BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1276

In the Matter of:	)	
	)	**DIRECT TESTIMONY OF**
Application of Duke Energy Carolinas, LLC	)	**JUSTIN C. LAROCHE**
For Adjustment of Rates and Charges Applicable	)	**FOR DUKE ENERGY**
to Electric Service in North Carolina and	)	**CAROLINAS, LLC**
Performance-Based Regulation	)	

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is Justin C. LaRoche. My business address is 400 South Tryon Street, Charlotte, North Carolina 28202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Duke Energy Corporation ("Duke Energy") as a Director of Renewable Development.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND.

A. I have a bachelor's degree in Accounting from the University of North Carolina Belk College of Business and a master's degree in business administration from the University of South Carolina Darla Moore School of Business. I began my career with Duke Energy in 2008 as an intern where I supported initiatives within corporate finance, energy efficiency, and regulated renewables. From 2010 to 2012, I served as a project manager within the grid modernization group, after which I returned to regulated renewables in 2012. Since 2014, I have been supporting and leading Duke Energy's renewable investments in solar and wind facilities throughout our regulated service territory.

Q. WHAT ARE YOUR DUTIES AS DIRECTOR OF RENEWABLE DEVELOPMENT?

A. I oversee the development of new renewable facilities, including solar and wind, on behalf of Duke Energy's regulated utilities, including Duke Energy Carolinas, LLC ("DEC" or the "Company"). In my current role, I am responsible for conducting solar development activities, including project

siting, land acquisition, resource assessment, permitting, obtaining interconnection rights, project layout and design, and arranging contracts for engineering, procurement and construction services, as well as originating, structuring, and executing transactions to acquire rights to existing solar development projects from third-party developers.

Q. HAVE YOU TESTIFIED BEFORE THE NORTH CAROLINA UTILITIES COMMISSION ("COMMISSION") IN ANY PRIOR PROCEEDINGS?

A. No. However, I did submit pre-filed direct testimony before this Commission in Duke Energy Progress, LLC's ("DEP") 2022 Rate Case in Docket No. E-2, Sub 1300.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. My testimony and exhibits support the 2026 Solar Procurement Program Investment ("2026 Solar Investment") that is included in DEC's multiyear rate plan ("MYRP"). My testimony discusses how the 2026 Solar Investment will further important policy goals and benefit DEC customers. I also explain and provide support for DEC's request for a 35-year depreciable life for the 2026 Solar Investment and for future solar facilities.

Q. DOES YOUR TESTIMONY INCLUDE EXHIBITS?

A. Yes. My testimony includes the following four exhibits:

- LaRoche Exhibit 1 details the reason, scope, and timing of the 2026 Solar Investment, including the projected in-service month and year.

- LaRoche Exhibit 2 includes a map showing the approximate locations of all utility track bids submitted into the 2022 Solar Procurement Program ("2022 SP Program") Request for Proposals ("RFP").
- LaRoche Exhibit 3 provides the cost breakdown for the 2026 Solar Investment.
- LaRoche Exhibit 4 provides a summary table of the present value of revenue requirements ("PVRR") for the various tax credit scenarios likely for the 2026 Solar Investment.

II. 2026 SOLAR INVESTMENT OVERVIEW

Q. PLEASE DISCUSS KEY DRIVERS BEHIND THE 2026 SOLAR INVESTMENT.

A. On October 13, 2021, North Carolina Governor Roy Cooper signed into law House Bill 951[1] ("HB 951"). HB 951 puts North Carolina at the forefront of the clean energy transition and modernizes the regulatory framework by authorizing the use of performance-based ratemaking ("PBR"). HB 951 requires that DEC and DEP (collectively the "Companies") take all reasonable steps to achieve 70% carbon emission reductions by 2030 and carbon neutrality in North Carolina by 2050. Specifically, HB 951 provides that 55% of all new solar generation under a proposed carbon plan is to be "supplied from solar energy facilities that are utility-built or purchased by the utility from third parties and owned and operated and recovered on a cost-of-service basis by the

[1] 2021 N.C. Sess. Laws 165.

soliciting electric public utility."[2]

The 2026 Solar Investment also aligns with the 2022 Carolinas Carbon Plan ("Carbon Plan")[3] solar targets. Importantly, all Carbon Plan portfolios assume a significant expansion of solar resources in the Carolinas[4] and DEC expects that a portion of these resources will be located within DEC's service territory. To achieve these goals, the Companies initiated the 2022 SP Program to procure new solar resources that the Carbon Plan specifically identified as being needed in 2026. In addition, DEC's most recent integrated resource plans, filed with the Commission and the Public Service Commission of South Carolina, also identified the need for new solar resources to reliably serve DEC's projected customer load.

[2] 2021 N.C. Sess. Laws 165 § (1).2.b. The remaining 45% of all new solar generation procured under the Carbon Plan shall be supplied through the execution of PPAs with third parties pursuant to which the electric public utility purchases solar energy, capacity, and environmental and renewable attributes from solar energy facilities owned and operated by third parties that are 80 megawatts-alternating current or less that commit to allow the procuring electric public utility rights to dispatch, operate, and control the solicited solar energy facilities in the same manner as the utility's own generating resources.

[3] *Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's Verified Petition for Approval of Carbon Plan,* Docket No. E-100, Sub 179 (May 16, 2022).

[4] Appendix I - Solar, Carolinas Carbon Plan (May 16, 2022) at 1 https://starw1.ncuc.gov/NCUC/ViewFile.aspx?Id=0f3bac67-2d25-4480-beaf-12c93804691b ("As of December 31, 2021, approximately 4,350 megawatts ("MW") of utility-scale solar is connected to the [DEC] and [DEP] systems," and this amount "will need to at least double over the next 8 years (2022-2030), adding approximately 5,980 to 7,930 MW of incremental solar, which will cause the total solar to grow to as much as 10,350 to 12,300 MW."). Specifically, the Carbon Plan calls for a minimum of 3.8 GWs of new solar capacity by year end 2030 (Portfolio 2), and 6.8 GWs on the high end (Portfolio 1), to meet these carbon reduction targets. Portfolio 3 calls for 3.8 GWs of new solar by year end 2030 and Portfolio 4 calls for 4.3 GWs. Five of the six Carbon Plan portfolios specifically call for at least 750 MWs of new solar resources by December 31, 2026. The Companies filed supplemental modeling portfolios - Portfolios 5 and 6 - based on recommendations by the Public Staff and the Commisison, as a part of the Carbon Plan's Direct Testimony and Exhibits. *See Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's Carbon Plan Direct Testimony and Exhibits*, Docket E-100, Sub 179 (Aug. 19, 2022). Portfolios 1, 3, and 4 call for 750 MWs by year end 2026, Portfolio 2 calls for 375 MWs.

Q. DOES DEC'S MYRP INCLUDE SOLAR PROJECTS UNDERTAKEN PURSUANT TO THE 2026 SOLAR INVESTMENT?

A. Yes. The 2026 Solar Investment is included in DEC's proposed MYRP. The testimony and exhibits of Witnesses Laura Bateman and Phillip Stillman ("PBR Policy Panel") describe DEC's PBR Application, including the policy and public interest reasons supporting Commission approval of the PBR Application, and other DEC witnesses provide detailed information about the projects included in the MYRP. The remainder of my testimony is focused on the solar projects included in DEC's PBR Application.

Q. PLEASE DESCRIBE THE 2026 SOLAR INVESTMENT [COMMISSION RULE R1-17B(d)(2)j.(i)-(iii)].

A. DEC anticipates procuring 165 MWs of solar as part of the 2026 Solar Investment, which will result in multiple projects being selected as part of the 2022 SP RFP. The projected in-service date for these solar facilities is June 1, 2026. Consistent with the requirements of Commission Rule R1-17B(d)(2)j.(i)-(iii), LaRoche Exhibit 1 details the reason, scope, and timing of projects undertaken pursuant to the 2026 Solar Investment.

Q. HOW DID DEC DEVELOP AND SELECT THE 2026 SOLAR INVESTMENT FOR INCLUSION IN DEC'S MYRP?

A. DEC examined the solar pipeline for discrete and identifiable solar projects that would be placed in service within the MYRP period (January 2024 – December 2026). As part of this process, DEC considered potential solar investments that would be included in, or required by, the Carbon Plan and the 2022 SP

Program.[5]

Q. PLEASE DISCUSS THE NEED FOR THE 2026 SOLAR INVESTMENT [COMMISSION RULE R1-17B(d)(2)j(i)].

A. The 2026 Solar Investment furthers several of the public policy goals (detailed in the testimony of the PBR Policy Panel) that the Commission may consider in evaluating a PBR Application. Specifically, the 2026 Solar Investment encourages utility-scale solar development and deployment, reduced carbon reductions, encourages distributed energy resources, maintains grid reliability, and promotes local community clean energy investment. Furthermore, the 2026 Solar Investment will help DEC achieve the solar procurement goals outlined in both the 2022 SP Program and Carbon Plan. Finally, this investment is consistent with prudent utility planning practices.

Q. WHAT IS THE ESTIMATED SCHEDULE FOR THE 2026 SOLAR INVESTMENT [COMMISSION RULE R1-17B(d)(2)j(iii)]?

A. Projects included as a part of the 2026 Solar Investment will be selected through the 2022 SP Program. The Commission approved the 2022 SP Program targeted procurement volume on November 1, 2022[6] and the 2022 SP RFP had robust participation—a total of 45 projects were submitted under the Utility Ownership Track. LaRoche Exhibit 2 includes a map showing the approximate locations of all utility track bids submitted into the RFP. The RFP evaluations

[5] *2022 Solar Procurement Request for Proposals for New Solar Resources*, Docket Nos. E-2, Sub 1297 and E-7, Sub 1268 (June 1, 2022) ("2022 SP Program RFP").

[6] *Order Permitting Additional CPRE Program Procurement and Establishing Target Procurement Volume for the 2022 Solar Procurement*, Docket Nos. E-2, Sub 1159, E-2, Sub 1297, E-7, Sub 1156 and E-7, Sub 1268 (November 1, 2022).

and anticipated dates relevant to Step 1 and Step 2 are as follows:

- Step 1: Evaluations have been completed and early winner notifications were sent on November 28, 2022—One Utility Ownership Track bid qualified as an early winner. The early winner must execute the applicable agreement by January 20, 2023, to accept the award.
- Step 2: DEC expects that Step 2 evaluations and final winners will be selected by May 11, 2023. Following bid awards, Utility Ownership Track winners will execute applicable agreements by June 14, 2023.

DEC anticipates that early and final winner projects (Step 1 and Step 2) will be placed in-service by June 1, 2026.

Q. HAS DEC ESTIMATED POTENTIAL OPERATING BENEFITS ASSOCIATED WITH THE 2026 SOLAR INVESTMENT [COMMISSION RULE R1-17B(d)(2)k]?

A. Yes. Projects undertaken pursuant to the 2026 Solar Investment may qualify for certain credits under the recently enacted Inflation Reduction Act of 2022 ("IRA"). Potential IRA impacts and savings constitute "operational benefits" within the meaning of N.C. Gen. Stat. § 62-133.16(c)(1)(a). Witness John R. Panizza summarizes the key tax-related components of the IRA and previews provisions most relevant to DEC's proposed MYRP. Witness Panizza also highlights the uncertainties surrounding the tax credits made available by the IRA and addresses certain assumptions that DEC is making with regard to the various tax credits. Witness Kathryn Taylor's Exhibit 4 shows the revenue requirement calculations for the MYRP projects and includes an estimated

revenue requirement impact associated with potential IRA tax credits. Below, I discuss the potential benefits that may be achieved by solar projects as a result of the IRA.

Q. WILL THE SOLAR PROJECTS UNDERTAKEN PURSUANT TO THE 2026 SOLAR INVESTMENT QUALIFY FOR TAX CREDITS UNDER THE IRA?

A. Yes. As mentioned above, the solar projects proposed in this case will be eligible for either the investment tax credit ("ITC") or the ten-year production tax credit ("PTC").

Q. WHICH IRA TAX CREDIT HAS DEC SELECTED FOR THE 2026 SOLAR INVESTMENT?

A. At this time, DEC has not decided whether it will choose the ITC or PTC. DEC will likely select an option prior to the start of construction. At that time, DEC will have more information available that will help inform this decision, including more detailed cost estimates, more detailed guidance from Treasury and the IRS, and qualification guidelines for various credit provisions will have been determined.

Q. DID DEC MAKE CERTAIN ASSUMPTIONS OR MODEL SCENARIOS RELATED TO IRA CREDIT OPTIONS FOR THE 2026 SOLAR INVESTMENT?

A. Yes. The DEC MYRP revenue requirement calculations prepared by Witness Taylor assume that DEC will select the PTC option[7] for the 2026 Solar

[7] The PTC option assumes PTC base credit plus prevailing wage and apprenticeship added but excludes domestic content and energy communities' bonuses.

Investment, consistent with Witness Panizza's testimony. This assumption is also supported by the comparison and analysis illustrated in LaRoche Exhibit 4. Additionally, the generation and PTC rate assumptions used in the calculations performed by Witness Taylor are consistent with the calculations supporting LaRoche Exhibit 4. Importantly, there remains a great deal of uncertainty regarding the estimates and impacts associated with the IRA tax benefits, and the Company is requesting to defer any over/under recoveries not reflected in rates.

Q. PLEASE FURTHER DESCRIBE LAROCHE EXHIBIT 4.

A. LaRoche Exhibit 4 provides a summary of the PVRR for the various tax credit scenarios likely for the 2026 Solar Investment. This analysis helped DEC examine the overall potential benefits that might result under each scenario.

Q. WHY DID DEC ASSUME THE SELECTION OF THE PTC OPTION?

A. LaRoche Exhibit 4 provides a summary of the PVRR for the various tax credit scenarios likely for the 2026 Solar Investment. The PTC scenarios (scenarios 1 and 2) have the lowest revenue requirements, thus present the most value to customers as compared to the scenarios utilizing the ITC (scenarios 3, 4, and 5). Note that the analysis provided in LaRoche Exhibit 4 assumes that prevailing wage and apprenticeship standards are met. It is also important to note that selection of the PTC or ITC must be based on the relevant facts and circumstances of each project.

Q. HOW DID THE COMPANY DEVELOP THE COSTS ASSOCIATED WITH THE 2026 SOLAR INVESTMENT?

A. DEC developed the 2026 Solar Investment cost estimates using the same methodology and approach employed in the Carbon Plan proceeding. There, the Companies relied on capital cost estimates developed by a third-party consultant, Guidehouse. Guidehouse is a leading global provider of consulting services to the public and commercial markets with broad capabilities in management, technology, and risk consulting. Guidehouse provides forward-looking capital cost estimates based on market report information on recent utility-scale solar deployments in the United States. This market information includes pricing data from tier-one solar panel manufacturers, assumptions on system size, design, and geographic location. Guidehouse provides cost estimate forecasts on a semi-annual basis and the Companies used the Fall 2021 forecast to develop Carbon Plan cost estimates. The Companies benchmarked the Guidehouse cost forecasts against other industry sources such as National Renewable Energy Laboratory, U.S. Energy Information Administration, Lawrence Berkley National Laboratory, and Electric Power Research Institute for reasonableness. In addition, the Companies supplemented the Guidehouse data with historical estimates for interconnection costs, owner costs, and network upgrade costs to the Guidehouse numbers based on historical information. LaRoche Exhibit 3 provides the cost breakdown for the 2026 Solar Investment. The cost estimate is consistent with the fixed charge rate workbook provided in E-100, Sub 179.

Q. ARE THE COST PROJECTIONS FOR EQUIPMENT, ENGINEERING, AND CONSTRUCTION OF THE PROPOSED 2026 SOLAR INVESTMENT PRUDENT AND REASONABLE?

A. Yes. The cost estimation approach employed for modeling costs associated with the 2026 Solar Investment align with those employed in the Carbon Plan proceeding.

III. DEPRECIABLE LIFE FOR SOLAR FACILITIES

Q. WHAT DEPRECIABLE LIFE WILL THE COMPANY UTILIZE FOR SOLAR MYRP PROJECTS?

A. DEC seeks to utilize a 35-year life for solar projects that are part of DEC's MYRP. Consistent with Commission Rule R1-17B(d)(2)j(iv), Witness Taylor Exhibit 2 includes a 35-year depreciable life for projects included in the 2026 Solar Investment that are a part of DEC's MYRP.

Q. WHY IS THE COMPANY PROPOSING A 35-YEAR DEPRECIABLE LIFE FOR MYRP SOLAR ASSETS?

A. The 35-year expected life is consistent with the Company's current design, procurement, and operational outlook for future solar facilities. DEC's revised design criteria for new solar facilities specify a 35-year overall life expectancy. The Company's operational experience and planned O&M practices for these new facilities are intended to support the 35-year life.

Q. HOW DOES THE 35-YEAR DEPRECIABLE LIFE DESIGN CRITERIA SUPPORT THE COMPANY'S REQUEST?

A. DEC will construct new solar facilities consistent with the revised specifications. For example, DEC will design major equipment like racking systems and cabling to provide for the 35-year life expectancy.

Q. DO DEC'S PROJECTED COSTS INCLUDE CONTINGENCY?

A. Yes. Contingency is an essential component of a comprehensive and transparent cost estimate. As such, an industry standard assumption of 4% is included in DEC'S cost estimates.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

Line No.	MYRP Project Name	FERC Function	Project Forecasted In-	MYRP Project Description & Scope	Reason for the MYRP Project	Total Project Amount (System) Projected In-Service Costs	Projected Annual Net	Projected Installation O&M
1	2026 Solar Investment	Other Production Plant in Service	6/1/2026	Procurement of 165 MWs achieving in-service June 1, 2026	Meets new solar generation resources established in IRP, encourages carbon reduction through utility scale solar energy, and supports the solar procurements targets established for the 2022 Solar Procurement RFP	$ 246,015,587	$1,151,843.39	$ -
	TOTALS					**$ 246,015,587**	**$ 1,151,843**	**$ -**

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1276
LaRoche Exhibit 2
CONFIDENTIAL - Redacted

Below is a map showing the approximate locations of all utility track bids submitted into the 2022 Solar Procurement Request for Proposals ("RFP").

2022 Solar Procurement Program Bid Evaluation and Selection Process:

As outlined in the 2022 Solar Procurement Program RFP, DEC will evaluate each bid and rank bids based on a combination of economic and non-economic criteria. The RFP defines the criteria and guidance for each aspect of the evaluation process, i.e., economic and non-economic, including the scoring sheet that will be used to facilitate the evaluations.

Non-economic scoring criteria includes: facility permitting, financing experience, technical development and operational experience, historically underutilized businesses, development risks, technology risks, and social objectives and environmental factors. Economic scoring and evaluation is based on calculating each bid's levelized cost of energy over a 30-year analysis period on a dollar per megawatt hour basis.

Duke Energy Carolinas, LLC
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LaRoche Exhibit 3
Confidential - Redacted

Cost Estimate

Project Name:	2026 Solar Investment
MW(ac):	165.0
MW(dc):	231.0

a. Cost Breakdown	Estimate	Guidehouse %	b. Description
PV Modules*	[redacted]	[redacted]	PV modules.
Inverters*			Inverters.
Electrical BOS*			Electrical Balance of System.
Structural BOS*			Structural (racking, assumes fixed tilt) Balance of System.
Tracking Adder*			Adder for tracker racking system.
Direct Labor*			Install labor.
Engineering and PII*			Engineering.
Supply Chain, OH, EPC Margin*			Supply Chain, overhead and EPC margin.
Owners Cost*			Owner's costs including: construction oversight, engineering reviews, development, etc.
Interconnection*			Interconnection costs.
Contingency			Contingency.
AFUDC			AFUDC.
Total Project Cost Estimate	**$ 246,015,587**		

Notes:
[redacted]

Duke Energy Carolinas, LLC
Docket No. E-7, Sub 1276
LaRoche Exhibit 4
Confidential

Present Value Revenue Requirement ("PVRR") Scenario Comparison		
		($000s)
Scenario	Normalize ITC / PTC	2026 Solar Investment
1) PTC Transfer	[redacted]	
2) PTC Usage in 2031		
3) ITC Transfer		
4) ITC Usage in 2031		
5) ITC Transfer		

The comparison table above provides and summarizes the present value of revenue requirements ("PVRR") under various PTC and ITC scenarios. The third column lists the PVRR values and represents the present value of the funds that need to be collected from customers (to recover the investment and operating expenses). Tax credits (i.e. the PTC or ITC) are used to offset or lower the revenue requirements to customers. When comparing the PVRRs for each scenario, the two PTC scenarios (#1 and #2) yield the lowest PVRRs, thus demonstrating that the PTC would be preferred over the ITC and provides the most value for DEC customers.

Note: There is still uncertainty around various assumptions in this analysis. DEC will continue evaluating PTC vs ITC options as more information is available.

All scenarios assume the base tax credit and prevailing wage and apprenticeship standards are met; however, each scenario excludes domestic content and energy community bonuses.