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November 14, 2022

Ms. A. Shonta Dunston
Chief Clerk
North Carolina Utilities Commission
430 N. Salisbury Street, Room 5063
Raleigh, NC 27603

Via Electronic Submittal

Re: In the Matter of Application by Duke Energy Carolinas, LLC for Approval of Electric Vehicle-to-Grid Pilot Program Pursuant to N.C. Gen. Stat. § 62-133.9 and Commission Rule R8-68; NCUC Docket No. E-7, Sub 1275; *Vote Solar Comments*

Dear Ms. Dunston:

On behalf of Vote Solar, I am herewith submitting the attached Comments in the above referenced matter and docket.

If you should have any questions concerning this filing, please let me know.

Thank you and your staff for your assistance.

Sincerely,
/s/ David T. Drooz
David T. Drooz
Attorney for Vote Solar

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Enclosure

cc: All parties and counsel of record
NC Public Staff

STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET No. E-7, SUB 1275

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of Application by Duke Energy Carolinas, LLC For Approval of Electric Vehicle-to-Grid Pilot Program Pursuant to N.C. Gen. Stat. § 62 -133.9 and Commission Rule R8-68	**VOTE SOLAR COMMENTS**

On September 16, 2022, the North Carolina Utilities Commission ("Commission") issued an order allowing interested parties until November 14, 2022, to petition for intervention and file comments in the instant docket. Pursuant to that order and the Commission's rules, Vote Solar hereby submits the following comments, as well as a petition to intervene that is being filed contemporaneously.

1. Vote Solar supports the deployment of electric vehicles ("EVs") and associated programs and rate design that promote EV deployment, which in turn supports a timely, cost-effective transition to help meet the carbon targets set forth in HB 951. In addition, Vote Solar has entered a Memorandum of Understanding ("MOU") with Duke Energy Carolinas, LLC ("DEC"), and Duke Energy Progress, LLC ("DEP"), to collaboratively develop Distributed Energy Resource ("DER") pilots, signed February 9, 2022. In accord with its policy goals and its MOU with

DEC and DEP, Vote Solar supports the DEC proposal for a vehicle-to-grid ("V2G") pilot program ("V2G Pilot"), subject to the following comments.

2. The V2G Pilot deserves Commission approval because it projects cost-effective demand-side management. Attachment B to the DEC application estimates the dollar benefits will exceed the program costs by ratios of 1.24 (Utility Cost Test), 2.56 (Total Resource Cost test), and 1.24 (Ratepayer Impact Measure test). These are the standard tests used to assess cost-effectiveness of demand response measures for regulatory purposes. The DEC estimates are solid support for proceeding with the V2G Pilot so that additional data can be obtained on cost effectiveness and the estimates can be refined.

3. The V2G Pilot further deserves Commission approval because it provides twin policy benefits. First, demand-side management response is a beneficial substitute to building new generation, as reflected in statutes and rules such as N.C.G.S. §§ 62-133.8 and -133.9, and Rule R8-68. This benefit is not just a function of cost-effectiveness; it also reduces emissions by offsetting combustion generation. Second, the V2G Pilot will incentivize use of EVs, which is another way to substitute clean energy for combustion energy, albeit with vehicles instead of generating plants.

4. Vote Solar recommends two supplemental elements to the DEC proposal to enable evaluation of the V2G Pilot performance at the feeder level as a hosting capacity constraint mitigation tool.

a. DEC should report on V2G pilot participation kW reduction performance at the feeder and substation level, using anonymized customer data.

b. DEC should use one test event in summer and one test event in winter to test the ability for V2G discharging to mitigate distribution constraints. If any participants are on a feeder experiencing reverse power flow issues or other capacity constraints, these participants should be used. If no participants are on a constrained feeder, DEC should perform modeling to analyze how the actual participant V2G performance would have affected a feeder with reverse power flow and other capacity constraints.

The reason for these two recommendations is that DEC states that "...the purpose of this Pilot is to learn more about managing peak load conditions...[1]" As proposed, the Pilot is structured to provide valuable learnings about the potential for EVs to meet system peak demands. However, feeder and substation level peak demands also impose costs to ratepayers and can be managed with the activities contained in this Pilot. Considering the expected load growth in North Carolina due to economic development, electrification, or other means, this Pilot should include specific provisions to establish lessons learned on how V2G services can mitigate distribution constraints.

[1] Application, p. 2.

Vehicle-to-grid management can provide value to utilities and ratepayers by mitigating, minimizing, or deferring feeder level grid constraints. A 2019 study by the Electric Power Research Institute[2] modeled the interactions between V2G services and a constrained distribution feeder and found that V2G can not only provide savings to ratepayers but serve as a tool to mitigate hosting capacity constraints. A recent study[3] uses hosting capacity data available to stakeholders in California to analyze the impact that building and vehicle electrification will have on the demand for distribution upgrades. The authors found that electrification may require between $1-$10 billion dollars to the rate base for distribution infrastructure alone. A key factor of how large the rate base increase will be is how well loads are managed and if non-wires alternatives are deployed effectively. The V2G Pilot can serve as a critical learning experience to keep distribution infrastructure upgrades to a minimum.

Concurrently, both DEC and Duke Energy Progress (DEP) are developing a Grid Hosting Capacity (GHC) analysis pursuant to settlement agreements signed July 23, 2020, in Docket Nos. E-2, Sub 1219[4] and E-7, Sub 1214[5]. A good hosting

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[2] Electric Power Research Institute. (July 28, 2019). Open Standards-Based Vehicle-to-Grid: Value Assessment. Retrieved from: https://www.epri.com/research/products/000000003002014771

[3] Elmallah, S., Brockway, A., & Duncan, C. (June 2022). Can Distribution Grid Infrastructure Accommodate Residential Electrification and Electric Vehicle Adoption in Northern California? *Energy Institute at Haas*. Retrieved from: https://haas.berkeley.edu/wp-content/uploads/WP327.pdf

[4] Docket No. E-2 Sun 1219. Duke Energy Progress, LLC, Agreement and Stipulation of Settlement with Stipulating Parties. July 23, 2020. https://starw1.ncuc.gov/NCUC/ViewFile.aspx?Id=2d59661b-3d53-43d0-965f-82eb2db1c0d0

[5] Docket No. E-7 Sun 1214. Duke Energy Carolinas, LLC, Agreement and Stipulation of Settlement with Stipulating Parties. July 23, 2020. https://starw1.ncuc.gov/NCUC/ViewFile.aspx?Id=8beee01d-5e38-4032-9c6e-482fcfdccba0

capacity analysis[6] should enable utilities, regulators, and other stakeholders to proactively plan distribution investments and programs to leverage all tools available, including V2G, to prevent distribution constraints in the most cost-effective manner that is aligned with HB 951 goals. While DEC territory has yet to see widespread distribution constraints, many jurisdictions that have higher penetrations of DERs and EVs are starting to see such constraints. While GHC data is not yet available to stakeholders in NC and discussions are ongoing about which data will be available to stakeholders upon completion, it would be possible for DEC and other stakeholders to perform analysis with GHC data similar to the California analysis cited in this section to identify and estimate the localized value of V2G services and other DER programs. In order to effectively prepare for the low carbon grid mandated by HB 951, DEC should ensure that all pilots and programs are designed to yield applicable learnings for managing a high DER, low carbon grid.

5. If the V2G Pilot justifies a full V2G demand-side program, DEC should offer program participation to all EVs – driver-owned as well as leased vehicles. Vote Solar commends the innovative approach DEC has taken to work directly with Ford Motor Company to reduce monthly lease payments by the program incentive. As the first V2G pilot applied for by DEC, this structure should streamline participation and lower program administration costs. This pilot may also serve as a model for other utilities to partner with Ford Motor Company in a

[6] Interstate Renewable Energy Council. (N.D.) Hosting Capacity Analysis. https://irecusa.org/our-work/hosting-capacity-analysis/

similar fashion, which would yield significant learnings about V2G, which could, in turn, benefit North Carolina ratepayers.

Considering that DEC "intends to propose a full-scale commercialized version of this pilot[7]," Vote Solar believes it is critical to ensure all operators of EVs have a pathway to participate in programs like this pilot. Participation by all owners would only increase the benefits. While a 2018 report by Bloomberg New Energy Finance[8] suggested that the majority of EV drivers were leasing their vehicle, trends in the EV space change rapidly. A recent report by Experian[9] using financial data through Q4 of 2021 found that, for consumers that use financing, 72.3% purchase the EV while 27.7% of financing goes towards a lease. Regardless of the trends in ownership and leasing, in order to effectively utilize EVs as a grid asset, all EV operators should eventually have a pathway to participate in a grid service program.

Vote Solar therefore recommends that any full-scale V2G program allow for driver-owned EVs to participate, or Duke should pursue separate programs for leased and owned EVs.

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[7] Application, p. 2.
[8] Bloomberg. (January 3, 2018). Electric Car Drivers Are Too Smart to Own Electric Cars. Retrieved from: https://www.bloomberg.com/news/articles/2018-01-03/why-most-electric-cars-are-leased-not-owned
[9] Experian. (February 24, 2022). The percentage of electric vehicle financing doubled year-over-year, according to a new Experian report. Retrieved from: https://www.experianplc.com/media/latest-news/2022/the-percentage-of-electric-vehicle-financing-doubled-year-over-year-according-to-a-new-experian-report/

CONCLUSION

The DEC proposal for a V2G Pilot should be approved, as it projects cost-effective demand-side management and would incrementally help reduce power plant emissions and vehicle emissions. Vote Solar recommends that approval include a requirement for DEC to report on V2G pilot participation kW reduction performance at the feeder and substation level, using anonymized customer data. Vote Solar recommends that approval include a requirement that DEC should test and model the ability for V2G discharging to mitigate distribution constraints as described above. Finally, Vote Solar recommends that adoption of a full scale V2G program be offered to all DEC customers who operate of EVs, not just to DEC customers who lease EVs.

Respectfully submitted, this the 14th day of November, 2022.

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CERTIFICATE OF SERVICE

I hereby certify that, on November 14, 2022, the foregoing document was served upon all parties and counsel of record, and on North Carolina Public Staff, by electronic mail, or depositing the same in the United States mail, postage prepaid.

FOX ROTHSCHILD LLP

/s/ David T. Drooz
David T. Drooz