicating authorization to install charging stations and billing arrangements; the costs of installing infrastructure at a distance from the building is more expensive; and, in the case of renters, investments in charging infrastructure may not be recoverable within their expected tenancy. The Multi-Family Dwelling Charging Station program would help to overcome the barriers to EV ownership by renters.

As with EV charging at single-family homes, EV drivers living in multi-family housing are likely to exhibit "home charging behavior" and, thus, should be encouraged to charge their vehicles during off-peak time (i.e., overnight), either with an EV-specific time-of-use rate or otherwise. The Companies should evaluate options for incentivizing off-peak charging.

(October 2013); *see also* Marcus Alexander, *Transportation Statistics Analysis for Electric Transportation*, Electric Power Research Institute (December 2011).

[39] Traut *et al.*, *US Residential Charging Potential for EVs (Transportation Research Part D)* (November 2013).

[40] Center for Sustainable Energy, *California Plug-in EV Owner Survey Dashboard*, *available at* https://cleanvehiclerebate.org/eng/survey-dashboard/ev.

[41] National Research Council of the National Academy of Sciences, *Overcoming Barriers to the Deployment of Plug-in Electric Vehicles* at 105, the National Academies Press, 2015.

g. Direct Current Fast Charging Station Program

The Direct Current Fast Charging ("DCFC") Station Program, in many ways, is the most important element of the Pilot. Only by making fast charging readily available for drivers can EVs have any chance at market penetration. Investment in such charging infrastructure is critical for advancing a clean energy future for North Carolinians. The Companies propose to own and operate up to 120 fast chargers at 60 DCFC stations in order to establish a foundational level of charging infrastructure along highway corridors in the state.[42] Like home charging, access to DCFC stations for distance travel strongly influences EV adoption decisions and is an important part of a comprehensive charging network. Without access to DC fast charging, vehicle range can be a limiting factor, and inter-city or distance travel is often impossible or impractical for all-electric vehicle drivers.[43] In addition to inhibiting distance travel and exacerbating anxieties about vehicle range, consumer research indicates that a "lack of robust DC fast charging infrastructure is seriously inhibiting the value, utility, and sales potential" of typical pure-battery electric vehicles.[44]

As with many network industries, the development of DC fast charging networks suffers from a "chicken-or-egg" market coordination problem. Prospective EV owners are reluctant to purchase an electric car in the face of limited access to charging infrastructure, while prospective hosts and backers of EV charging infrastructure cannot see a business case for EV charging station investment where too few EVs are in use. The market coordination problem is acute for DC fast charging stations, which have "high upfront costs" and "require significant revenues for

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[42] Application at 15.

[43] Nick Nigro *et al.*, *Strategic Planning to Implement Publicly Available EV Charging Stations: A Guide for Businesses and Policymakers* (2015) at 11.

[44] PlugShare, New Survey Data: BEV Drivers and the Desire for DC Fast Charging (March 2014).

the owner-operator to achieve profitability."[45] However, quantitative research on this problem in the EV context not only indicates that the increased supply of more EVs would drive the deployment of more public charging and vice-versa, but that a financial subsidy given to infrastructure investment will increase EV sales by more than twice the amount of the increase if the financial incentive is provided for EV purchase.[46] The Companies' proposed DCFC Station Program would help overcome the market coordination issues, and drive vehicle adoption.[47] For those reasons, we therefore support this necessary piece of the ET Pilot.

When drivers pull up and plug-in to ET Pilot DCFC stations, the Companies propose that they will pay a fee consistent with the statewide average for 24-hour-accessible, public stations.[48] We recommend that the Companies report the prices charged to EV drivers at DCFC stations.

h. Public Level 2 Charging Station Program

In addition to the fast charging stations, the Pilot includes another public charging program under which 200 Level 2 charging stations would be deployed at key public destination locations. The Application does not specify how such locations would be identified. We recommend that the Companies evaluate co-locating some stations with their DC fast charging stations. Doing so could create community charging hubs in more densely populated areas that support the charging of ride-share EVs, car-share EVs, and EVs owned or leased by individuals without access to home charging.

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[45] Nick Nigro *et al.*, *Strategic Planning to Implement Publicly Available EV Charging Stations: A Guide for Businesses and Policymakers* (2015) at 11.

[46] Li S *et al.*, *The Market for Electric Vehicles: Indirect Networks Effects and Policy Design*, Journal of the Association of Environmental and Resource Economists 4, no. 1 (March 2017).

[47] *Id.* (finding that "the increased availability of public charging stations has a statistically and economically significant impact on EV adoption decisions.").

[48] Application at 16.

III. Additional Considerations

In addition to the ET Pilot recommendations discussed above, we offer two recommendations for additional action to support EV market growth.

a. Non-utility electric vehicle charging station owners and operators should be allowed to provide charging services with per-kilowatt-hour pricing.

To better enable the EV charging market, any tariff restrictions that would prohibit non-utility owners or operators of EV charging ("site hosts") in North Carolina from pricing EV charging services on a kilowatt-hour basis reflecting actual energy consumption should be removed. Recognizing the benefits of allowing non-utilities to provide EV charging services, North Carolina lawmakers have introduced proposed legislation that would exempt such service providers from regulation as public utilities.[49]

Such legislation and the removal of tariff restrictions promote several basic policy objectives. First, volumetric, per-kilowatt-hour pricing supports price transparency for EV drivers. The kilowatt-hour is the common and familiar metric for measuring electricity consumption. Second, because kilowatt-hour pricing reflects actual energy consumed by an EV and not, for example, the time spent plugged in, it supports pricing that more accurately reflects EV driver's fuel costs. Take, for example, two electric cars that support common but different rates of charge: Car 1 has a charging capability of 3.3 kW, while Car 2 is rated for 6.6 kW. Assuming all else is equal, Car 1 will take twice as long to charge up as Car 2. Under a time-based pricing scheme (e.g., per minute)—the sort of scheme that is forced where per kilo-watt hour pricing is prohibited—driver of Car 1 will pay twice as much as the driver of Car 2 even though they have consumed an equal amount of electricity.

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[49] H.B. 329, Renewable Energy Amends., 2019 Reg. Sess. (N.C. 2019), *available at* https://www.ncleg.gov/Sessions/2019/Bills/House/PDF/H329v3.pdf.

Finally, per kilowatt-hour pricing allow site hosts to set prices for EV charging that reflect underlying grid conditions and encourage EV drivers to plug in at the right times, like TOU rates. In turn, this better enables site hosts to recover their own electricity costs. If site hosts are unable to pass time-varying price signals on to EV drivers—the people that need to "see" price signals if they are to respond to them—then grid integration of charging load and the benefits it can provide for all utility customers will be undermined.

b. In future filings, the Companies should take additional action to improve access to clean transportation options for all customers.

The Companies have indicated that, "if the Pilot is successful, the Companies may seek to grow the Pilot or seek early termination of the Pilot in favor of a full-scale offering to be filed with the Commission for approval."[50] We recommend that any future filing, whether a full-scale filing or a separate pilot, includes additional solutions directed at improving access to clean transportation options for low and moderate-income communities. In addition to promoting equity goals by ensuring that the economic benefits of transportation electrification accrue to communities at an economic disadvantage, accelerating transportation electrification will also help alleviate air pollution from fossil-fuel burning vehicles in those communities disproportionately overburdened by such pollution.[51] Examples of program elements that the Companies could implement or support include the following:

- Dedicating that a specific percentage of incentives delivered or infrastructure installed for light-duty vehicle charging occur in specific communities, and that incentive levels are higher in those communities[52];

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[50] Application at 18.

[51] Identifying those communities carrying the greatest pollution burden is not difficult—one place to start is to look at EPA's database of air quality monitors to see where monitors are reporting unsafe air pollution levels in recent years. In North Carolina, these include parts of Mecklenburg, Forsyth, Union, Catawba, and Guilford counties, for example.

- Designate that transit or school bus electrification efforts will primarily serve and/or travel through certain low-to-moderate income communities and communities disproportionately burdened by air pollution[53];

- Ride-share programs like BlueLA and BlueIndy—programs in Los Angeles and Indianapolis, respectively—that offer 24/7 access to a network of affordable shared electric vehicles placed strategically in low-income neighborhoods;

- Supporting infrastructure and vehicle cost-share for the electrification of trucks, buses, ground support equipment and port equipment that cause disproportionate impact to certain communities through local diesel pollution; and

- Site DCFC and Public Level 2 charging stations together at community charging hubs.

IV. Conclusion

For the reasons discussed above, Sierra Club respectfully requests that the Commission approve the ET Pilot program with the modifications described herein.

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[52] *See, e.g.*, Decision 16-12-065, Docket A.15-02-009, California Public Utilities Commission (filed Dec. 21, 2017) (approving $130M electric vehicle infrastructure investment, including: (1) a requirement that 15% of stations be located in disadvantaged communities as defined by California law and including a stretch goal of 20% deployment in disadvantaged communities; and (2) providing 100% rebates for stations located in disadvantaged communities, as opposed to partial rebates for stations deployed outside of that segment); Case 17-05, Department of Public Utilities (filed Nov. 30, 2017) (approving $45M electric vehicle infrastructure investment, including a 10% requirement for deployment of stations in disadvantaged communities).

[53] *See, e.g.*, Decision 16-12-065, Docket A.17-01-020, California Public Utilities Commission (filed May 31, 2018) ($300M of approved investment toward electrification of vehicles in or adjacent to disadvantaged communities).

Respectfully submitted this 5th day of July, 2019.

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CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing *Initial Comments of Sierra Club* upon each of the parties of record in these proceedings or their attorneys of record by deposit in the U.S. Mail, postage prepaid, or by email transmission.

This the 5th day of July, 2019.

/s/ Matthew D. Quinn
Matthew D. Quinn