STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-2, SUB 1276

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of Application of Duke Energy Progress, LLC for Approval of Renewable Energy and Energy Efficiency Portfolio Standard (REPS) Compliance Report and Cost Recovery Rider Pursuant to N.C. Gen. Stat. 62-133.8 and Commission Rule R8-67	**DIRECT TESTIMONY OF MEGAN W. JENNINGS**

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Megan W. Jennings, and my business address is 400 South Tryon Street, Charlotte, North Carolina.

Q. PLEASE STATE YOUR POSITION WITH DUKE ENERGY AND DESCRIBE YOUR CURRENT RESPONSIBILITIES.

A. In my capacity as Renewable Compliance Manager, I am responsible for the development and implementation of renewable energy compliance strategies for Duke Energy Progress, LLC ("Duke Energy Progress," "DEP" or "the Company"), Duke Energy Carolinas, LLC ("Duke Energy Carolinas" or "DEC") and Duke Energy Ohio, LLC. My responsibilities include compliance with North Carolina's Renewable Energy and Energy Efficiency Portfolio Standard ("REPS"), compliance with Ohio's Renewable Portfolio Standard and evaluation of renewable generation initiatives and customer programs that relate to renewable compliance.

Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL BACKGROUND.

A. I received a Bachelor of Science in Mathematical Sciences from Clemson University and a Master of Financial Mathematics from North Carolina State University.

Q. PLEASE DESCRIBE YOUR BUSINESS BACKGROUND AND EXPERIENCE.

A. I joined Progress Energy, Inc. in 2008, where I held positions in Investor Relations and Regulatory Planning. Following the merger of Progress

Energy, Inc. with Duke Energy Corporation, I worked in the Rates and Regulatory Strategy Department until June of 2015, when I moved to my current position as Renewable Compliance Manager.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE NORTH CAROLINA UTILITIES COMMISSION ("COMMISSION")?

A. Yes, I most recently provided testimony in Docket No. E-7, Sub 1246 on DEC's 2020 REPS compliance report and application for approval of its REPS cost recovery rider.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to describe Duke Energy Progress' activities and the costs it has incurred, or will incur, in support of compliance with North Carolina's REPS under N.C. Gen. Stat. ("G.S.") § 62-133.8 during the twelve months beginning on April 1, 2020 and ending on March 31, 2021 ("Test Period"), as well as during the twelve months beginning on December 1, 2021 and ending on November 30, 2022 ("Billing Period").

Q. PLEASE DESCRIBE THE EXHIBITS TO YOUR TESTIMONY.

A. My testimony includes nineteen exhibits: Jennings Confidential Exhibit No. 1 is the Company's 2020 REPS Compliance Report, and Jennings Confidential Exhibit No. 2 provides actual and forecasted REPS compliance costs, by resource, that the Company has incurred during the Test Period and projects to incur during the Billing Period in support of compliance with REPS. Jennings Confidential Exhibit No. 3 is a worksheet detailing the

other incremental costs included in this filing, listing separately labor and non-labor costs, as directed by the Commission in its January 17, 2017 *Order Approving REPS and REPS EMF Rider and REPS Compliance Report* in Docket No. E-2, Sub 1109. Jennings Exhibit Nos. 4-19 are the results of studies the costs of which the Company is recovering via the REPS Rider.

Q. WERE THESE EXHIBITS PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER YOUR SUPERVISION?

A. Jennings Confidential Exhibit Nos. 1-3 were prepared by me or under my supervision. Jennings Exhibit Nos. 4-19 include the results of studies not prepared under my supervision. However, in my role at Duke Energy, I am familiar with the studies.

Compliance with REPS Requirements

Q. WHAT ARE DUKE ENERGY PROGRESS' REPS REQUIREMENTS UNDER G.S. § 62-133.8?

A. Pursuant to G.S. § 62-133.8,[1] as an electric power supplier, Duke Energy Progress is required to comply with the overall REPS requirement ("Total Requirement") by submitting for retirement a total volume of renewable energy certificates ("RECs") equivalent to the following percentages of its North Carolina retail sales in the prior year:

- Beginning in 2012, three percent (3%);

[1] In its *Order Clarifying Electric Power Suppliers' Annual REPS Requirements*, Docket No. E-100, Sub 113 (November 26, 2008), the Commission clarified that the calculation of these requirements for each year shall be based upon the electric utility's North Carolina retail sales for the prior year.

- In 2015, six percent (6%);
- In 2018, ten percent (10%); and
- In 2021 and thereafter, twelve-point five percent (12.5%).

Furthermore, each electric power supplier must comply with the requirements of G.S. §§ 62-133.8 (d), (e), and (f) (individually referred to as the "Solar Set-Aside," "Swine Waste Set-Aside," and "Poultry Waste Set-Aside," respectively). That is, within the Total Requirement described above, each electric power supplier is to ensure that specific quantities of qualifying solar RECs, swine waste RECs, and poultry waste RECs are also submitted for retirement. The Company generally refers to its Total Requirement net of the three set-asides as its "General Requirement."

Specifically, each electric power supplier is to comply with the Solar Set-Aside by submitting for retirement a volume of qualifying solar RECs equivalent to the following percentages of its North Carolina retail sales in the prior year:

- Beginning in 2010, two-hundredths of one percent (0.02%);
- In 2012, seven-hundredths of one percent (0.07%);
- In 2015, fourteen-hundredths of one percent (0.14%); and
- In 2018 and thereafter, two-tenths of one percent (0.2%).

Each electric power supplier is also to comply with the Swine Waste Set-Aside by submitting for retirement a volume of qualifying swine waste RECs equivalent to its pro-rata share of total retail electric power sold in North Carolina multiplied by the statewide, aggregate swine waste set-aside

requirement.[2] Duke Energy Progress' Swine Waste Set-Aside requirements, as modified by the Commission,[3] are as follows:

- In 2018, its pro-rata share of two-hundredths of one percent (0.02%) of the total retail electric power sold in North Carolina in the year prior;
- In 2019, its pro-rata share of four-hundredths of one percent (0.04%) of the total retail electric power sold in North Carolina in the year prior;
- In 2020, its pro-rata share of seven-hundredths of one percent (0.07%) of the total retail electric power sold in North Carolina in the year prior;
- In 2022, its pro-rata share of fourteen-hundredths of one percent (0.14%) of total retail electric power sold in North Carolina in the year prior; and
- In 2025 and thereafter, its pro-rata share of two-tenths of one percent (0.2%) of total retail electric power sold in North Carolina in the year prior.

[2] In its *Order on Pro Rata Allocation of Aggregate Swine and Poultry Waste Set-Aside Requirements and Motion for Clarification* in Docket No. E-100, Sub 113 (March 31, 2010), the Commission approved the electric power suppliers' proposed pro-rata allocation of the statewide aggregate swine and poultry waste set-aside requirements, such that the aggregate requirements will be allocated among the electric power suppliers based on the ratio of each electric power supplier's prior year retail sales to the total statewide retail sales.

[3] In its *Order Modifying the Swine and Poultry Waste Set-Aside Requirements And Providing Other Relief* (December 16, 2019) and its *Errata Order* (February 13, 2020), Docket No. E-100, Sub 113, the Commission not only modified the 2019 Swine Waste Set-Aside requirement for electric public utilities but also delayed by one year the scheduled increases to the requirement to 0.07% in 2020. Similarly, the Commission also modified the 2019 Poultry Waste Set-Aside requirement and delayed by one year the scheduled increases in the requirement to 700,000 MWh in 2020.

Finally, each electric power supplier is also to submit for retirement a volume of qualifying poultry waste RECs equivalent to its pro-rata share of the aggregate state-wide poultry waste set-aside requirement. Duke Energy Progress' Poultry Waste Set-Aside requirements, as modified by the Commission, are as follows:

- Beginning in 2014, its pro-rata share of 170,000 megawatt-hours ("MWh");
- In 2018, its pro-rata share of 300,000 MWh;
- In 2019, its pro-rata share of 500,000 MWh;
- In 2020, its pro-rata share of 700,000 MWh; and
- In 2021 and thereafter, its pro-rata share of 900,000 MWh.

The requirements that are described in this testimony and accompanying exhibits reflect the aggregation of the REPS requirements of Duke Energy Progress' retail customers.

Q. PLEASE DISCUSS DUKE ENERGY PROGRESS' REPS REQUIREMENTS FOR THE TEST AND BILLING PERIODS.

A. For the Test Period, the Company submitted for retirement 3,793,823 RECs to meet its Total Requirement. Within this total, the Company submitted for retirement 75,877 RECs to meet the Solar Set-Aside requirement, 195,649 RECs to meet the Poultry Waste Set-Aside requirement, and 26,557 RECs to meet the Swine Waste Set-Aside requirement. During the prospective

Billing Period, which spans two calendar years, with different requirements in each year, the Company's estimated requirements are as follows[4]:

In 2021, the Company estimates that it will be required to submit for retirement 4,521,086 RECs to meet its Total Requirement. Within this total, the Company is also required to retire the following: 72,338 solar RECs, 25,319 swine waste RECs and 251,548 poultry waste RECs.

In 2022, the Company estimates that it will be required to submit for retirement 4,663,823 RECs to meet its Total Requirement. Within this total, the Company estimates that it will be required to retire approximately 74,622 solar RECs, 52,235 swine waste RECs and 251,548 poultry waste RECs.

Q. HAS THE COMPANY COMPLIED WITH ITS GENERAL REQUIREMENT FOR 2020?

A. Yes, the Company has met its 2020 General Requirement of 3,495,740 RECs. Specifically, the RECs to be used for 2020 compliance have been transferred from the North Carolina Renewable Energy Tracking System ("NC-RETS") Progress Energy Electric Power Supplier account to the Progress Energy Compliance Sub-Account. Upon completion of this regulatory proceeding, the Commission will finalize retirement of the RECs.

Q. WILL THE COMPANY COMPLY WITH ITS GENERAL REPS REQUIREMENT IN 2021?

[4] The Company's projected requirements are based upon retail sales estimates and will be subject to change based upon actual prior year North Carolina retail sales data.

A. Yes, the Company is in a position to comply with its General REPS Requirement in 2021.

Q. WHAT ACTIONS HAS THE COMPANY TAKEN DURING THE TEST PERIOD TO SATISFY ITS CURRENT AND FUTURE REPS REQUIREMENTS?

A. During the Test Period, Duke Energy Progress has continued to produce and procure RECs to satisfy its REPS requirements. Specifically, the Company has taken the following actions: (1) executed and continued negotiations for additional REC purchase agreements with renewable facilities; (2) solicited renewable energy proposals of various types; (3) continued operations of its solar facilities; (4) continued to fully utilize energy savings generated by its energy efficiency programs, that can be counted towards the Company's REPS requirement; (5) performed research studies, both directly and through strategic partnerships, to enhance the Company's ability to comply with its future REPS requirements; and (6) executed a contract with a project selected in the second Tranche of the Competitive Procurement of Renewable Energy ("CPRE") Program of North Carolina House Bill 589 (S.L. 2017-192, "NC HB 589"), the RECs from which will be used to meet the Company's future REPS requirements.

Q. IS THE COMPANY ABLE TO USE RECS GENERATED FROM NET METERING FACILITIES TO SATISFY ITS FUTURE REPS REQUIREMENTS?

A. Yes. Under the current Net Metering for Renewable Energy Facilities Rider offered by DEP (Rider NM-4B), a customer receiving electric service under a schedule other than a time-of-use schedule with demand rates ("NMNTD customer") shall provide any RECs to DEP at no cost. Per the Commission's June 5, 2018 *Order Approving Rider and Granting Waiver Request* ("NMNTD Order") in Docket Nos. E-2, Sub 1106 and E-7, Sub 1113, for NMNTD customers, DEP may use the PVWatts™ Solar Calculator developed by the National Renewable Energy Laboratory ("NREL") for estimating the generation from NMNTD customers' solar facilities, as permitted by Commission Rule R8-67(g)(2). Commission Rule R8-67(g)(2) allows the use of a scalable conversion factor for estimating annual generation from program participants. DEP shall then report the total amount of electricity produced by facilities under the Rider directly into NC-RETS in a separately identified generation project. DEP has complied with these requirements and has estimated the annual generation from NMNTD customers' solar facilities using the approved scalable conversion factor and reported this generation to NC-RETS.

Q. ARE THERE OTHER COMPLIANCE REQUIREMENTS IN THE NMNTD ORDER WITH WHICH DEP MUST COMPLY?

A. Yes. The NMNTD Order also requires that DEP shall provide NC-RETS on a monthly basis with a list of participating customers, including location and the kW capacity of their installations, to be made available on the NC-

RETS website. DEP has complied, and continues to comply, with this requirement.

Q. HAVE THERE BEEN ANY CHANGES TO THE NUMBER OF DEP NET METERING RECS REPORTED TO NC-RETS OR THE MONTHLY LISTS OF NMNTD CUSTOMERS PROVIDED TO NC-RETS?

A. Yes. DEC and DEP (the "Companies") filed a letter on May 4, 2021 in Docket Nos. E-7, Subs 1113 and 1246 and Docket No. E-2, Sub 1106, advising the Commission that the Companies discovered an error in the amount of RECs from net metering facilities that each respective Company has reported to NC-RETS. As detailed in the letter, the Companies recently learned that some time-of-use demand ("TOUD") customers, from which the Companies do not own the rights to the RECs, have been inadvertently included in the monthly reports provided to NC-RETS, as well as in the calculation of RECs reported to NC-RETS annually. The letter details the cause of the error and the changes that have been made the ensure the correct customers and estimated generation are reported going forward. The letter also details the steps necessary to correct the historical production of net metering RECs reported by the Companies to NC-RETS. These steps were approved by the Commission in its May 11, 2021 *Order Granting Waiver Request and Approving Prior Period Adjustment.* The Companies worked with the NC-RETS Administrator to ensure the corrections were made to the NMNTD RECs historically reported to NC-RETS. The corrected

number of RECs generated from the NMNTD facilities are currently in DEP's REC inventory and available for use for future compliance requirements.

Q: DOES THE NMNTD ORDER REQUIRE DEP TO PERFORM SITE VISITS, AND IF SO, HAS DEP COMPLIED WITH THIS REQUIREMENT?

A. Yes, the NMNTD Order requires that, for two years, DEP shall verify through site visits to a statistically significant number of participating residences that the solar installations covered by this Rider continue to be operating and shall include the findings of its site visits in its annual REPS compliance filing.

DEP hired a third-party contractor, Pure Power Contractors, Inc., to perform the required site visits. A total of eighty-two site visits took place between September and November 2020, with inspections taking place in Raleigh, Cary, Asheville and Lumberton. The inspection process consisted of a visual inspection of the facility equipment, with the following data points collected at each facility:

- Energy production readings were taken from the inverter displays or monitoring equipment;
- Equipment make and model numbers;
- Weather conditions;
- Array tilt, azimuth and insolation readings; and
- Meter numbers.

Q. THROUGH THESE SITE VISITS, WAS IT DETERMINED THAT PRODUCTION FROM INSTALLED SYSTEMS MET EXPECTATIONS?

A. Yes, the site visits determined that production from installed systems has met expectations. For the net metering facilities included in the sample, the PVWatts™ Solar Calculator produced an average generation estimate of 8.526 MWh/yr. The historical production data collected from inverter readings during the site visits demonstrated an average production for the sample group of 8.246 MWh/yr. This resulted in an overall average realization rate of 97%, which is calculated by dividing the average verified annual production for the sample group by the average generation estimate produced by the PV Watts™ Solar Calculator. These findings indicate that the PVWatts™ production estimate methodology remains reasonable for predicting future MWh/yr. for program participants.

Since the results of the site visits in 2019 (95%) and 2020 (97%) indicate that the production from installed systems met, and continues to meet, expectations, the Company believes the PVWatts™ production estimate methodology remains accurate for predicting future production. Therefore, the Company recommends no changes to the production estimates and that no further site visits are necessary.

Q. HOW WILL THE CPRE PROGRAM OF NC HB 589 IMPACT DEP'S COMPLIANCE WITH ITS GENERAL REQUIREMENT?

A. Under G.S. § 62-110.8(a), DEC and DEP are responsible for procuring renewable energy and capacity through a competitive procurement program with the purpose of adding renewable energy to the state's generation portfolio in a manner that allows the Companies to continue to reliably and cost-effectively serve their customers' future energy needs. To meet the CPRE Program requirements, the Companies must issue requests for proposals to procure energy and capacity from renewable energy facilities in the aggregate amount of 2,660 MW (subject to adjustment in certain circumstances) reasonably allocated over a term of 45 months beginning on February 21, 2018, when the Commission approved the CPRE Program.

Renewable energy facilities eligible to participate in the CPRE solicitation(s) include those facilities that use renewable energy resources identified in G.S. § 62-133.8(a)(8), the REPS statute. The renewable energy facilities to be developed or acquired by the Companies, or procured from a third party through a power purchase agreement under the CPRE Program, must also deliver to the Companies the environmental and renewable attributes, or RECs, associated with the power. The first tranche of CPRE solicitations selected 2 projects for a total of 86 MW in the DEP service territory, and the second tranche selected 1 project for a total of 75 MW in the DEP service territory. The North Carolina retail allocated portion of the estimated REC production from these projects during the billing period can be found in Jennings Exhibit No. 2. DEP plans to use the RECs acquired through the CPRE RFP solicitations for its future REPS compliance

requirements and has therefore included the planned MW allocation and timeline in its REPS compliance planning process. Additional details regarding DEP's CPRE compliance activities for the current Test Period are being filed concurrently with this REPS filing and may be reviewed in Docket No. E-2, Sub 1275.

Q. HAS THE COMPANY COMPLIED WITH ITS SOLAR SET-ASIDE REQUIREMENT FOR 2020?

A. Yes, the Company has met the 2020 Solar Set-Aside requirement of 75,877 solar RECs. Pursuant to the NC-RETS Operating Procedures, the Company has submitted for retirement 75,877 solar RECs. Specifically, the RECs to be used for 2020 compliance have been transferred from the NC-RETS Progress Energy Electric Power Supplier account to the Progress Energy Compliance Sub-Account. Upon completion of this regulatory proceeding, the Commission will finalize retirement of the RECs.

Q. WILL THE COMPANY COMPLY WITH ITS SOLAR SET-ASIDE REQUIREMENT IN 2021?

A. Yes, the Company is well positioned to comply with its Solar Set-Aside requirement in 2021.

Q. PLEASE PROVIDE AN UPDATE ON THE COMPANY'S EFFORTS TO COMPLY WITH ITS SOLAR SET-ASIDE REQUIREMENT.

A. The Company is well positioned to comply with its Solar Set-Aside Requirement in 2021 through a diverse and balanced portfolio of solar resources. The Company's efforts to comply with the Solar Set-Aside

Requirement include REC generation and procurement from solar renewable energy facilities.

The Company continues to operate the following Company-owned solar facilities, the RECs from which are used for REPS compliance:

- Camp Lejeune Solar Facility – 13MW, located in Onslow County;
- Warsaw Solar Facility – 65MW, located in Duplin County;
- Fayetteville Solar Facility – 23MW, located in Bladen County; and
- Elm City Solar Facility – 40MW, located in Wilson County.

Q. HAS THE COMPANY COMPLIED WITH ITS POULTRY WASTE SET-ASIDE REQUIREMENT FOR 2020?

A. Yes, the Company has met the 2020 Poultry Waste requirement of 195,649 RECs. Pursuant to NC-RETS Operating Procedures, the Company has submitted for retirement 195,649 poultry RECs. Specifically, the RECs to be used for 2020 compliance have been transferred from the NC-RETS Progress Energy Electric Power Supplier account to the Progress Energy Compliance Sub-Account. Upon completion of this regulatory proceeding, the Commission will finalize retirement of the RECs.

Q. WILL THE COMPANY COMPLY WITH ITS POULTRY WASTE SET-ASIDE REQUIREMENT IN 2021?

A. The Company is in a position to comply with its Poultry Waste Set-Aside requirement in 2021. Future compliance is dependent on the performance of poultry waste-to-energy developers on current contracts, including one that was previously generating poultry RECs for DEP, but is currently

offline for repairs and modifications and is not expected to be generating RECs again until 2023.

Q. WHAT ACTIONS HAS THE COMPANY TAKEN DURING THE TEST PERIOD TO PROCURE OR DEVELOP POULTRY WASTE-TO-ENERGY RESOURCES TO SATISFY ITS POULTRY WASTE SET-ASIDE REQUIREMENTS?

A. In the Test Period, the Company (1) continued direct negotiations for additional supplies of both in-state and out-of-state resources with multiple counterparties; (2) secured contracts for additional poultry waste-to-energy resources; (3) worked diligently to understand the technological, permitting, and operational risks associated with various methods of producing qualifying poultry RECs to aid developers in overcoming those risks; when those risks could not be overcome, the Company worked with developers via contract amendments to adjust for more realistic outcomes; (4) explored leveraging current bioenergy contracts by working with developers to add poultry waste to their fuel mix; (5) explored adding thermal capabilities to current poultry sites to bolster REC production; (6) explored poultry-derived directed biogas at facilities located in North Carolina and directing such biogas to combined cycle plants for combustion and electric generation; (7) utilized the Company's REC trader to search the broker market for out-of-state poultry RECs available in the market; and (8) funded a North Carolina biogas utilization study through RTI International with hopes for future growth of poultry-derived directed biogas project

development. Additional information on the Company's compliance with the Poultry Waste Set-Aside requirement can be found in the Company's Joint Semiannual Progress Report, filed on June 1, 2021 in Docket No. E-100, Sub 113A.

The Company remains committed to satisfying its statutory requirements for the Poultry Waste Set-Aside and will continue to reasonably and prudently pursue procurement of these resources.

Q. HAS THE COMPANY COMPLIED WITH ITS SWINE WASTE SET-ASIDE REQUIREMENT FOR 2020?

A. Yes. The Company has met the 2020 Swine Waste Set-Aside requirement of 26,557 swine RECs. Pursuant to the NC-RETS Operating Procedures, the Company has submitted for retirement 26,557 swine RECs. Specifically, the RECs to be used for 2020 compliance have been transferred from the NC-RETS Progress Energy Electric Power Supplier account to the Progress Energy Compliance Sub-Account. Upon completion of this regulatory proceeding, the Commission will finalize retirement of the RECs.

Q. WILL THE COMPANY COMPLY WITH ITS SWINE WASTE SET-ASIDE REQUIREMENT IN 2021?

A. The Company is in a position to comply with its Swine Waste Set-Aside requirement in 2021. However, compliance with the swine waste set-aside for 2022 and beyond may be difficult to meet as the swine waste obligation increases. Existing contracts have not been able to reach contracted levels

of production, and new contracts have not come online in the timeframe originally planned and have taken longer than expected to ramp up production. One new swine waste-to-energy project is under construction and is scheduled to come online at the end of 2021. The ability of this new facility to come online and for all facilities to produce their full contracted RECs will determine the levels of compliance that DEP is able to meet in the near term.

Successfully developing additional swine-derived renewable natural gas ("RNG") projects in North Carolina has been a slow and tedious process over the last few years due to several factors. First, the Company understands that current swine waste-to-energy projects have encountered difficulties in achieving the full REC output of their contracts due to issues including local opposition to siting of the facilities, the inability to secure firm and reliable sources of swine waste feedstock from waste producers in North Carolina, difficulties securing project financing and technological challenges encountered when ramping up production. Second, the outbreak of the COVID-19 pandemic adversely impacted swine and poultry farms and processing plants in North Carolina through staff shortages, personal protective equipment supply issues, and delivery challenges in 2020 and 2021. COVID-19 has also created supply shortages and price increases for equipment and building materials and has increased wait times on development of new facilities. Third, developers have communicated potential delays as they work through the regulatory process and other

stakeholder concerns to their development plans. On December 7, 2020 Optima MH filed a motion for declaratory relief in Docket No. E-100, Sub 113. The uncertainty of a Commission order in that proceeding has had an impact on negotiations between the Companies and other developers. Final comments were filed on April 12, 2021, and the parties are awaiting an order from the Commission.

Additionally, DEP's ability to offer longer-term fixed-price contracts was previously an advantage over the California RNG market. However, financiers have now developed structures that allow manure-based RNG projects with low carbon intensity scores to obtain premium pricing for up to 10 years, which is leading to increased cost of swine-derived RNG for DEP.

Q. WHAT ACTIONS HAS THE COMPANY TAKEN DURING THE TEST PERIOD TO PROCURE OR DEVELOP SWINE WASTE-TO-ENERGY RESOURCES TO MEET ITS SWINE WASTE SET-ASIDE REQUIREMENT?

A. In the Test Period, the Company (1) continued direct negotiations for additional supplies of both in-state and out-of-state resources; (2) continued pursuit of swine-derived directed biogas from North Carolina facilities, working with Piedmont Natural Gas Company, Inc. to locate favorable biogas injection sites; (3) worked diligently to understand the technological, permitting, and operational risks associated with various methods of producing qualifying swine waste RECs to aid developers in overcoming

those risks; when those risks could not be overcome, the Company worked with developers via contract amendments to adjust for outcomes that the developers believe are achievable based on new experience; (4) explored and is engaging in modification of current bioenergy and set-asides contracts by working with developers to add swine waste to their fuel mix; (5) utilized the Company's REC trader to search the broker market for out-of-state swine RECs available in the market; (6) continued support of research through North Carolina State University ("NCSU" or "NC State University") associated with on-farm swine waste drying technology and mortality combustion possibilities as well as funding a North Carolina biogas utilization study through RTI International with hopes for future growth of swine-derived directed biogas project development; and (7) engaged the North Carolina Pork Council ("NCPC") in a project evaluation collaboration effort that will allow the Company and the NCPC to discuss project viability, as appropriate, with respect to the Company's obligations to keep certain sensitive commercial information confidential. Additional information on the Company's compliance with the Swine Waste Set-Aside requirement can be found in the Company's Joint Semiannual Progress Report, filed on June 1, 2021 in Docket No. E-100, Sub 113A.

The Company remains committed to satisfying its statutory requirements for the Swine Waste Set-Aside and will continue to reasonably and prudently pursue procurement of these resources.

Q. IS DUKE ENERGY PROGRESS CONTINUING TO EXECUTE ADDITIONAL REC PURCHASE AGREEMENTS?

A. Yes, the Company continues to execute additional REC purchase agreements and maintains an open solicitation for proposals from developers of renewable energy resources.

Q. DID THE COMPANY SELL ANY RECS DURING THE TEST PERIOD?

A. No, it did not.

Costs of REPS Compliance

Q. WHAT ARE THE COMPANY'S COSTS ASSOCIATED WITH REPS COMPLIANCE DURING THIS TEST PERIOD AND THE UPCOMING BILLING PERIOD?

A. Duke Energy Progress' costs associated with REPS compliance are reflected in Jennings Confidential Exhibit No. 2 and are categorized by actual costs incurred during the Test Period and projected costs for the Billing Period.

Q. IN ADDITION TO RENEWABLE ENERGY AND REC COSTS, WHAT OTHER COSTS OF REPS COMPLIANCE DOES THE COMPANY SEEK TO RECOVER IN THIS PROCEEDING?

A. Jennings Confidential Exhibit Nos. 2 and 3 identify "Other Incremental Cost," "Solar Rebate Program Cost" and "Research Cost" that the Company has incurred, and estimates it will incur, in association with REPS compliance.

Other Incremental Costs and Solar Rebate Program Costs

Q. PLEASE EXPLAIN THE OTHER INCREMENTAL COSTS INCLUDED FOR RECOVERY IN THIS PROCEEDING.

A. Other Incremental Costs include labor costs associated with REPS compliance activities and non-labor costs associated with administration of REPS compliance. Among the non-labor costs associated with REPS compliance are the Company's subscription to NC-RETS, and accounting, and tracking tools related to RECs, reduced by agreed-upon liquidated damages paid by sellers for failure to meet contractual milestones, and amounts paid for administrative contractual amendments requested by sellers.

Q. PLEASE PROVIDE INFORMATION ON THE NC HB 589 SOLAR REBATE PROGRAM ("SOLAR REBATE PROGRAM").

A. As required by G.S. § 62-155(f), DEP developed a Solar Rebate Program offering reasonable incentives to residential and nonresidential customers for the installation of small customer owned or leased solar energy facilities participating in the Company's net metering tariff. The incentive is limited to 10 kilowatts alternating current ("kW AC") for residential solar installations and 100 kW-AC for nonresidential solar installations. HB 589 limited the program incentive to 10,000 kW of installed capacity annually starting January 1, 2018 and continuing until December 31, 2022.

Consistent with the Commission's April 3, 2018 order and subsequent orders in Docket Nos. E-7, Sub 1166 and E-2, Sub 1167, the

Solar Rebate Program launched on July 9, 2018. In every year since its launch, the Solar Rebate Program's annual participation limits for the residential and non-residential class have been met, although the two thousand five hundred kW of capacity limit for nonprofit organizations has not been met.

On April 1, 2020, DEP filed its Solar Rebate Program Annual Report for 2019, which included: (i) information on problems encountered with the 2020 solar rebate application process due to a website malfunction, (ii) the Company's commitment to technological fixes, and (iii) proposed changes to the program to avoid a recurrence of the problems in future years, including a request to amend the program application windows for 2021 and 2022. The NCUC subsequently issued an *Order Allowing Comments on 2019 Annual Report*, through which parties could propose their own changes to the program for the Commission's consideration. Multiple parties filed comments and reply comments, which were followed by a November 6, 2020 *Order Modifying Fourth Year of Solar Rebate Program and Requesting Additional Comments* ("November 2020 Order"). Included in the November 2020 Order, the Commission approved the Companies' recommendation that half of the available annual capacity each year be offered in January and half in July. Thus, the first window of the 2021 program opened on January 6 with incentive amounts remaining at the 2020 levels of $0.60 per watt for residential customer installations, $0.50 per watt for commercial customer installations, and $0.75 per watt for nonprofit customers. On January 8, 2021, DEP filed a notice that the participation limit

for the first window of 2021 for residential and nonresidential customers under the Solar Rebate Program, exclusive of the nonprofit participation set-aside, was reached quickly.

Also in its November 2020 Order, the Commission solicited comments recommending revised rebate amounts for residential, commercial, and nonprofit customers for consideration to be effective for the application window opening on July 7, 2021, with particular interest in the viability of a tiered system aimed at incentivizing smaller solar installations with a declining incentive structure up to 10 kW for residential customer installations and 100 kW for nonresidential customer installations. Parties filed comments in December 2020 with their recommendations, in which the Companies proposed that a preferable approach would be to decrease the residential rebate to $0.40 per watt and reduce the commercial rebate to $0.30 per watt, keeping the nonprofit rebate at $0.75, in coordination with the elimination of a tiered incentive structure. However, if the Commission determined that a tiered rebate was necessary, the Companies recommended $0.50/watt for the first 5 kW of a residential system and $0.40/watt for additional capacity to the 10 kW limit. After reviewing all the parties' comments, on December 30, 2020, the NCUC issued an *Order Requiring Additional Information*, in which it required the Companies to respond to five questions, including information related to the January 2021 launch. The Companies filed their response to the NCUC's questions on January 25, 2021.

On March 3, 2021, the Companies filed an *Application for Approval to Revise Solar Rebate Program* in which they requested that the Commission:

(1) implement a lottery for the Solar Rebate Program, beginning with the July 2021 launch,

(2) eliminate the 90-day rule, such that customers who installed a system on or after October 6, 2020 will be eligible to apply for future rebates, and

(3) allow residential customers and nonresidential customers under 20 kW 180 days from the rebate reservation award to install their systems, with the exception of nonprofit systems.

On March 23, 2021, the Commission issued its *Order Modifying Solar Rebate Program and Allowing Comments*. In this Order, the Commission granted Duke's request to implement a lottery for the solar rebate program, beginning with the July 2021 application period. In addition, the Commission approved reduced incentive amounts for residential and commercial customers to reflect the current reasonable cost of solar installations. Beginning with the July 7, 2021 launch, the reduced incentive amounts are: $0.40 per watt for residential customer installations, $0.30 per watt for commercial customer installations. The incentive for nonprofit customer installations remains at $0.75 per watt. The Commission did not approve Duke's requests to eliminate the 90-day rule or modify the installation period, but requested additional information and proposals

regarding installation time periods for residential customers and under 20 kW commercial customers that are less than 180 days, in order to allow uninstalled capacity to be allocated to customers waitlisted during that enrollment period or to allow more capacity to be included in the following lottery. The Companies included two proposals for the Commission to consider in their Joint Annual Solar Rebate Program Annual Report and Request to Amend Program Application Periods filed April 1, 2021. Final comments were due on June 14, 2021, and the parties are awaiting an Order from the Commission.

Q. ARE COSTS RELATED TO THE NC HB 589 SOLAR REBATE PROGRAM INCLUDED FOR RECOVERY IN THIS FILING?

A. Yes. Pursuant to G.S. § 62-155(f), each public utility required to offer a solar rebate program "shall be authorized to recover all reasonable and prudent costs of incentives provided to customers and program administrative costs by amortizing the total program incentives distributed during a calendar year and administrative costs over a 20-year period, including a return component adjusted for income taxes at the utility's overall weighted average cost of capital established in its most recent general rate case, which shall be included in the costs recoverable by the public utility pursuant to G.S. § 62-133.8(h)." G.S. § 62-133.8(h) provides for an electric power supplier's cost recovery and customer charges under the REPS statute; NC HB 589 amended it by adding a provision to allow for the recovery of incremental costs incurred to "provide incentives to

customers, including program costs, incurred pursuant to G.S. § 62-155(f)." Therefore, DEP has included for recovery in this filing costs incurred during the EMF period, and projected to be incurred in the Billing Period, related to the implementation of the NC HB 589 Solar Rebate Program. As detailed on Jennings Confidential Exhibit No. 3, these costs include the annual amortization of incentives paid to customers and program administration costs, which include labor, information technology and marketing costs. Projected incentive costs for the Billing Period are based on the currently approved rebate amounts.

Q. PLEASE PROVIDE DETAIL ON THE INTERNAL LABOR COSTS THAT ARE ASSOCIATED WITH REPS COMPLIANCE AND SOLAR REBATE PROGRAM ACTIVITIES THAT ARE INCLUDED IN DEP'S CURRENT APPLICATION FOR REPS COST RECOVERY.

A. DEP charges only the incremental cost of REPS compliance and the Solar Rebate Program to the REPS cost recovery rider. Consistent with that policy and DEP's practices in previous applications for cost recovery for REPS compliance, internal employees who work to comply with G.S. § 62-133.8 and G.S. § 62-155(f) charge only that portion of their labor to REPS. The departments/functions that charged labor to REPS during the Test Period are detailed in Jennings Confidential Exhibit No. 3.

Q. HOW DO EMPLOYEES CHARGE THEIR REPS-RELATED AND SOLAR REBATE PROGRAM-RELATED LABOR COSTS TO REPS?

A. Employees positively report their time, which means that each employee is required to submit a timesheet every two weeks in DEP's time reporting system. The hours reported for the period are split according to the accounting entered in the time reporting system for that specific employee. The division of hours is updated for the reporting period as necessary, as the nature of the employee's work changes.

To educate employees to account for their time properly, DEP annually provides instructions for charging time to REPS to affected employees and the management of the employee groups performing REPS work. Additionally, every year prior to filing for approval of the DEP REPS Compliance Report and Cost-Recovery Rider, the labor hours charged are carefully reviewed and confirmed.

Research Costs

With respect to Research activities during the Test Period and projected for the Billing Period, the Company has incurred or projects to incur costs associated with the support of various pilot projects and studies related to distributed energy technology and the Company's REPS compliance.

Q. THE COMMISSION'S *ORDER APPROVING REPS AND REPS EMF RIDERS AND 2012 REPS COMPLIANCE* REQUIRES DUKE ENERGY PROGRESS TO FILE WITH ITS 2020 REPS RIDER

APPLICATION STUDY RESULTS FOR ANY STUDIES THE COSTS OF WHICH IT HAS RECOVERED VIA THE REPS RIDER. IS THE COMPANY SUPPLYING SUCH STUDIES IN THIS FILING?

A. Yes. The Company's Research efforts are an integral part of its REPS compliance efforts. The following summary outlines efforts undertaken by the Company in the test period and specifies the availability of applicable study results.

- Astrape – Battery Storage Effective Load Carrying Capability ("ELCC") Study – In 2020, the Company contracted with Astrape Consulting to analyze the capacity value of battery technology within the Company's system. The study results provide the capacity value for battery energy storage systems used in the Company's Integrated Resource Plans. The results of this project can be found in Jennings Exhibit No. 4.
- Coalition for Renewable Natural Gas – The Company renewed its membership to the Coalition for Renewable Natural Gas in 2020, to add a valuable resource of knowledge and public policy advocation in this growing sector of potential animal waste supply. The Coalition for Renewable Natural Gas provides its members with exclusive whitepapers, support on model pipeline gas specifications and access to other members for discussions on current and future projects. Additionally in 2021, the Company provided funding

through the Coalition for Renewable Natural Gas for a study by Colorado State University of methane leakage from RNG processing facilities to promote improved practices; a literature review and scientific journal article on the benefits and challenges of RNG to be authored by researchers at Duke University and Stanford University; a white paper on the sustainability profile of RNG authored by Professors at Rutgers University; and a national benchmark survey on RNG understanding and sentiment conducted by 3Degrees. The survey has been completed and is included as Jennings Confidential Exhibit No. 5. The remaining studies are still underway, the results of which will be included in next year's filing.

- Eos Energy Storage Technology Development – The Company and Eos Services started a collaborative technology development program to validate, demonstrate, and quantify the benefits of an Eos Aurora Battery System that is DC coupled to a PV facility at the McAlpine Creek Substation 50 kW Solar Facility. The installation of the Eos Aurora Battery System was completed in 2019, and operational tests continued in 2020. The progress report of this project can be found in Jennings Confidential Exhibit No. 6.
- Electric Power Research Institute ("EPRI") – In the EMF period, the Company subscribed to the following EPRI programs, the costs of which were recovered via the REPS rider: Program 174 – Integration of Distributed Energy Resources, and Program 94 –

Energy Storage and Distributed Generation. The Company completed a supplemental project under Program 174 – "DER Interconnection Standards & Practices." The Company also started two new supplemental projects under Program 174 – "Field Validation Tool for Smart Inverter Configuration and Settings" and "Model-Based Analysis of DER Functions and Settings." EPRI designates such study results as proprietary or as trade secrets and licenses such results to EPRI members, including Duke Energy Progress. As such, the Company may not disclose the information publicly. Non-members may access these studies for a fee. Information regarding access to this information can be found at http://www.epri.com/Pages/Default.aspx.

- Electric Power Research Institute ("EPRI") – Inverter Reactive Power and Voltage Control Effectiveness and Application Study – In 2020, the Company contracted with EPRI to continue the evaluation of the software-based controls of advanced inverters according to the IEEE 1547-2018 standard. This study plans to evaluate the impact of multiple DER power factor capabilities, use of feeder head capacitor compensation for DER reactive power absorption, benefits and application of voltage dependent and voltage independent control methods, and the effectiveness of local controls on other power system voltage regulation devices on the feeder with the inverter reactive controls. The study started in Q4

2020 and is currently in progress. The description and update of this study can be found in Jennings Exhibit No. 7.

- Emerging Technology Office ("ETO") – Control Hardware-in-the Loop (CHIL) Circuit and DER Simulation – In 2020, the Company contracted with Open Energy Solutions ("OES") to research the potential benefits and impacts of DER and microgrids utilizing a CHIL simulation model that utilities can use to test and simulate different solution and distribution grid configurations prior to actual installation on its distribution circuit. The study outlines a process using CHIL to evaluate protection and coordination risk associated with high penetration DER. The results of this project can be found in Jennings Confidential Exhibit Nos. 8 and 9.
- Institute for Electrical and Electronics Engineers ("IEEE") 1547 Conformity Assessment Education and Credentialing Program Development – The Company has previously sponsored two IEEE 1547 Conformity Assessment pilot projects in 2018 and 2019. In 2020, the Company joined teams with IEEE Standard Association and four other utilities to create a credentialing program that will train and certify individuals who can verify any installed DER Interconnection for its compliance with the IEEE 1547-2018 standard and local jurisdictional requirements. This project will continue in 2021. The 2020 deliverable of this project can be found in Jennings Confidential Exhibit No. 10.

- Navigant – Impact of Enabling Inverter Based Resource Reactive Power Controls – In 2020, the Company completed a project with Navigant Consulting to evaluate the software-based controls of advanced inverters according to the IEEE 1547-2018 standard. This study evaluates voltage-reactive power and voltage-active power control functions for feeders in the Company's system. It was part of the collaborative stakeholder process for analyzing smart inverter control functionalities consistent with IEEE 1547-2018. The results of this study can be found in Jennings Exhibit No. 11.
- NCSU – Adopting DVAR to Mitigate PV Impacts on a Distribution System – In 2020, the Company continued the project with NC State University to assess the effectiveness of the American Superconductor Corp. Dynamic Volt-Amp Reactive Compensation Solution ("mini-DVAR") in mitigating various power quality issues on distribution circuits due to increasing penetration of PV. The scope of the project in 2020 focused on the optimal placement of mini-DVAR and its optimal volt-var control. The project is expected to continue in 2021 to further optimize the control settings. The report of mini-DVAR optimal placement can be found in Jennings Confidential Exhibit No. 12.
- NCSU - Distributed Generation ("DG") Cost of Service Study – In 2020, the Company teamed up with NC State University and Advanced Energy to perform a study to determine the cost-of-

service impacts of DG. This study focuses on the Operations and Maintenance and planning costs the utility incurs due to the DG impact on the system, and develops a methodology for their quantification. The progress report for this project can be found in Jennings Confidential Exhibit Nos. 13 and 14.

- NCSU's Future Renewable Electric Energy Delivery and Management ("FREEDM") Systems Center – Duke Energy supports NC State's FREEDM Center through annual membership dues. The FREEDM partnership provides Duke Energy with the ability to influence and focus research on materials, technology, and products that will enable the utility industry to transform the electric grid into a two-way power flow system supporting distributed generation.
- NCSU – Low Energy Drying of Swine Sludge – The Animal and Poultry Waste Management Center ("APWMC") at NC State University – In 2020, the Company continued support of the various projects being undertaken by the APWMC. This work is centered around drying swine lagoon solids, bagged lagoon sludge and lagoon sludge mixed with agricultural wastes at a farm-based level to create a higher MMBtu fuel that can be safely and easily transported to a central plant for combustion. An update on the project can be found in Jennings Confidential Exhibit No. 15.

- NREL – Carbon-Free Resource Integration Study – In 2020, the Company contracted with NREL to conduct a study of the Carolinas' system to help us understand the operational impacts, benefits and limitations of solar. The study will also inform other fleet transformation analyses, including how different clean energy technologies can contribute to a carbon-free future. The study will be conducted in two phases. Phase 1 was completed in 2019, and the Phase 1 report can be found in Jennings Exhibit No. 16. Phase 2 continued in 2020 and will be completed in 2021. The interim Phase 2 report can be found in Jennings Exhibit No. 17.
- PNNL – Dynamic Var Compensator ("DVC") Pilot – Starting in 2018, the Company worked with One-Cycle Control, Inc. and Pacific Northwest National Laboratory ("PNNL") on a project, which is part of DOE SunlAmp Contract: 0000-1714, to install and commission two DVC devices in the Company's distribution system, and to evaluate its performance in mitigating the voltage variability due to high penetration of distributed photovoltaic on a distribution feeder. The project concluded in 2019. The cost of the decommissioning of the devices was incurred in 2020.
- Research Triangle Institute – Biogas Utilization in North Carolina – In 2020, the Company continued support of the Research Triangle Institute project for the NC Energy Policy Council to determine the potential bioenergy/biogas resources available in North Carolina,

and to identify the most beneficial and optimum utilization of resources to maximize economic, environmental and societal advantages. An overview of the project can be found in Jennings Confidential Exhibit No. 18.

- Smart Electric Power Alliance ("SEPA") – The Company renewed its membership to the Smart Electric Power Alliance in 2020. SEPA provides its members with exclusive whitepapers and working group event opportunities on various topics including DER integration, DER management systems, energy efficiency and demand response, electric vehicle development, microgrid and grid resiliency. Please visit SEPA's website at https://sepapower.org/ for more information on SEPA.
- Southeast Wind Coalition ("SEWC") – The Company renewed its membership in the Southeast Wind Coalition in 2020. SEWC conducts research on land-based wind, offshore wind, and energy storage, which informs the Company of potential renewable generation opportunities that may enable the Company to comply with REPS in a cost-effective manner. In addition, SEWC's work is to advance wind policies across the southeast by holding conferences, addressing prohibitive state policies related to wind deployment, and ensuring workforce development and educational outreach. Please visit SEWC's website at https://www.sewind.org/ for more information on SEWC.

- University of North Carolina Charlotte ("UNCC") – Energy Storage Integration Study – In 2020, the Company contracted with UNCC to study the Grid Ancillary Uninterruptible Power Supplies ("GAUPS") and its utilization for modern sensitive and non-sensitive critical loads alongside providing grid ancillary services. The study results encapsulate the design and prototyping of the GAUPS. The project was previously reported as "Marshall Solar Site Algorithm - Phase V." However, the scope of research has been shifted from solar and energy storage control algorithm to energy storage integration and application. Hence, the Company and UNCC updated the project name to better reflect the study scope. The Company is continuing to support the next phase of this project in 2021. The results of this project can be found in Jennings Confidential Exhibit No. 19.

Q. ARE YOU SATISFIED THAT THE ACTUAL COSTS INCURRED IN THE TEST PERIOD HAVE BEEN, AND THAT THE PROJECTED COSTS OF THE BILLING PERIOD WILL BE, PRUDENTLY INCURRED?

A. Yes. Duke Energy Progress believes it has incurred and projects to incur these costs associated with REPS compliance in a prudent manner. The Company continues to exercise thorough and rigorous technical and economic analysis to evaluate all options for compliance with its REPS requirements. Duke Energy Progress has developed strong foundational

market knowledge related to renewable resources. The Company continues to enhance and develop expertise in this field through the Company's various solicitations for renewable energy and the operation of its unsolicited bid process, its participation in industry research, and daily interaction with developers of renewable energy facilities. As a result of these efforts, the Company has been able to identify, procure, and develop a diverse portfolio of renewable resources to meet its REPS requirements in a prudent, reasonable and cost-effective manner.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.