

**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. § 52-	)	<b>COMMENTS OF</b>
133.9 and Commission Rule R8-68	)	<b>THE PUBLIC STAFF</b>

NOW COMES THE PUBLIC STAFF – North Carolina Utilities Commission (Public Staff), by and through its Executive Director, Christopher J. Ayers, pursuant to Commission Rule R8-68(d)(2) and the Commission’s July 29, 2022 Order Granting Extension of Time in which to file comments and requiring that comments be filed by November 14, 2022, and respectfully submits the following comments.

**BACKGROUND**

1. On August 16, 2022, Duke Energy Carolinas, LLC (DEC or the Company) filed an Application (Application) for Approval of Electric Vehicle-to-Grid Pilot Program (Pilot) and requested that the Commission: (1) approve the Pilot as a demand side management (DSM) pilot pursuant to N.C. Gen. Stat. § 62-133.9 and Commission Rule R8-68, effective November 1, 2023; (2) find that the Pilot meets the requirements of a “new” DSM Pilot consistent with N.C.G.S. §§ 62-133.8 and 62-133.9 and Commission Rules R8-67 and R8-68; and (3) find that the costs of the Pilot are eligible for recovery through DEC’s annual DSM/Energy Efficiency

(EE) rider. DEC did not specifically request approval of net lost revenues or Portfolio Performance Incentives (PPI) associated with the Pilot.

2. On September 13, 2022, the Public Staff filed a motion to extend the September 15, 2022 deadline for filing comments pursuant to Commission R8-68(d)(2) by 60 days.

3. On September 16, 2022, the Commission granted this motion and required that comments be filed by November 14, 2022.

### **PILOT DESCRIPTION**

4. DEC proposes in its Application to work with the Ford Motor Company (Ford) to pilot a program that will allow DEC to use certain electric vehicles' (EV) batteries as a dispatchable distributed energy resource (DER) to help manage peak load conditions. The Pilot, if approved, will provide DEC with opportunities to evaluate the bi-directional vehicle-to-grid (V2G) technology, the availability and performance of EV batteries, and how the load management activities impact the battery life and functionality. The Company further states that the Pilot will provide insight into customers' behaviors and willingness to allow DEC to control EV batteries.

5. The Application states that bi-directional charging technology is becoming increasingly common in the production of EVs. DEC has collaborated with Ford to develop opportunities for EV lessees and customers that could result

in lower costs for the utility and allow customers to recognize the full value of their EVs.

6. Pilot participants must be individually metered residential customers who have leased a qualifying EV and installed the necessary EV supply equipment at their residence. DEC states that, initially, the Ford F150 Lightning will serve as the only EV for the Pilot. However, the Company expects to expand the Pilot to include other models and manufacturers in the future. According to the Company, a large number of eligible EVs are being leased by customers and, historically, fewer than 10% of customers relocate during their applicable lease term. DEC indicates that these attributes provide a stable pool of participants during the Pilot term.

7. Participation in the Pilot involves participants allowing DEC to call upon the EV battery's capability for up to 24 control/discharge events per year. DEC proposes to call three events during each of the winter months (December through February) and each of the summer months (June through August); and one event in each of the remaining shoulder months.

8. Participants will be notified at least 18 hours in advance of events, and discharge events will last no longer than four hours. The Company's Rider EVM states that DEC reserves the right for interruption outside of these parameters in the event continuity of service is threatened; and, similarly, that DEC reserves the right to test the connectivity and discharge capability of the

participant's EV battery at any time, without notice, and that such test periods shall be counted toward the maximum number of events.

9. Participants will be allowed to opt-out of control events and the Company will monitor availability of the EVs. Participants who opt-out from part or the whole of a control event in a single winter or summer may be subject to removal from the Pilot and forfeit receipt of the incentives.

10. Participants may transfer service to a different location within DEC's service territory. However, participation in the Pilot shall also be transferred to the new service location upon re-installation of the EV supply equipment.

11. Participants who terminate participation within 12 months of their initial participation will be subject to a termination payment equal to the sum of all financial incentives that the participant has received.

12. Participants will also be required to install and maintain the EV supply equipment consistent with the Company's interconnection procedures.

13. An incentive of \$6.50 per kilowatt (kW) demand per month will be paid directly by the Company to Ford to reduce the customer's monthly EV lease payment. The amount of kW demand and the corresponding incentive amount will be based on the battery discharge capability. If the actual annual battery capability exceeds the assumed capability, participants will also receive a \$25 gift card.

### **Projected Participation**

14. DEC expects to enroll at least 35 participants and no more than 100 participants. Attachment A to the Application demonstrates that, in the first two years of the Pilot, DEC expects to enroll approximately 385 kW of dispatchable DER. Once the Pilot is fully commercialized, DEC expects approximately 7.8 MWs of dispatchable DER from participating EVs.

### **Projected Costs**

15. Attachment C of the Application lists the total projected costs over the first five years as follows:

	<b>Costs</b>
Implementation Costs	\$874,014
Administrative (EM&V) Costs	\$335,102
Participant Incentives	\$3,529,550 <sup>1</sup>
Other Utility Costs	\$703,603
Total Costs	\$5,442,270

### **Cost-Effectiveness**

16. According to Attachment B to the Application, DEC projects the total net present value of benefits of the Pilot to be \$17,483,851. Approximately 40% of

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<sup>1</sup> This number reflects the total cost of participant incentives as listed in lines 21-25 of Attachment C. Although Line 22 of Attachment C states "\$831" as the value for Year 2 incentives, the supporting workpapers demonstrate that the correct value for Line 22 is \$831,000, resulting in the total amount of participant incentives listed above.

the system-level avoided cost benefits are derived from capacity savings and 60% from transmission and distribution (T&D) savings.

17. The cost-effectiveness results from the Pilot and post-commercialization<sup>2</sup> are summarized below:

Utility Cost Test	1.24
Total Resource Cost Test	2.56
Ratepayer Impact Measure Test	1.24
Participant Test	Not applicable

#### **THE PUBLIC STAFF'S REVIEW**

18. The Public Staff's investigation included review of the Application with respect to N.C.G.S. § 62-133.9; Commission Rule R8-68; the Commission's *Order Approving Revisions to Demand-side Management and Energy Efficiency Cost Recovery Mechanism*, issued October 20, 2020, in Docket No. E-7, Sub 1032 (Cost Recovery Revision Order); and the cost recovery mechanism approved by the Commission in the Cost Recovery Revision Order (Mechanism). The Public Staff's investigation also involved submission of data requests to DEC regarding the Pilot, and review of the Company's responses.

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<sup>2</sup> Attachment B states that the "[d]ata represents present value of costs and benefits over the life of the program," which DEC has clarified includes the duration of the Pilot and the first three years of commercialization.

19. Concerning the fixed credit amount that will be used as an offset to the participant's lease payment, DEC did not provide any formal workpapers related to the per kW credit amount or the \$25 gift card incentive. The Public Staff learned in response to a data request that: (1) **[BEGIN CONFIDENTIAL]** [REDACTED]  
[REDACTED]  
[REDACTED] **[END CONFIDENTIAL]**; (2) the \$6.50 per kW amount is intended to provide a meaningful credit amount to motivate participation; and (3) the additional \$25 gift card was not specifically based on any assumed additional capacity savings, but rather as a general incentive to participants to have their vehicle available during events.

20. DEC indicated in a data request response that discharge/control events will be called during times of high system demand consistent with the use of existing DSM resources. Calling of events during times of high demand is also intended to provide DEC with insight about the batteries' availability and participant response.

21. Regarding cost-effectiveness, the Public Staff notes that, as is typical of pilot programs, the two-year Pilot itself is not expected to be cost-effective. If the Pilot can prove to attract participation and provide meaningful capacity reductions as anticipated by DEC, the five-year perspective of the Pilot and commercialization are expected to produce cost-effective capacity savings and serve as the basis for a longer-term DSM program.

22. The Public Staff has no issue with the calculations and data used to determine the costs or cost-effectiveness of the Pilot. Limiting the participation to less than 100 participants, establishing a budget, the conditions for participation, and the use of a third party to perform EM&V are appropriate limitations of scale and scope for pilot programs. Although DEC stated in its Application that the Ford Lightning is the only EV with bi-directional charging that the Pilot is initially utilizing, the Company acknowledged in discovery that, if DEC is not able to achieve sufficient participation through its arrangement with Ford, the Company will allow other EV manufacturers who produce EVs with bi-directional technology to participate under a similar lease arrangement method.

23. The Public Staff also learned through discovery that an EM&V evaluation plan has not yet been developed. While evaluating participants' willingness to allow DEC access to their EVs is an important component of the Pilot, the level of capacity reductions per EV that can be achieved, the impacts on the system when the dispatch/control event is concluded, how the leasing arrangement with EV manufacturers impacts participation, and how the telematics data of the battery and availability can inform long-term commercialization of the Pilot and other future DSM programs are all critical to developing EVs as a DER.

24. Given the strong interest and need to develop DERs in general and DSM resources specifically, it is critical that DEC develop its EM&V evaluation plan as soon as possible. The impacts of using EVs as a DER could prompt the EV market to develop quicker than expected. Marketing initiatives by EV



manufacturers and dealerships, as well as government policy directions and incentives, could create a vigorous market for EVs.

25. The Public Staff confirmed through discovery that DEC's avoided energy and capacity benefits were valued using the avoided cost rates derived from Docket No. E-100, Sub 167; and that the avoided T&D benefits were valued using the updated rates associated with DEC's 2022 DSM/EE rider filing (Docket No. E-7, Sub 1265), which were agreed upon between DEC and the Public Staff for use in the Vintage 2023 forecast.

26. The Public Staff highlighted the EV market potential in its Comments filed on July 15, 2022, in response to DEC's and Duke Energy Progress, LLC's (together, Duke) Proposed Carbon Plan in Docket No. E-100, Sub 179. In its Comments, the Public Staff noted the potential growth in EV-related loads and how that load could impact the system. Duke's Proposed Carbon Plan did not consider the management of EV loads in its load forecast. The Public Staff ultimately recommended that Duke continue studying EV loads, EV customer charging behaviors, market trends, and develop rates and programs that will encourage managed charging behaviors. While the Pilot is not specifically designed as a managed charging program, the Pilot should provide insight into customer charging behaviors and provide information that could better inform future rate- and managed-charging programs.

27. Paragraph 59 of DEC's Mechanism allows the recovery of net lost revenues if, at the time of an application, the Company intends to develop a pilot

into a full-scale approved program and subject the program to appropriate EM&V. Paragraph 59 also requires that a pilot program's cost-effectiveness be proven for it to receive net lost revenues upon true-up.

28. Paragraph 67 of the Mechanism allows the recovery of a PPI for a pilot if the Commission specifically approves a request at the time of an application, and if the pilot is ultimately commercialized as a full-scale program.

29. DEC indicated in discovery that the Company had not identified any potential for a commercialized version of the Pilot to produce net lost revenues. This is typical of DSM programs, which are intended to provide capacity or demand savings and not energy savings. DEC indicated that, if the Pilot were to be approved in the future as a fully commercialized DSM program, the Company will seek approval of a PPI for the program.

30. The Public Staff would appreciate the opportunity to work with DEC to develop a reporting template that will provide useful information on commercialization of the Pilot and the potential for other managed charging programs and DSM programs. The reporting template could include information such as:

- Participant availability, EV kW capacity received during an event, any observed rebound of load following the conclusion of an event, participant event opt-outs, information related to the battery and charger telematics, and any information related to the lease arrangement;

- Information related to how the EV battery capacity supports grid stability/reliability;
- Incentives paid;
- Levels of participation and the tenure of participants during the Pilot and the reasons why participants were removed from the Pilot; and
- Any other information that will inform future commercialization of the Pilot.

31. The Public Staff did not discover any information suggesting that the Pilot will affect a customer's decision to install natural gas or electric service.

### **CONCLUSIONS AND RECOMMENDATIONS**

32. The Public Staff is satisfied that the filing contains the information required by Commission Rule R8-68(c) and that it is consistent with N.C.G.S. § 62-133.9, Commission Rule R8-68(c), and the Mechanism.

33. The Public Staff concludes that the Pilot has the potential to encourage DSM, is consistent with DEC's most recently approved integrated resource plan, is in the public interest, and should be approved as a "new" DSM Pilot pursuant to Commission Rule R8-68.

34. The Public Staff further concludes that the Pilot should be eligible for consideration of recovery of Pilot costs.

35. The Public Staff recommends that the Commission determine the appropriate recovery of costs of the Pilot in annual DSM/EE rider proceedings consistent with N.C.G.S. § 62-133.9, Commission Rule R8-69, and the Mechanism. Any future request for net lost revenues or PPI related to a commercialized version of the Pilot should be addressed at the time DEC files for approval of the commercialized version of the Pilot.

36. The Public Staff recommends that DEC file an EM&V evaluation plan as soon as it becomes available but not later than 90 days following implementation of the Pilot.

37. The Public Staff recommends that the Commission require DEC and the Public Staff to jointly develop a reporting template and to file the template prior to implementation of the Pilot. Furthermore, the Public Staff recommends that DEC file such report on a quarterly basis.

38. Finally, the Public Staff recommends that the Commission approve the Pilot for a period of two years. The Public Staff recognizes the likelihood that the Pilot may need to be extended further. However, the decision to extend the Pilot should be addressed in the future when all parties will have a better understanding of customer participation and involvement. Accordingly, the Public Staff recommends that, three months prior to the expiration of the Pilot, DEC should file a request to extend or cancel the Pilot, or request to transition the Pilot into a fully commercialized program. When doing so, DEC should include the following updated information:

- Updated cost-benefit analysis, including updated calculations of each of the four standard cost-effectiveness tests;
- Any EM&V that is available to date;
- The actual costs incurred to date;
- A comparison of the initially estimated and actual costs, benefits, and participation for each year of the Pilot; and
- Any other relevant information that will support DEC's request for cancellation, continuation, or developing the Pilot into a full program.

Respectfully submitted, this the 14<sup>th</sup> day of November 2022.

PUBLIC STAFF

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## CERTIFICATE OF SERVICE

I certify that I have caused to be served a copy of the foregoing on all the parties of record on the date set forth below in the manner set forth below on the person(s) set forth below and in accordance with the applicable jurisprudence, especially Commission Rule R1-39.

This document contains the confidential information of the filing party. An unredacted copy of this document was served on November 14, 2022, only upon the person who signed the Application and said service was accomplished via email electronic delivery by agreement of the receiving party at the following address: [kendrick.fentress@duke-energy.com](mailto:kendrick.fentress@duke-energy.com).

A redacted copy was served on November 14, 2022, via email electronic delivery by agreement of the receiving party, upon those persons identified in either the filings or the Commission's online docket's service list as follows: [jack.jirak@duke-energy.com](mailto:jack.jirak@duke-energy.com).

Electronically submitted  
/s/ Anne M. Keyworth  
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