Report on the NCTPC 2023–2033 Collaborative Transmission Plan

January 19, 2024
FINAL DRAFT REPORT

2023 – 2033 NCTPC Transmission Plan
Table of Contents

I. Executive Summary

The North Carolina Transmission Planning Collaborative ("NCTPC") was established to:

1) provide the Participants (Duke Energy Carolinas ("DEC"), Duke Energy Progress ("DEP"), North Carolina Electric Membership Corporation ("NCEMC"), and ElectriCities of North Carolina ("ElectriCities") and other stakeholders an opportunity to participate in the electric transmission planning process for the areas of North Carolina and South Carolina served by the Participants;

2) preserve the integrity of the current reliability and least-cost planning processes;

3) expand the transmission planning process to include analysis of increasing transmission access to supply resources inside and outside the Balancing Authority Areas ("BAAs") of DEC and DEP; and

4) develop a single coordinated transmission plan for the Participants that includes reliability, economic, and public policy considerations while appropriately balancing costs, benefits and risks associated with the use of transmission and generation resources.

Attachment N-1 of the Joint Open Access Transmission Tariff of DEC, DEP, and Duke Energy Florida LLC ("Joint OATT")[1] reflects the Local Transmission Planning Process for DEC and DEP approved by the FERC for compliance with Order Nos. 890 and 1000 and is effectuated through the NCTPC Process. The overall NCTPC Process is performed annually and includes the Reliability Planning Process and may also include the Local Economic Planning Study and Local Public Policy processes, all of which are intended to be concurrent and iterative in nature. The NCTPC Process is designed such that there will be considerable feedback and

[1] Joint Open Access Tariff of Duke Energy Carolinas, LLC, Duke Energy Florida, LLC, and Duke Energy Progress, LLC, at 1084, available at http://www.ferc.duke-energy.com/Tariffs/Joint_OATT.pdf.

iteration between these processes as each effort's solution alternatives affect the other's solutions.

The 2022–2032 Collaborative Transmission Plan (the "2022 Collaborative Transmission Plan" or the "2022 Plan") was published in February 2023. That plan received a mid-year update in July 2023.

This report documents the current 2023 – 2033 Collaborative Transmission Plan ("2023 Collaborative Transmission Plan" or the "2023 Plan") for the Participants. The initial sections of this report provide an overview of the NCTPC Process as well as the specifics of the 2023 reliability planning study scope and methodology. The NCTPC Process document and 2023 Study scope document are posted in their entirety on the NCTPC website at http://www.nctpc.org/nctpc/.

The scope of the 2023 reliability planning process is focused on the annual base reliability study. The base reliability study assesses the reliability of the transmission systems of both DEC and DEP in order to ensure reliability of service in accordance with North American Electric Reliability Corporation ("NERC"), SERC Reliability Corporation ("SERC"), and DEC and DEP requirements. The purpose of the base reliability study is to evaluate the transmission systems' ability to meet load growth projected for 2023 through 2033 with the Participants' planned Designated Network Resources ("DNRs").

Based on the reliability study's input assumptions, the 2023 Study identifies any new system impacts not currently addressed by existing transmission plans, in which case solutions were developed. The 2023 Study also adjusts existing plans where necessary.

The 2023 Plan is detailed in Appendix C which identifies the new and updated projects. The total estimated cost for the 58 reliability projects included in the 2023 Plan is $1.937 billion. This compares to the original 2022 Plan estimate of $936 million for 24 base reliability projects. In-service dates and cost estimates for some projects that are planned or underway have been revised based on updated information. An update to the 2022 Plan was provided in the 2022 Mid-Year Update published in July 2023 with an updated cost estimate for base reliability projects of $897 million. See Appendix G for a detailed comparison of this year's Plan to the updated 2022 Plan.

The list of major projects will continue to be modified on an ongoing basis as new improvements are identified through the NCTPC Process and projects are placed in-service or eliminated from the list. Appendix D provides a more detailed description of each reliability project in the 2023 Plan.

There are 15 approved Public Policy projects listed in the 2023 Plan. They are listed in Appendix E with detailed project descriptions in Appendix F. The total estimated cost for the 15 Public Policy projects is $503 million.

The total for all the projects included in the 2023 Transmission Plan is $2.440 billion.

For the purposes of this report the following definitions are used:

- Construct – greenfield project that is new
- Reconductor – existing structures will support new conductor and attachments
- Rebuild – new structures required
- Upgrade – generic – may include upgraded structures, upgraded conductor, upgraded relay protection, upgraded attachments, upgraded CTs, line traps, etc.
- Conversion – the operating voltage of a line will change, generally increasing
- Network – modify interconnection of transmission elements that were previously radially connected to place them in series with the transmission network
- Replace – a piece of equipment has failed or is near end of life, has failed, or needs to be changed to achieve greater capacity and new, similar equipment needs to be installed

The 2023 Plan, relative to the 2022 Plan, includes 12 new reliability projects for DEP and 24 new DEC reliability projects:

Project ID	**Project Name**
0086	Parkwood Tie 500/230 kV Bank 5, Replace
0087	Breaker Station on Motley 100 kV Line for New Customer, Construct

Project ID	Project Name
0088	Island Creek 44 kV, Conversion
0089	McDowell Tie 230/100 kV Bank 2, Replace
0090	Boyd Switching Station, Construct
0091	Haas Creek Switching Station, Construct
0092	Lyle Creek Switching Station, Construct
0093	Page and Guilford 100 kV Lines (Greensboro-North Greensboro), Upgrade
0094	Cabarrus 100 kV Line (Wildcat-Westfork), Upgrade
0095	Sevier 100 kV Line (East Greenville-Verdae Retail Tap), Upgrade
0096	Panther 100 kV Line (EMC Corp-Stallings Rd Retail), Network
0097	Dan River 100 kV Line (Dan River-North Greensboro), Upgrade
0098	Oliver 230 kV Line (Marshall-Boyd), Upgrade
0099	Reidsville and Wolf Creek 100 kV Lines (Dan River-Sadler), Upgrade
0100	Beulah 100 kV Line (Lookout-EnergyUnited Del 18), Upgrade
0101	Hinkle 100 kV Line (Stamey-Statesville), Upgrade
0102	Concord 100 kV Line (Concord-Concord City Del 3), Upgrade
0103	Crab Orchard 100 kV Line (Harrisburg-Amity), Upgrade
0104	Hands Mill Switching Station, Construct
0105	Kennedy 100 kV Line (Orchard-Newton Tap), Upgrade
0107	Buckhorn 44 kV Line, Conversion
0108	Messer 230 kV Line (Dixon School Rd-Customer), Construct
0109	Terrell 44 kV Line, Conversion
0110	Troutman 44 kV Line, Conversion
0115	Havelock 230/115 kV Banks 1 & 2, Replace
0116	Rocky Mount – Battleboro 115 kV Line, Reconductor
0117	Asheville Plant – Oteen 115 kV West Line (Arden), Construct
0118	Weatherspoon – LOF 115 kV Line (Weatherspoon-LREMC West Lumberton), Reconductor
0119	Weatherspoon – LOF 115 kV Line (Maxton-Pembroke), Reconductor
0120	Sumter – SCEG Eastover 115 kV Line (Kings Hwy – Shaw Field – Eastover), Reconductor
0121	Brush Creek 230 kV, Construct STATCOM
0122	Asheboro – Siler City 115 kV Line, Reconductor

Project ID	Project Name
0123	Falls – Franklinton (Franklinton – Franklinton Novo 115 kV Feeder), Construct
0124	Castle Hayne-Folkstone 230 kV Line - Porters Neck 230 kV Tap Line, Construct
0125	Method – Milburnie 115 kV North Line, Reconductor
0126	Rockingham - West End 230 kV West Line, Reconductor

There are revised in-service dates, estimated cost changes, and/or scope changes for the following DEC and DEP reliability and RZEP projects in the 2023 Plan relative to the 2022 Plan and associated Mid-Year Update:

Project ID	Project Name	Cost Change	Timeline Change
0024	Durham – RTP 230 kV Line, Reconductor	▬	⟪
0039	Asheboro–Asheboro East 115 kV North Line, Reconductor	▬	▬
0046	Windmere 100 kV Line (Dan River–Sadler), Construct	↑	⟫
0048	Wilkes 230/100 kV Tie Station, Construct	↑	⟫
0050	Craggy–Enka 230 kV Line, Construct	↓	▬
0051	Cokesbury 100 kV Line (Coronaca–Hodges), Upgrade	↑	▬
0052	South Point 100 kV Switching Station, Construct	↓	▬
0053	Wateree Hydro Plant, Upgrade	▬	▬
0054	Carthage 230/115 kV Substation, Construct	↑	⟫
0056	Castle Hayne–Folkstone 115 kV Line, Rebuild	↑	⟫
0057	Holly Ridge North 115 kV Switching Station, Construct	▬	▬
0058	Coronaca 100 kV Line (Coronaca-Creto), Upgrade and Construct	↑	⟪
0059	Monroe 100 kV Line (Lancaster-Monroe), Upgrade	↓	▬
0060	Westport 230 kV Line (McGuire-Marshall), Upgrade	↓	▬
0061	Wateree 100 kV Line (Great Falls-Wateree), Upgrade	↑	▬

Project ID	Project Name	Cost Change	Timeline Change
0062	Silas 100 kV Line (Mocksville-Idols Tap), Upgrade	↑	⟪
0063	North Greenville 230 kV Tie Station, Upgrade	↑	—
0064	Wylie 100 kV Line (Wylie-Arrowood Retail), Upgrade	↑	—
0065	Morning Star 230 kV Tie Station, Upgrade	↑	—
0066	Davidson River 100 kV Line (North Greenville-Marietta), Upgrade	↓	—
0067	Harley 100 kV Line (Tiger-Campobello), Upgrade	—	—
0068	Sandy Ridge 230 kV Line (Newport-Morning Star), Upgrade	↓	—
0069	Skybrook 100 kV Line (Winecoff-Eastfield Retail), Upgrade	↓	—
0070	Cape Fear – West End 230 kV Line, Rebuild	↓	—
0071	Erwin – Fayetteville East 230 kV Line, Rebuild	↓	—
0072	Erwin – Fayetteville 115 kV Line, Rebuild	↓	—
0073	Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild	↓	—
0074	Milburnie 230 kV Substation, Upgrade	—	—
0075	Weatherspoon-Marion 115 kV Line, Rebuild	—	—
0076	Camden Junction-Wateree 115 kV Line, Rebuild	—	—
0077	Robinson Plant-Rockingham 115 kV Line, Rebuild	—	—
0078	Robinson Plant-Rockingham 230 kV Line, Rebuild	↑	—
0079	Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild	—	—
0080	Lee 100 kV Line (Lee-Shady Grove), Upgrade	↓	—

Project ID	Project Name	Cost Change	Timeline Change
0081	Piedmont 100 kV Line (Lee-Shady Grove), Upgrade	↓	—
0082	Newberry 115 kV Line (Bush River-DESC), Upgrade	↓	⟪
0083	Clinton 100 kV Line (Bush River-Laurens), Upgrade	↓	—
0085	Camden – Camden Dupont 115 kV Line, Reconductor	↑	—

Each year, the Oversight Steering Committee ("OSC") of the NCTPC determines if there are any public policies driving the need for local transmission upgrades. Through this process, the OSC requests input from the Transmission Advisory Group ("TAG") participants to identify any Public Policy impacts to be evaluated as part of the NCTPC Local Planning Process. The OSC itself may identify public policies to be evaluated.

For the 2023 Study, the NCTPC received two Public Policy Study requests: (1) the interconnection of high volumes of solar and solar plus storage to the DEC and DEP transmission systems; and (2) the generation retirements and resource supply additions as provided in the 2022 Duke Carbon Plan Portfolios. The final scope of the 2023 Public Policy Study assumed a combination of scenarios from these two requests, incorporating input from the OSC and in consultation and coordination with the two study requestors. The Public Policy Study analysis is still in progress. The results of the 2023 Public Policy Study will be published in a supplemental report at a later date, anticipated to be Q1 2024.

The 2023 Plan includes 1 new DEP project resulting from the Local Public Policy Planning Process:

Project ID	Project Name
0085	Camden – Camden Dupont 115 kV Line, Reconductor

This RZEP project is needed in order to interconnect at the fast pace and large volume of new renewables specified in the Carbon Plan. Consistent with Section 4.3.2.1 of Section N-1 of the OATT, the criteria for determining whether a public

policy drives local transmission need includes a requirement that the "public policy must be reflected in state, federal or local law or regulation (including order of a state, federal, or local agency)." Enactment of the North Carolina General Assembly law HB 951 and the subsequent NCUC Carbon Plan Order provides support for this RZEP project being included as public policy projects in the Local Transmission Plan. Inclusion of this RZEP project in the 2023 Plan should not be viewed as an indication of any NCTPC OSC member's position on cost recovery or support for any specific cost allocation approach. Inclusion of the 15 RZEP projects as public policy projects should not be viewed as limiting the consideration of other benefits in cost recovery or cost allocation. Each LSE reserves the right to continue to advocate that the allocation of costs is done in a fair and equitable manner, and to ensure that only reasonable costs are eligible for recovery.

Appendix F provides a more detailed description of each project in the 2023 Plan to integrate additional generation and proposed for compliance with Public Policy.

For a variety of reasons (such as load growth, generation retirements, or power purchase agreements expiring), LSEs may wish to evaluate other resource supply options to meet future load demand as part of the Local Economic Study Process. These resource supply options can be either in the form of transactions or some hypothetical generators which are added to meet the resource adequacy requirements for this study.

In this 2023 NCTPC Process, the Participants validated and continued to build on the information learned from previous years' efforts. Each year the Participants will look for ways to improve and enhance the planning process. The study process confirmed again this year that the joint planning approach produces benefits for all Participants that would not have been realized without a collaborative effort.

II. North Carolina Transmission Planning Collaborative Process

II.A. Overview of the Process

The NCTPC Process was established by the Participants to:

1) provide the Participants (DEC, DEP, NCEMC, and ElectriCities) and other stakeholders an opportunity to participate in the electric transmission planning process for the areas of North Carolina and South Carolina served by the Participants;

2) preserve the integrity of the current reliability and least-cost planning processes;

3) expand the transmission planning process to include analysis of increasing transmission access to supply resources inside and outside the Balancing Authority Areas of DEC and DEP; and

4) develop a single coordinated transmission plan for the Participants that includes reliability, economic, and public policy considerations while appropriately balancing costs, benefits, and risks associated with the use of transmission and generation resources.

The NCTPC Process is a coordinated Local Transmission Planning process conducted on an annual basis. The Local Transmission Plan will identify local transmission projects (Local Projects). A Local Project is defined as a transmission facility that is (1) located solely within the combined DEC–DEP transmission system footprint and (2) not selected in the regional transmission plan for purposes of regional cost allocation.

The Local Planning Process addresses transmission upgrades needed to maintain reliability and to integrate new generation resources and/or loads. The overall Local Planning Process includes several components:

- Reliability Planning Process
- Local Economic Study Process
- Local Public Policy Process

An overview of the NCTPC Process Flow is included in Appendix A.

The Reliability Planning Process (base reliability study) evaluates each Transmission System's ability to meet projected load with a defined set of resources as well as the needs of firm point-to-point customers, whose needs are reflected in their transmission contracts and reservations.

The Local Economic Study Process allows the TAG participants to propose economic upgrades to be studied as part of the Local Planning Process. This process evaluates the means to increase transmission access to potential supply resources inside and outside the Balancing Authority Areas of DEC and DEP.

The Local Public Policy Process identifies if there are any public policies that are driving the need for local projects. Either the OSC or the TAG could identify those public policies that may drive the need for new local transmission projects.

The OSC manages the NCTPC Process. The Planning Working Group (“PWG”) implements the development of the NCTPC Process and coordinates the study development. The TAG provides advice and makes recommendations regarding the development of the NCTPC Process and the study results, and may propose transmission solutions, generation solutions, and solutions utilizing demand resources.

The final results of the Local Planning Process include summaries of the estimated costs and schedules to provide any transmission upgrades and/or additions needed to maintain a sufficient level of reliability necessary to serve customers.

II.B. Reliability Planning Process

The Reliability Planning Process had traditionally been used by the transmission owners to provide safe and reliable transmission service at the lowest reasonable cost. Through the NCTPC, this process was expanded to include the active participation of the Participants and input from other stakeholders through the TAG.

The OSC approves the scope of the reliability study, oversees the study analysis being performed by the PWG, evaluates the study results, and approves the final reliability study results. The Reliability Planning Process begins with the incumbent transmission owners' most recent reliability planning studies and planned transmission upgrade projects.

The PWG coordinates the development of the reliability study based upon the OSC approved scope and prepares a report with the recommended transmission reliability solutions.

The results of the Reliability Planning Process include summaries of the estimated costs and schedules to provide transmission upgrades and/or additions needed to: (i) maintain a sufficient level of reliability necessary to serve the native load of all Participants and (ii) reliably support the resources studied. The reliability study results are reviewed with the TAG, and the TAG participants are given an opportunity to provide comments on the results. All TAG feedback is reviewed by the OSC and PWG for consideration for incorporation into the final Collaborative Transmission Plan.

II.C. Local Economic Study Process

The Local Economic Study Process allows the TAG participants to propose hypothetical economic transfers to be studied as part of the Local Planning Process. The Local Economic Study Process provides the means to evaluate the impact of potential supply resources inside and outside the BAAs of the Transmission Providers. This local economic analysis provides the opportunity to study what transmission upgrades would be required to reliably integrate new resources.

The Local Economic Study Process begins with the TAG members proposing scenarios and interfaces to be studied, which are then compiled by the PWG and evaluated by the OSC to determine which ones will be included for analysis in the current planning cycle.

The OSC approves the scope of the Local Economic Study scenarios (including any changes in the assumptions and study from those used in the reliability analysis), oversees the study analysis being coordinated by the PWG, evaluates the study results, and approves the final Local Economic Study results.

The PWG coordinates the development of the Local Economic Studies based upon the OSC approved scope and prepares a report which identifies recommended transmission solutions that could increase transmission access.

The results of the Local Economic Study Process include the estimated costs and schedules to provide the increased transmission capabilities. The Local Economic Study results are reviewed with the TAG, and the TAG participants are given an opportunity to provide comments on the results. All TAG feedback is reviewed by the OSC for consideration for incorporation into the final Local Transmission Plan.

Some planning cycles may only focus on the Reliability Planning Process if stakeholders do not request any economic study scenarios for a particular planning cycle.

For the 2023 Study, the NCTPC did not receive any requests to study any Local Economic Study scenarios by the deadline of February 8, 2023. Local Economic Study scenarios will be solicited again for the 2024 Study and included if appropriate.

II.D. Local Public Policy Process

Each year, the OSC seeks input from the TAG participants to determine if there are any public policies driving the need for local transmission upgrades to be evaluated as part of the Local Planning Process. The OSC may itself identify public policies to be evaluated. The OSC will

use the criteria below:

- The Public Policy must be reflected in state, federal, or local law or regulation (including order of a state, federal, or local agency).
- There must be existence of facts showing that the identified need cannot be met absent the construction of additional transmission facilities.

For the 2023 Study, the NCTPC received two Public Policy Study requests: (1) the interconnection of high volumes of solar and solar plus storage to the DEC and DEP transmission systems; and (2) the generation retirements and resource supply additions as provided in the 2022 Duke Carbon Plan Portfolios. The final scope of the 2023 Public Policy Study assumed a combination of scenarios from these two requests, incorporating input from the NCTPC/OSC and in consultation and coordination with the two study requestors. The Public Policy Study analysis is still in progress. The results of the 2023 Public Policy Study will be published in a supplemental report at a later date, anticipated to be Q1 2024.

II.E. Local Transmission Plan

Once the reliability study is complete, including any requested local economic or public policy study results, the OSC evaluates the results and any PWG recommendations to determine if any proposed economic projects or public policy projects will be incorporated into the Local Transmission Plan. If so, the initial plan developed based on the results of the reliability studies is modified accordingly. This process results in a single Local Transmission Plan that appropriately balances the costs, benefits and risks associated with the use of transmission and generation resources. This plan is reviewed with the TAG, and the TAG participants are given an opportunity to provide comments. All TAG participant feedback is reviewed by the OSC for consideration to be incorporated into the final Local Transmission Plan.

III. 2023 Reliability Planning Study Scope and Methodology

The scope of the 2023 Reliability Planning Process is focused on the annual base reliability study. The base reliability study assessed the transmission systems of both DEC and DEP in order to ensure reliability of service in accordance with North American Electric Reliability Corporation ("NERC"), SERC Reliability Corporation ("SERC"), and DEC and DEP requirements. The purpose of the base reliability study is to evaluate the transmission systems' ability to meet load growth projected for 2028 summer through 2033/2034 winter with the Participants' DNRs. The 2023 Study identifies any new system impacts not currently addressed by existing transmission plans in which case solutions were developed. The 2023 Study also allows for adjustments to existing plans where necessary.

III.A. Assumptions

1. Study Year and Planning Horizon

The 2023 Plan addressed a ten-year planning horizon through 2033. The study years and seasons chosen for the 2023 Study are listed in Table 1.

Table 1
Study Years

Study Year / Season	Analysis
2028 Summer	Near-term base reliability
2028/2029 Winter	Near-term base reliability
2033 Summer	Long-term base reliability
2033/2034 Winter	Long-term base reliability

2. Network Modeling

The network models developed for the 2023 Study included new transmission facilities and upgrades for the four study models, as appropriate, from the current transmission plans of DEC and DEP, and from the 2022 Plan. Table 2 lists the planned major transmission facility projects included in the models. Tables 3 and 4 list the major generation facility additions and retirements included in the models.

Table 2

Major Transmission Facility Projects Included in Models

Company	Project ID	Project Name	2028S	2028/ 2029W	2033S	2033/ 2034W
DEC	0046	Windmere 100 kV Line (Dan River-Sadler), Construct	Yes	Yes	Yes	Yes
DEC	0048	Wilkes 230/100 kV Tie Station, Construct	Yes	Yes	Yes	Yes
DEC	0051	Cokesbury 100 kV Line (Coronaca-Hodges), Upgrade	Yes	Yes	Yes	Yes
DEC	0052	South Point 100 kV Switching Station, Construct	Yes	Yes	Yes	Yes
DEC	0058	Coronaca 100 kV Line (Coronaca-Creto), Upgrade and Construct	Yes	Yes	Yes	Yes
DEC	0059	Monroe 100 kV Line (Lancaster-Monroe), Upgrade	Yes	Yes	Yes	Yes
DEC	0060	Westport 230 kV Line (McGuire-Marshall), Upgrade	No	No	No	No
DEC	0061	Wateree 100 kV Line (Great Falls-Wateree), Upgrade	Yes	Yes	Yes	Yes
DEC	0062	Silas 100 kV Line (Mocksville-Idols Tap), Upgrade	Yes	Yes	Yes	Yes
DEC	0063	North Greenville 230 kV Tie Station, Upgrade	Yes	Yes	Yes	Yes

Company	Project ID	Project Name	2028S	2028/ 2029W	2033S	2033/ 2034W
DEC	0064	Wylie 100 kV Line (Wylie-Arrowood Retail), Upgrade	Yes	Yes	Yes	Yes
DEC	0065	Morning Star 230 kV Tie Station, Upgrade	No	No	Yes	Yes
DEC	0066	Davidson River 100 kV Line (North Greenville-Marietta), Upgrade	No	No	Yes	Yes
DEC	0067	Harley 100 kV Line (Tiger-Campobello), Upgrade	No	No	No	No
DEC	0068	Sandy Ridge 230 kV Line (Newport-Morning Star), Upgrade	No	No	No	No
DEC	0069	Skybrook 100 kV Line (Winecoff-Eastfield Retail), Upgrade	No	No	No	No
DEC	0080	Lee 100 kV Line (Lee-Shady Grove), Upgrade*	Yes	Yes	Yes	Yes
DEC	0081	Piedmont 100 kV Line (Lee-Shady Grove), Upgrade*	Yes	Yes	Yes	Yes
DEC	0082	Newberry 115 kV Line (Bush River-DESC), Upgrade*	Yes	Yes	Yes	Yes
DEC	0083	Clinton 100 kV Line (Bush River-Laurens), Upgrade*	Yes	Yes	Yes	Yes
DEC	0086	Parkwood Tie 500/230 kV Bank 5, Replace	Yes	Yes	Yes	Yes

Company	Project ID	Project Name	2028S	2028/ 2029W	2033S	2033/ 2034W
DEC	0087	Breaker Station on Motley 100 kV Line for New Customer, Construct	Yes	Yes	Yes	Yes
DEC	0088	Island Creek 44 kV, Conversion	Yes	Yes	Yes	Yes
DEC	0089	McDowell Tie 230/100 kV Bank 2, Replace	No	No	No	No
DEC	0090	Boyd Switching Station, Construct	Yes	Yes	Yes	Yes
DEC	0091	Haas Creek Switching Station, Construct	Yes	Yes	Yes	Yes
DEC	0092	Lyle Creek Switching Station, Construct	Yes	Yes	Yes	Yes
DEC	0093	Page and Guilford 100 kV Lines (Greensboro-North Greensboro), Upgrade	Yes	Yes	Yes	Yes
DEC	0094	Cabarrus 100 kV Line (Wildcat-Westfork), Upgrade	No	No	No	No
DEC	0095	Sevier 100 kV Line (East Greenville-Verdae Retail Tap), Upgrade	Yes	Yes	Yes	Yes
DEC	0096	Panther 100 kV Line (EMC Corp-Stallings Rd Retail), Network	No	No	Yes	Yes
DEC	0097	Dan River 100 kV Line (Dan River-North Greensboro), Upgrade	No	No	Yes	Yes
DEC	0098	Oliver 230 kV Line (Marshall-Boyd), Upgrade	No	No	Yes	Yes

Company	Project ID	Project Name	2028S	2028/ 2029W	2033S	2033/ 2034W
DEC	0099	Reidsville and Wolf Creek 100 kV Lines (Dan River-Sadler), Upgrade	No	No	Yes	Yes
DEC	0100	Beulah 100 kV Line (Lookout-EnergyUnited Del 18), Upgrade	No	No	No	No
DEC	0101	Hinkle 100 kV Line (Stamey-Statesville), Upgrade	No	No	No	No
DEC	0102	Concord 100 kV Line (Concord-Concord City Del 3), Upgrade	No	No	No	No
DEC	0103	Crab Orchard 100 kV Line (Harrisburg-Amity), Upgrade	No	No	No	No
DEC	0104	Hands Mill Switching Station, Construct	Yes	Yes	Yes	Yes
DEC	0105	Kennedy 100 kV Line (Orchard-Newton Tap), Upgrade	Yes	Yes	Yes	Yes
DEC	0107	Buckhorn 44 kV Line, Conversion	Yes	Yes	Yes	Yes
DEC	0108	Messer 230 kV Line (Dixon School Rd-Customer), Construct	No	No	No	No
DEC	0109	Terrell 44 kV Line, Conversion	Yes	Yes	Yes	Yes
DEC	0110	Troutman 44 kV Line, Conversion	Yes	Yes	Yes	Yes
DEP	0024	Durham – RTP 230 kV Line, Reconductor	No	No	No	No

Company	Project ID	Project Name	2028S	2028/ 2029W	2033S	2033/ 2034W
DEP	0039	Asheboro – Asheboro East 115 kV North Line, Reconductor	Yes	Yes	Yes	Yes
DEP	0050	Craggy – Enka 230 kV Line, Construct	Yes	Yes	Yes	Yes
DEP	0053	Wateree Hydro Plant, Upgrade	Yes	Yes	Yes	Yes
DEP	0054	Carthage 230/115 kV Substation, Construct	No	No	No	No
DEP	0056	Castle Hayne – Folkstone 115 kV Line, Rebuild	No	No	No	No
DEP	0057	Holly Ridge North 115 kV Switching Station, Construct	No	No	No	No
DEP	0070	Cape Fear – West End 230 kV Line, Rebuild*	Yes	Yes	Yes	Yes
DEP	0071	Erwin – Fayetteville East 230 kV Line, Rebuild*	Yes	Yes	Yes	Yes
DEP	0072	Erwin – Fayetteville 115 kV Line, Rebuild*	Yes	Yes	Yes	Yes
DEP	0073	Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild*	Yes	Yes	Yes	Yes
DEP	0074	Milburnie 230 kV Substation, Upgrade*	Yes	Yes	Yes	Yes
DEP	0075	Weatherspoon – Marion 115 kV Line, Upgrade*	Yes	Yes	Yes	Yes

Company	Project ID	Project Name	2028S	2028/ 2029W	2033S	2033/ 2034W
DEP	0076	Camden Junction – Wateree 115 kV Line, Rebuild*	Yes	Yes	Yes	Yes
DEP	0077	Robinson Plant – Rockingham 115 kV Line, Rebuild*	Yes	Yes	Yes	Yes
DEP	0078	Robinson Plant – Rockingham 230 kV Line, Upgrade*	Yes	Yes	Yes	Yes
DEP	0079	Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild*	Yes	Yes	Yes	Yes
DEP	0085	Camden – Camden Dupont 115 kV Line, Reconductor^	Yes	Yes	Yes	Yes
DEP	0115	Havelock 230/115 kV Banks 1 & 2, Replace	No	No	No	No
DEP	0116	Rocky Mount – Battleboro 115 kV Line, Reconductor	No	No	No	No
DEP	0117	Asheville Plant – Oteen 115 kV West Line (Arden), Construct	No	No	No	No
DEP	0118	Weatherspoon – LOF 115 kV Line (Weatherspoon-LREMC West Lumberton), Reconductor	No	No	No	No
DEP	0119	Weatherspoon – LOF 115 kV Line, (Maxton-Pembroke) Reconductor	No	No	No	No
DEP	0120	Sumter – SCEG Eastover 115 kV Line, (Kings Hwy – Shaw Field – Eastover), Reconductor	No	No	No	No

Company	Project ID	Project Name	2028S	2028/ 2029W	2033S	2033/ 2034W
DEP	0121	Brush Creek 230 kV, Construct STATCOM	No	No	No	No
DEP	0122	Asheboro – Siler City 115 kV Line, Reconductor	No	No	No	No
DEP	0123	Falls – Franklinton (Franklinton – Franklinton Novo 115 kV Feeder), Construct	No	No	No	No
DEP	0124	Castle Hayne-Folkstone 230 kV Line - Porters Neck 230 kV Tap Line, Construct	Yes	Yes	Yes	Yes

*** 2022 Public Policy Project from RZEP Carbon Plan Upgrades**

^ 2023 Public Policy Project from RZEP Carbon Plan Upgrades

Table 3

Major Generation[2] Facility Additions in Models

Company	Generation Facility	2028S	2028/ 2029W	2033S	2033/ 2034W
DEC	Lincoln County CT (525 MW)	Included	Included	Included	Included
DEC	Apex PV (30 MW)	Included	Included	Included	Included
DEC	Aquadale PV (50 MW)	Included	Included	Included	Included
DEC	Bear Branch PV (35 MW)	Included	Included	Included	Included
DEC	Beaverdam PV (42 MW)	Included	Included	Included	Included
DEC	Blackburn PV (61.7 MW)	Included	Included	Included	Included
DEC	Brookcliff PV (50 MW)	Included	Included	Included	Included
DEC	Healing Springs PV (55 MW)	Included	Included	Included	Included
DEC	Hornet PV (75 MW)	Included	Included	Included	Included
DEC	Hunters Cove PV (50 MW)	Included	Included	Included	Included
DEC	Misenheimer PV (74.4 MW)	Included	Included	Included	Included

[2] Major Generation Threshold is 10 MW or greater and connected to the transmission system

Company	Generation Facility	2028S	2028/ 2029W	2033S	2033/ 2034W
DEC	Newberry PV (74.5 MW)	Included	Included	Included	Included
DEC	Oakboro PV (40 MW)	Included	Included	Included	Included
DEC	Olin Creek PV (35 MW)	Included	Included	Included	Included
DEC	Partin PV (50 MW)	Included	Included	Included	Included
DEC	Pelham PV (32 MW)	Included	Included	Included	Included
DEC	Quail PV (30 MW)	Included	Included	Included	Included
DEC	Two Hearted PV (22 MW)	Included	Included	Included	Included
DEC	West River PV (40 MW)	Included	Included	Included	Included
DEC	Westminster PV (75 MW)	Included	Included	Included	Included
DEP	Cabin Creek Solar (70.2 MW)	Included	Included	Included	Included
DEP	Gold Valley Solar (78.8 MW)	Included	Included	Included	Included
DEP	Nutbush Solar (35.0 MW)	Included	Included	Included	Included
DEP	Camp Lejeune Battery (11.0 MW)	Included	Included	Included	Included
DEP	Sapony Creek Solar (23.4 MW)	Included	Included	Included	Included
DEP	Loftins Crossroads Solar (75.0 MW)	Included	Included	Included	Included
DEP	Mayo CC Unit 1 (450 MW)	Not Included	Not Included	Not Included	Included

Table 4

Major Generation[3] Facility Retirements in Models

Company	Generation Facility	2028S	2028/ 2029W	2033S	2033/ 2034W
DEC	Allen 1-5 (1083 MW)	Retired	Retired	Retired	Retired
DEC	Lee 3 (120 MW)	Retired	Retired	Retired	Retired
DEP	Blewett CTs 1-4 (68 MW)	Retired	Retired	Retired	Retired
DEP	Weatherspoon CTs 1-4 (164 MW)	Retired	Retired	Retired	Retired

[3] Major Generation Threshold is 10 MW or greater and connected to the transmission system.

3. Generation Dispatch

Each Participant provided a resource dispatch order for each of its DNRs for the DEC and DEP BAAs. Generation was dispatched for each Participant to meet that Participant's load in accordance with the designated dispatch order.

DEC models distribution-connected generation as being netted against the load at the transmission bus. Transmission-connected generation is modeled if it is either in-service or has an executed generator interconnection agreement at the time the models are built. Because only transmission-connected generation is modeled explicitly, the following assumptions do not apply to distribution-connected generation. Solar generation is available for dispatch up to the generator interconnection agreement value but is only dispatched at 80% of that value in summer models. Facilities with storage may be dispatched up to 100% of the generator interconnection agreement value depending on the amount of storage associated with the facility. The level of solar generation dispatch is jurisdiction-specific and is supported by operating data that can be reflective of various factors such as geography and plant design. Solar generation is not dispatched in winter models. The dispatch assumptions reflect the expected solar generation output coincident with the DEC peak load. DEC models 1,602.8 MW of transmission-connected solar generation available for dispatch, dispatched consistent with the previous dispatch assumptions.

DEP models solar generation in its power flow cases that is either in-service or has an executed generator interconnection agreement at the time the models are built. This includes transmission-connected as well as distribution-connected solar generation. The current 2028 summer power flow case has 1,366 MW of transmission-connected and 2,324 MW of distribution-connected solar generation for a total of 3,693 MW. In its summer peak cases, DEP scales the solar generation down to 50% of its maximum capacity to approximate the amount of solar generation that will be on-line coincident with the DEP peak load. This level of dispatch is jurisdiction-specific and is supported by operating

data reflective of various factors such as geography and plant design. Facilities with storage may be dispatched up to 100% of the generator interconnection agreement value depending on the amount of storage associated with the facility. For winter peak studies, DEP assumes that no solar generation will be available at the time of the winter peak. DEP models all transmission upgrades that are determined necessary by the respective generation interconnection studies.

III.B. Study Criteria

The results of the base reliability study, the resource supply option study, and the Local Economic Study were evaluated using established planning criteria. The planning criteria used to evaluate the results include:

1) NERC Reliability Standards;
2) SERC requirements; and
3) Individual company criteria.

III.C. Case Development

The base case for the base reliability study was developed using the most current 2022 series NERC Multiregional Modeling Working Group ('MMWG") model for the systems external to DEC and DEP. The MMWG model of the external systems, in accordance with NERC MMWG criteria, included modeling known long-term firm transmission reservations. Detailed internal models of the DEC and DEP East/West systems were merged into the base case, including DEC and DEP transmission additions planned to be in service by the period under study. In the base cases, all confirmed long-term firm transmission reservations with roll-over rights were modeled**.**

III.D. Transmission Reliability Margin

NERC defines Transmission Reliability Margin ("TRM") as:

> *The amount of transmission transfer capability necessary to provide reasonable assurance that the interconnected transmission network will be secure. TRM accounts for the inherent uncertainty in system conditions and the need for operating flexibility to ensure reliable system operation as system conditions change.*

DEP's reliability planning studies model all confirmed transmission obligations for its BAA in its base case. Included in this is TRM for use by all LSEs. TRM is composed of contracted VACAR reserve sharing and inrush impacts. DEP models TRM by scheduling the reserved amount on actual reserved interfaces as posted on the DEP Open Access Same-time Information System ("OASIS").

In the planning horizon, DEC ensures VACAR reserve sharing requirements can be met through decrementing Total Transfer Capability ("TTC") by the TRM value required on each interface. Sufficient TRM is maintained on all DEC-VACAR interfaces to allow both export and import of the required VACAR reserves. DEC posts the TRM value for each interface on the DEC OASIS.

Both DEP and DEC ensure that TRM is maintained consistent with NERC requirements. The major difference between the methodologies used in planning by the two companies to calculate TRM is that DEP uses a flow-based methodology, while DEC decrements previously calculated TTC values on each interface.

III.E. Technical Analysis and Study Results

Contingency screenings on the base cases and scenarios were performed using Power System Simulator for Engineering ("PSS/E") power flow or equivalent. DEC and DEP each simulated its own transmission and generation down contingencies on its own transmission system.

DEC created generation down cases that assume a major unit is removed from service and the system is economically redispatched to make up for the loss of generation.

Generation down cases were developed for the following units:

Bad Creek 1	Cliffside 6	McGuire 2
Belews Creek 1	Dan River CC	Mill Creek 1
Broad River 1	Jocassee 1	Nantahala
Buck CC	Kings Mountain CC	Oconee 1
Catawba 1	Lee CC	Oconee 3
Cherokee Co-gen	Lincoln 1	Rockingham 1
Cleveland 1	Lincoln 17	Rowan CC
Cliffside 5	Marshall 3	Thorpe
McGuire 1		

Additionally, generation down cases for transmission-connected solar sites were created. These cases reflected one of two assumptions: 1) an individual solar site being unavailable or 2) a group of solar sites being unavailable. For the latter, engineering judgement was used to group transmission-connected solar sites in common geographic areas.

Outages involving one or more of the following transmission-connected solar sites were considered:

Apex	Hornet	Pinson
Apple 2	Hunters Cove	Quail
Apple 3	Lick Creek	Ruff
Aquadale	Maiden Creek	Rutherford
Ayrshire	McBride	Speedway
Bear Branch	Misenheimer	Stanly
Beaverdam	Mocksville	Stony Knoll
Broad River	Monroe	Sugar
Brookcliff	Newberry	Sun Edison
Gaston	Oakboro	Two Hearted
Healing Springs	Partin	West River
High Shoals	Pelham	Westminster
Olin Creek	Blackburn	

DEP created generation down cases which included the use of TRM, as discussed in Section III.D. DEP TRM cases model interchange to avoid netting against imports, thereby creating a worst-case import scenario. TRM cases were developed for the following units:

Brunswick 1	Brunswick 2
Harris	Robinson 2
Asheville CC1	

To understand impacts on each other's system, DEC and DEP have shared their transmission contingency and monitored elements files in order for each company to simulate the impact of the other company's contingencies on its own transmission system. In addition, each company coordinated generation adjustments to accurately reflect the impact of each company's generation patterns.

The technical analysis was performed in accordance with the study methodology. The results from the technical analysis for the DEC and DEP systems were shared with all Participants. Solutions of known issues within DEC and DEP were discussed. New or emerging issues identified in the 2023 Study were also discussed with all Participants so that all are aware of potential issues. Appropriate solutions were developed and tested.

The results of the technical analysis were discussed throughout the study area based on thermal loadings greater than 90% for base reliability, and greater than 80% for resource supply options and local economic studies to allow evaluation of project acceleration.

III.F. Assessment and Problem Identification

DEC and DEP performed an assessment in accordance with the methodology and criteria discussed earlier in this section of this report, with the analysis work shared by DEC and DEP. The reliability issues identified from the assessments of both the base reliability cases and

the Local Economic Study scenarios were documented and shared within the PWG. These results will be reviewed and discussed with the stakeholder group for feedback.

III.G. Solution Development

The 2023 Study performed by the PWG confirmed base reliability problems already identified (i) by DEC and DEP in company-specific planning studies performed individually by the transmission owners and (ii) by the 2022 Study. The PWG participated in the review of potential solution alternatives to the identified base reliability problems and to the issues identified in the resource supply option analysis. The solution alternatives were simulated using the same assumptions and criteria described in Sections III.A through III.E. DEC and DEP developed planning cost estimates and construction schedules for the solution alternatives.

III.H. Selection of Preferred Reliability Solutions

For the base reliability study, the PWG compared solution alternatives and selected the preferred solution, balancing cost, benefit and risk. The PWG selected a preferred set of transmission improvements that provide a reliable and cost-effective transmission solution to meet customers' needs while prudently managing the associated risks.

III.I. Contrast NCTPC Report to Other Regional Transfer Assessments

For both the DEC and DEP BAAs, the results of the PWG study are consistent with SERC Long-Term Working Group ("LTWG") studies performed for similar timeframes. LTWG studies have recently been performed for the 2028 summer timeframe. The limiting facilities identified in the PWG study of base reliability have been previously identified in the LTWG studies for similar scenarios. These limiting facilities have also been identified in the individual transmission owner's internal assessments required by NERC reliability standards.

IV. Base Reliability Study Results

The 2023 Study verified that DEC and DEP have projects already planned to address reliability concerns for the near-term (5 year) and long-term (10 year) planning horizons. There were no unforeseen problems identified in the reliability studies performed on the base cases.

The 2023 Plan is detailed in Appendix C which identifies the new and updated projects planned. Projects in the 2023 Plan are those projects identified in the base reliability study. For each of these projects, Appendix C provides the project status, the estimated cost, the planned in-service date, and the estimated time to complete the project.

The total estimated cost for the 58 reliability projects included in the 2023 Plan is $1.937 billion as documented in Appendix C. This compares to the original 2022 Plan estimate of $936 million for 24 reliability projects. In-service dates and cost estimates for some projects that are planned or underway have been revised based on updated information. An update to the 2022 Plan was provided in the 2022 Mid-Year Update published in July 2023 with an updated cost estimate of $897 million. See Appendix G for a detailed comparison of this year's Plan to the updated 2022 Plan.

V. Local Public Policy Study Results

The total estimated cost for the 15 Public Policy projects included in the 2023 Plan is $503 million as documented in Appendix E. This compares to the original 2022 Plan estimate of $554 million for 14 Public Policy projects. In-service dates and cost estimates for some projects that are planned or underway have been revised based on updated information. An update to the 2022 Plan was provided in the 2022 Mid-Year Update published in July 2023 with an updated cost estimate of $567 million. See Appendix G for a detailed comparison of this year's Plan to the updated 2022 Plan.

For the 2023 Study, the NCTPC received two Public Policy Study requests: (1) the interconnection of high volumes of solar and solar plus storage to the DEC and DEP transmission systems; and (2) the generation retirements and resource supply additions as provided in the 2022 Duke Carbon Plan Portfolios. The final scope of the 2023 Public Policy Study assumed a combination of scenarios from these two requests, incorporating input from the NCTPC/OSC and in consultation and coordination with the two study requestors. The Public Policy Study analysis is still in progress. The results of the 2023 Public Policy Study will be published in a supplemental report at a later date, anticipated to be Q1 2024.

VI. Local Economic Study Results

The were no Local Economic Studies requested.

VII. Collaborative Transmission Plan

The 2023 Transmission Plan includes 58 reliability projects and 15 Public Policy projects. The reliability projects are listed in Appendix C with detailed project descriptions in Appendix D. The total estimated cost for the 58 reliability projects is $1.937 billion. The 15 approved Public Policy projects are listed in Appendix E with detailed project descriptions in Appendix F. The total estimated cost for the 15 Public Policy projects is $503 million. The total for all the projects included in the 2023 Transmission Plan is $2.440 billion. Comparisons to the 2022 Plan and 2022 Mid-Year Update are shown in the table below.

	2022 Plan		**2022 Mid-Year Update**		**2023 Plan**	
	# of Projects	Estimated Cost ($million)	# of Projects	Estimated Cost ($million)	# of Projects	Estimated Cost ($million)
Reliability Projects	24	$936	24	$897	58	$1,937
Public Policy Projects	14	$554	14	$567	15	$503
Total	**38**	**$1,490**	**38**	**$1,464**	**73**	**$2,440**

The detailed project descriptions in Appendix D and E includes the following information:

1) Project ID: Description of the project.

2) Issue Resolved: Specific driver for project.

3) Status: Status of development of the project as described below:

   a. In-Service – Projects with this status are in-service.
   b. Underway – Projects with this status range from the Transmission Owner having some money in its current year budget for the project to the Transmission Owner having completed some construction activities for the project.
   c. Planned – Projects with this status do not have money in the

Transmission Owner's current year budget and the project is subject to change.

d. Conceptual – Projects with this status are not Planned at this time but will continue to be evaluated as a potential project in the future.
e. Deferred – Projects with this status were identified in the 2022 Report and have been deferred beyond the end of the planning horizon based on the 2023 Study results.
f. Removed - Project is cancelled and no longer in the plan.

4) Transmission Owner: Responsible equipment owner designated to design and implement the project.

5) Projected In-Service Date: The date the project is expected to be placed in service.

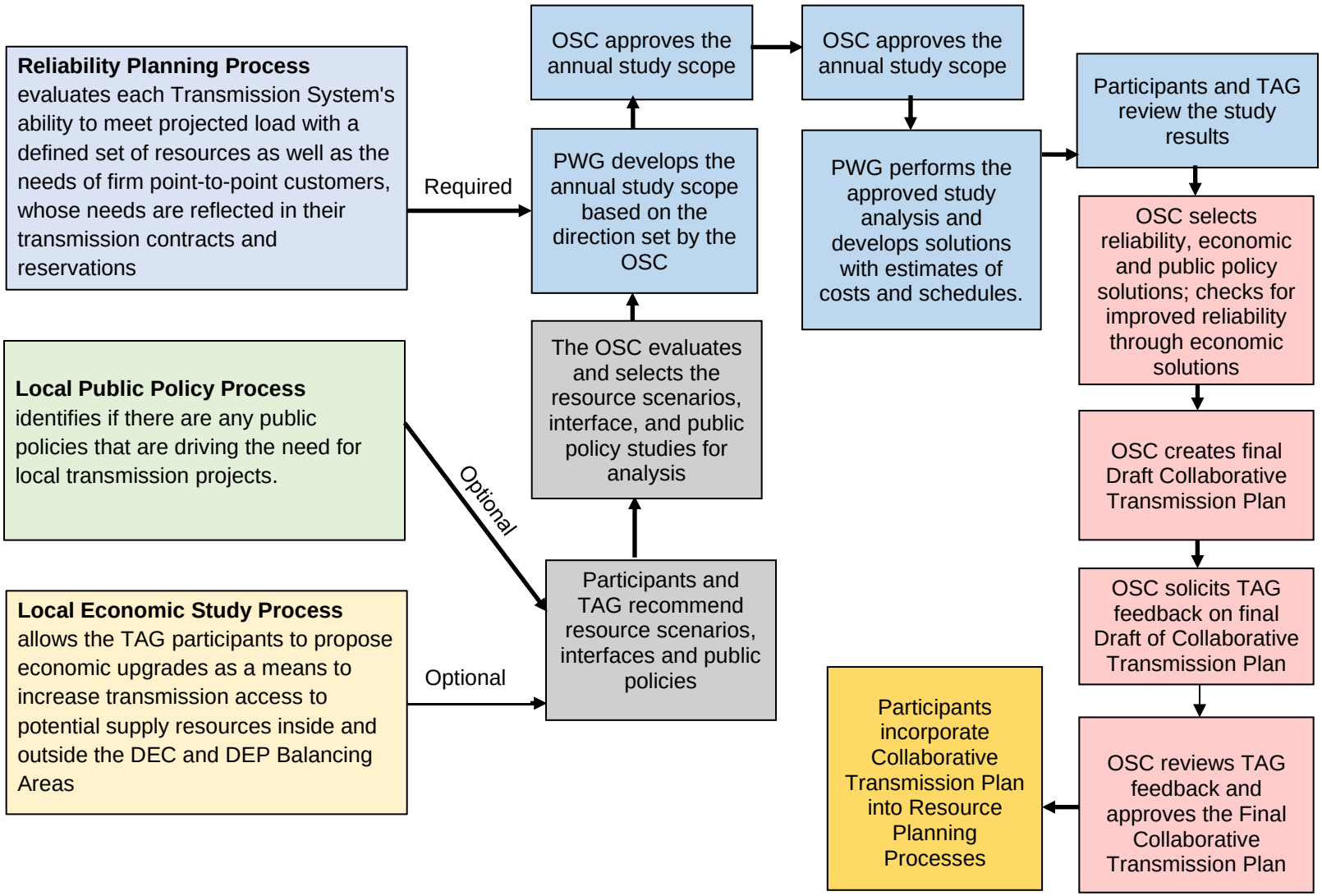
6) Estimated Cost: The estimated cost, in nominal dollars, which reflects the sum of the estimated annual cash flows over the expected development period for the specific project (typically 2 – 5 years), including direct costs, loadings and overheads, but not including AFUDC. Each year's cash flow is escalated to the year of the expenditures. The sum of the expected cash flows is the estimated cost.

7) Project lead time: Number of years needed to complete project. For projects with the status of Underway, the project lead time is the time remaining to complete construction of the project and place the project in service.

See Appendix G for a detailed comparison of this year's Plan to the updated 2022 Plan. The list of 2023 Transmission Plan projects will continue to be modified on an ongoing basis as new improvements are identified through the NCTPC Process and projects are placed in-service or eliminated from the list.

Appendix A NCTPC Process Flow Chart

2023 NCTPC Process Flow Chart



Appendix B
Interchange Tables

DUKE ENERGY CAROLINAS

DETAILED INTERCHANGE (BASE)

Duke Energy Carolinas Modeled Imports – MW

	28S	28/29W	33S	33/34W
CPLE (NCEMC–Hamlet)	165	165	165	165
SCEG (Chappells)	2	2	2	2
SCPSA (PMPA)	197	84	210	97
SCPSA (Seneca)	30	27	31	28
SEPA (Hartwell)	181	181	181	181
SEPA (Thurmond)	113	113	113	113
SOCO (NCEMC)	45	45	45	45
Total	**733**	**617**	**747**	**631**

Duke Energy Carolinas Modeled Exports – MW

	28S	28/29W	33S	33/34W
CPLE (Broad River)	875	875	875	875
CPLE (Cleveland)	196	196	0	0
CPLE (KMEC)	87	87	87	87
CPLE (NCEMC–Catawba)	307	307	307	307
CPLE (Rowan)	370	180	0	0
PJM (NCEMC–Catawba)	100	100	100	100
SCEG (KMEC)	5	5	5	5
SCEG (Orangeburg)	300	300	300	300
SCPSA (Haile)	23	23	23	23
SCPSA	250	250	250	250
Total	**2513**	**2323**	**1947**	**1947**

Duke Energy Carolinas Net Interchange – MW

	28S	28/29W	33S	33/34W
Net Interchange	**1780**	**1706**	**1200**	**1316**

Note: Positive net interchange indicates an export and negative interchange an import.

DUKE ENERGY PROGRESS (EAST)

DETAILED INTERCHANGE (BASE)

Duke Energy Progress (East) Modeled Imports – MW

	28S	28/29W	33S	33/34W
PJM (NCEMC–AEP)	100	100	100	100
PJM (NCEMC)	75	75	75	75
DUK (Broad River)	875	875	875	875
DUK (Cleveland)	196	196	0	0
DUK (NCEMC–Catawba)	307	307	307	307
DUK (KMEC)	87	87	87	87
DUK (Rowan)	370	180	0	0
PJM (SEPA–KERR)	95	95	95	95
Total	**2105**	**1915**	**1539**	**1539**

Duke Energy Progress (East) Modeled Exports – MW

	28S	28/29W	33S	33/34W
CPLW (Transfer)	0	150	0	200
PJM (NCEMC–Hamlet)	165	165	165	165
DUK (NCEMC–Hamlet)	165	165	165	165
Total	**330**	**480**	**330**	**530**

Duke Energy Progress (East) Net Interchange – MW

	28S	28/29W	33S	33/34W
Net Interchange	**-1775**	**-1435**	**-1209**	**-1009**

Note: Positive net interchange indicates an export and negative interchange an import.

DUKE ENERGY PROGRESS (WEST)

DETAILED INTERCHANGE (BASE)

Duke Energy Progress (West) Modeled Imports – MW

	28S	28/29W	33S	33/34W
CPLE (Transfer)	0	150	0	200
SCPSA (Waynesville)	22	22	22	22
TVA (SEPA)	14	14	14	14
Total	**36**	**186**	**36**	**236**

Duke Energy Progress (West) Modeled Exports – MW

	28S	28/29W	33S	33/34W
—-	---	---		---
Total	**---**	**---**		**---**

Duke Energy Progress (West) Net Interchange – MW

	28S	28/29W	33S	33/34W
Net Interchange	**-36**	**-186**	**-36**	**-236**

Note: Positive net interchange indicates an export and negative interchange an import.

DUKE ENERGY PROGRESS (WEST), DUKE ENERGY PROGRESS (EAST)

DETAILED INTERCHANGE (TRM)

Duke Energy Progress (West) Modeled Imports – MW

	28S, 28/29W, 33S, 33/34W
AEP (TRM)	69
DUK (TRM)	191
TVA (TRM)	20
Total	**280**

Duke Energy Progress (East) Modeled Imports – MW

	28S, 28/29W, 33S, 33/34W
AEP (TRM)	100
DUK (TRM)	773
DVP (TRM)	427
SCEG (TRM)	200
SCPSA (TRM)	326
Total	**1826**

Note: Imports for TRM are in addition to Base transfers

Appendix C Transmission Plan Major Project Listings – Reliability Projects

2023 Collaborative Transmission Plan – Reliability Projects						
Project ID	**Reliability Project**	**Status[1]**	**Transmission Owner**	**Projected In-Service Date**	**Estimated Cost ($M)[2]**	**Project Lead Time (Years)[3]**
0024	Durham – RTP 230 kV Line, Reconductor	Underway	DEP	6/1/2027	20	3.5
0046	Windmere 100 kV Line (Dan River-Sadler), Construct	In-service	DEC	6/27/2023	28	-
0048	Wilkes 230/100 kV Tie Station, Construct	Underway	DEC	12/1/2025	66	2
0050	Craggy – Enka 230 kV Line, Construct	Underway	DEP	12/1/2024	94	1
0051	Cokesbury 100 kV Line (Coronaca–Hodges), Upgrade	Planned	DEC	12/1/2025	26	2
0052	South Point 100 kV Switching Station, Construct	Underway	DEC	12/1/2025	102	2
0053	Wateree Hydro Plant, Upgrade	In-service	DEP	12/1/2023	16	-
0054	Carthage 230/115 kV Substation, Construct	Underway	DEP	6/1/2026	28	2.5
0056	Castle Hayne – Folkstone 115 kV Line, Rebuild	Underway	DEP	6/1/2026	97	2.5
0057	Holly Ridge North 115 kV Switching Station, Construct	Underway	DEP	12/1/2026	12	3
0058	Coronaca 100 kV Line (Coronaca-Creto), Upgrade and Construct	Underway	DEC	6/1/2026	38	2.5
0059	Monroe 100 kV Line (Lancaster-Monroe), Upgrade	Underway	DEC	12/1/2027	73	4
0060	Westport 230 kV Line (McGuire-Marshall), Upgrade	Conceptual	DEC	TBD	43	4.5

2023 Collaborative Transmission Plan – Reliability Projects						
Project ID	**Reliability Project**	**Status[1]**	**Transmission Owner**	**Projected In-Service Date**	**Estimated Cost ($M)[2]**	**Project Lead Time (Years)[3]**
0061	Wateree 100 kV Line (Great Falls-Wateree), Upgrade	Underway	DEC	6/1/2024	11	0.5
0062	Silas 100 kV Line (Mocksville-Idols Tap), Upgrade	In-service	DEC	6/13/2023	24	-
0063	North Greenville 230 kV Tie Station, Upgrade	Underway	DEC	12/1/2025	23	2
0064	Wylie 100 kV Line (Wylie-Arrowood Retail), Upgrade	Underway	DEC	12/1/2026	15	3
0065	Morning Star 230 kV Tie Station, Upgrade	Planned	DEC	12/1/2032	38	4
0066	Davidson River 100 kV Line (North Greenville-Marietta), Upgrade	Planned	DEC	12/1/2030	17	4
0067	Harley 100 kV Line (Tiger-Campobello), Upgrade	Conceptual	DEC	TBD	45	4
0068	Sandy Ridge 230 kV Line (Newport-Morning Star), Upgrade	Planned	DEC	12/1/2029	34	6
0069	Skybrook 100 kV Line (Winecoff-Eastfield Retail), Upgrade	Conceptual	DEC	TBD	15	4
0086	Parkwood Tie 500/230 kV Bank 5, Replace	Underway	DEC	12/1/2024	42	1
0087	Breaker Station on Motley 100 kV Line for New Customer, Construct	Underway	DEC	6/1/2025	12	1.5
0088	Island Creek 44 kV, Conversion	Underway	DEC	6/1/2025	15	1.5
0089	McDowell Tie 230/100 kV Bank 2, Replace	Underway	DEC	6/1/2025	12	1.5
0090	Boyd Switching Station, Construct	Underway	DEC	6/1/2026	42	2.5

2023 Collaborative Transmission Plan – Reliability Projects						
Project ID	**Reliability Project**	**Status[1]**	**Transmission Owner**	**Projected In-Service Date**	**Estimated Cost ($M)[2]**	**Project Lead Time (Years)[3]**
0091	Haas Creek Switching Station, Construct	Underway	DEC	6/1/2026	44	2.5
0092	Lyle Creek Switching Station, Construct	Underway	DEC	6/1/2026	53	2.5
0093	Page and Guilford 100 kV Lines (Greensboro-North Greensboro), Upgrade	Planned	DEC	12/1/2026	17	3
0094	Cabarrus 100 kV Line (Wildcat-Westfork), Upgrade	Conceptual	DEC	TBD	13	3
0095	Sevier 100 kV Line (East Greenville-Verdae Retail Tap), Upgrade	Underway	DEC	12/1/2026	20	3
0096	Panther 100 kV Line (EMC Corp-Stallings Rd Retail), Network	Conceptual	DEC	TBD	56	4
0097	Dan River 100 kV Line (Dan River-North Greensboro), Upgrade	Conceptual	DEC	TBD	87	5
0098	Oliver 230 kV Line (Marshall-Boyd), Upgrade	Conceptual	DEC	TBD	60	5
0099	Reidsville and Wolf Creek 100 kV Lines (Dan River-Sadler), Upgrade	Conceptual	DEC	TBD	37	5
0100	Beulah 100 kV Line (Lookout-EnergyUnited Del 18), Upgrade	Conceptual	DEC	TBD	21	3.5
0101	Hinkle 100 kV Line (Stamey-Statesville), Upgrade	Conceptual	DEC	TBD	22	3.5
0102	Concord 100 kV Line (Concord-Concord City Del 3), Upgrade	Conceptual	DEC	TBD	11	3.5
0103	Crab Orchard 100 kV Line (Harrisburg-Amity), Upgrade	Planned	DEC	12/1/2028	15	4
0104	Hands Mill Switching Station, Construct	Underway	DEC	6/1/2027	51	3.5

2023 Collaborative Transmission Plan – Reliability Projects						
Project ID	**Reliability Project**	**Status[1]**	**Transmission Owner**	**Projected In-Service Date**	**Estimated Cost ($M)[2]**	**Project Lead Time (Years)[3]**
0105	Kennedy 100 kV Line (Orchard-Newton Tap), Upgrade	Conceptual	DEC	TBD	11	3.5
0107	Buckhorn 44 kV Line, Conversion	Underway	DEC	12/1/2024	11	1
0108	Messer 230 kV Line (Dixon School Rd-Customer), Construct	Planned	DEC	12/1/2026	14	3
0109	Terrell 44 kV Line, Conversion	Conceptual	DEC	TBD	26	4
0110	Troutman 44 kV Line, Conversion	Planned	DEC	6/1/2027	30	3.5
0115	Havelock 230/115 kV Banks 1 & 2, Replace	Underway	DEP	6/1/24	10	0.5
0116	Rocky Mount – Battleboro 115 kV Line, Reconductor	Underway	DEP	6/1/25	30	1.5
0117	Asheville Plant – Oteen 115 kV West Line (Arden), Construct	Underway	DEP	6/1/26	12	2.5
0118	Weatherspoon – LOF 115 kV Line (Weatherspoon-LREMC West Lumberton), Reconductor	Underway	DEP	12/1/26	27	3
0119	Weatherspoon – LOF 115 kV Line (Maxton-Pembroke), Reconductor	Underway	DEP	6/1/26	26	2.5
0120	Sumter – SCEG Eastover 115 kV Line (Kings Hwy – Shaw Field – Eastover), Reconductor	Planned	DEP	6/1/27	19	3.5
0121	Brush Creek 230 kV, Construct STATCOM	Planned	DEP	12/1/28	40	5
0122	Asheboro – Siler City 115 kV Line, Reconductor	Planned	DEP	12/1/28	75	5

2023 Collaborative Transmission Plan – Reliability Projects						
Project ID	**Reliability Project**	**Status[1]**	**Transmission Owner**	**Projected In-Service Date**	**Estimated Cost ($M)[2]**	**Project Lead Time (Years)[3]**
0123	Falls – Franklinton (Franklinton – Franklinton Novo 115 kV Feeder), Construct	Conceptual	DEP	TBD	16	8.5
0124	Castle Hayne-Folkstone 230 kV Line - Porters Neck 230 kV Tap Line, Construct	Underway	DEP	6/1/24	43	0.5
0125	Method – Milburnie 115 kV North Line, Reconductor	Planned	DEP	6/1/33	25	9.5
0126	Rockingham - West End 230 kV West Line, Reconductor	Conceptual	DEP	TBD	27	10
TOTAL					**1,937**	

[1] Status: ***In-service****:* Projects with this status are in-service. This status was updated as of 12/1/2023.

Underway*:* Projects with this status range from the Transmission Owner having some money in its current year budget for the project to the Transmission Owner having completed some construction activities for the project.

Planned*:* Projects with this status do not have money in the Transmission Owner's current year budget; and the project is subject to change.

Conceptual*:* Projects with this status are not p*lanned* at this time but will continue to be evaluated as a potential project in the future.

Deferred*:* Projects with this status were identified in the 2022 Report and have been deferred beyond the end of the planning horizon based on analysis performed to develop the 2023 Collaborative Transmission Plan.

Removed: Project is cancelled and no longer in the plan

[2] The estimated cost is in nominal dollars which reflects the sum of the estimated annual cash flows over the expected development period for the specific project (typically 2 – 5 years), including direct costs, loadings and overheads; but not including AFUDC. Each year's cash flow is escalated to the year of the expenditures. The sum of the expected cash flows is the estimated cost.

[3] For projects with a status of Underway, the project lead time is the time remaining to complete construction and place in-service.

Appendix D Transmission Plan Major Project Descriptions – Reliability Projects

Table of Contents

Project ID	Project Name
0094	Cabarrus 100 kV Line (Wildcat-Westfork), Upgrade
0095	Sevier 100 kV Line (East Greenville-Verdae Retail Tap), Upgrade
0096	Panther 100 kV Line (EMC Corp-Stallings Rd Retail), Network
0097	Dan River 100 kV Line (Dan River-North Greensboro), Upgrade
0098	Oliver 230 kV Line (Marshall-Boyd), Upgrade
0099	Reidsville and Wolf Creek 100 kV Lines (Dan River-Sadler), Upgrade
0100	Beulah 100 kV Line (Lookout-EnergyUnited Del 18), Upgrade
0101	Hinkle 100 kV Line (Stamey-Statesville), Upgrade
0102	Concord 100 kV Line (Concord-Concord City Del 3), Upgrade
0103	Crab Orchard 100 kV Line (Harrisburg-Amity), Upgrade
0104	Hands Mill Switching Station, Construct
0105	Kennedy 100 kV Line (Orchard-Newton Tap), Upgrade
0107	Buckhorn 44 kV Line, Conversion
0108	Messer 230 kV Line (Dixon School Rd-Customer), Construct
0109	Terrell 44 kV Line, Conversion
0110	Troutman 44 kV Line, Conversion
0115	Havelock 230/115 kV Banks 1 & 2, Replace
0116	Rocky Mount – Battleboro 115 kV Line, Reconductor
0117	Asheville Plant – Oteen 115 kV West Line (Arden), Construct
0118	Weatherspoon – LOF 115 kV Line (Weatherspoon-LREMC West Lumberton), Reconductor
0119	Weatherspoon – LOF 115 kV Line (Maxton-Pembroke), Reconductor
0120	Sumter – SCEG Eastover 115 kV Line (Kings Hwy – Shaw Field – Eastover), Reconductor
0121	Brush Creek 230 kV, Construct STATCOM
0122	Asheboro – Siler City 115 kV Line, Reconductor
0123	Falls – Franklinton (Franklinton – Franklinton Novo 115 kV Feeder), Construct
0124	Castle Hayne-Folkstone 230 kV Line - Porters Neck 230 kV Tap Line, Construct
0125	Method – Milburnie 115 kV North Line, Reconductor
0126	Rockingham - West End 230 kV West Line, Reconductor

Note: The estimated cost for each of the projects described in this Appendix D is in nominal dollars which reflects the sum of the estimated annual cash flows over the expected development period for the specific project (typically 2 – 5 years), including direct costs, loadings and overheads; but not including AFUDC. Each year's cash flow is escalated to the year of the expenditures. The sum of the expected cash flows is the estimated cost.

Project ID and Name: 0024 – Durham–RTP 230 kV Line, Reconductor

Project Description
Reconductor approximately 4.6 miles of 230 kV line with 6–1590 ACSR conductor.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2027
Estimated Time to Complete	3.5 years
Estimated Cost	$20 M

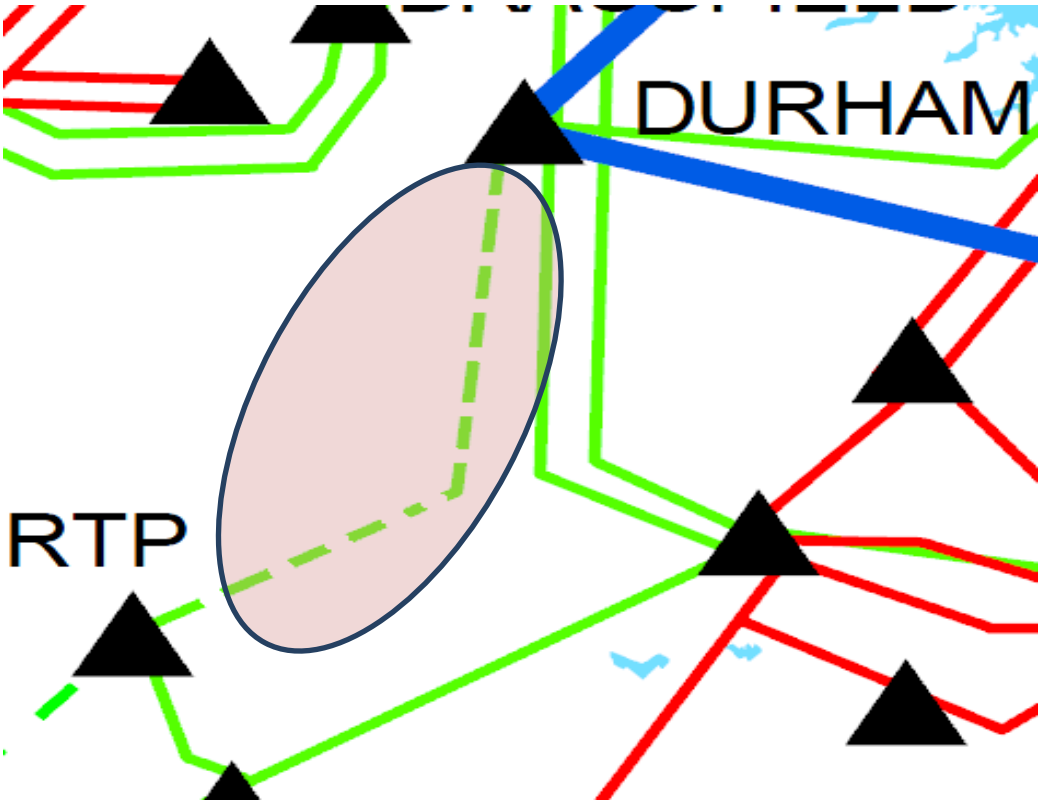
Narrative Description of the Need for this Project
With Harris Plant down, a common tower outage of the Method (DEC)–East Durham and the Durham–Method 230 kV Lines will cause an overload of the Durham 500 kV Sub-RTP 230 kV Switching Station Line. This upgraded is needed to serve the new Wolfspeed industrial customer load.

Other Transmission Solutions Considered
Construct a new line between Durham and RTP 230 kV subs.

Why this Project was Selected as the Preferred Solution
Cost and feasibility. Reconductoring is much more cost effective.

Durham–RTP 230 kV Line

- **NERC Category P3 Violation**
- **Problem:** With Harris Plant down, a common tower outage of the Method (DEC)–East Durham and the Durham–Method 230 kV Lines will cause an overload of the Durham 500 kV Sub-RTP 230 kV Switching Station Line. This upgrade is needed to serve the new Wolfspeed industrial customer load.
- **Solution:** Reconductor approximately 4.6 miles of 230 kV line with 6-1590 ACSR conductor.



Project ID and Name: 0046 – Windmere 100 kV Line (Dan River–Sadler), Construct

Project Description
This project consists of building a new 100 kV line (954 ACSR) along an existing ROW.

Status	In-service
Transmission Owner	DEC
Planned In-Service Date	6/27/2023
Estimated Time to Complete	-
Estimated Cost	$28 M

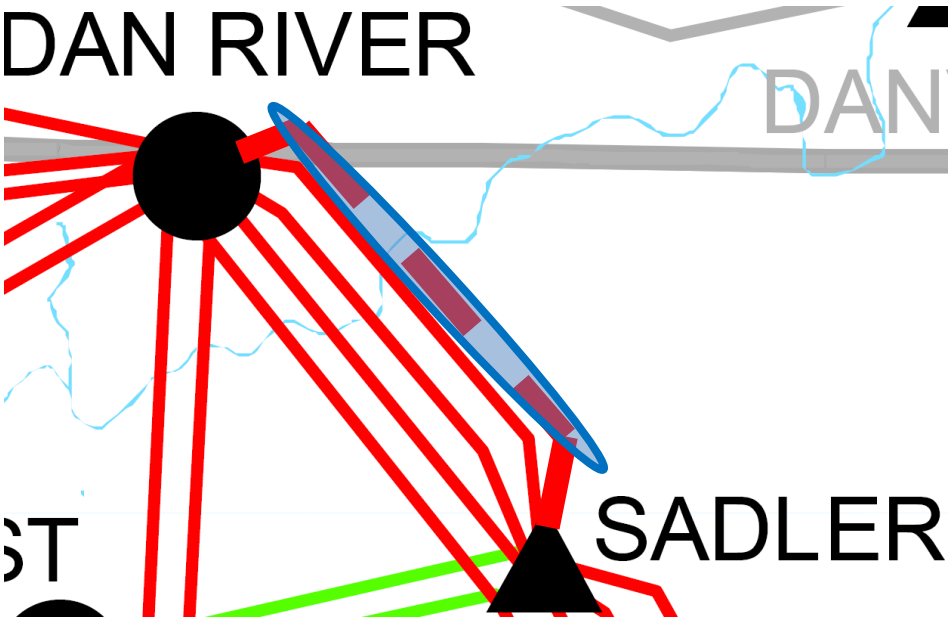
Narrative Description of the Need for this Project
The Reidsville and Wolf Creek 100 kV lines (Dan River–Sadler) can become overloaded for the loss of any of the circuits between Dan River and Sadler.

Other Transmission Solutions Considered
Rebuilding both double circuit 100 kV lines (≈8 miles each) between Dan River and Sadler.

Why this Project was Selected as the Preferred Solution
Greater operational flexibility in the area.

Windmere 100 kV Line (Dan River–Sadler), Construct

- **NERC Category P3 violation**
- **Problem:** Loss of any of the four existing 100 kV circuits between Dan River and Sadler and can overload the remaining circuits.
- **Solution:** Construct new 100 kV line.



Project ID and Name: 0048 – Wilkes 230/100 kV Tie Station, Construct

Project Description
This project consists of building a new 230/100 kV Wilkes tie station and re-routing local transmission lines.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	12/1/25
Estimated Time to Complete	2 years
Estimated Cost	$66 M

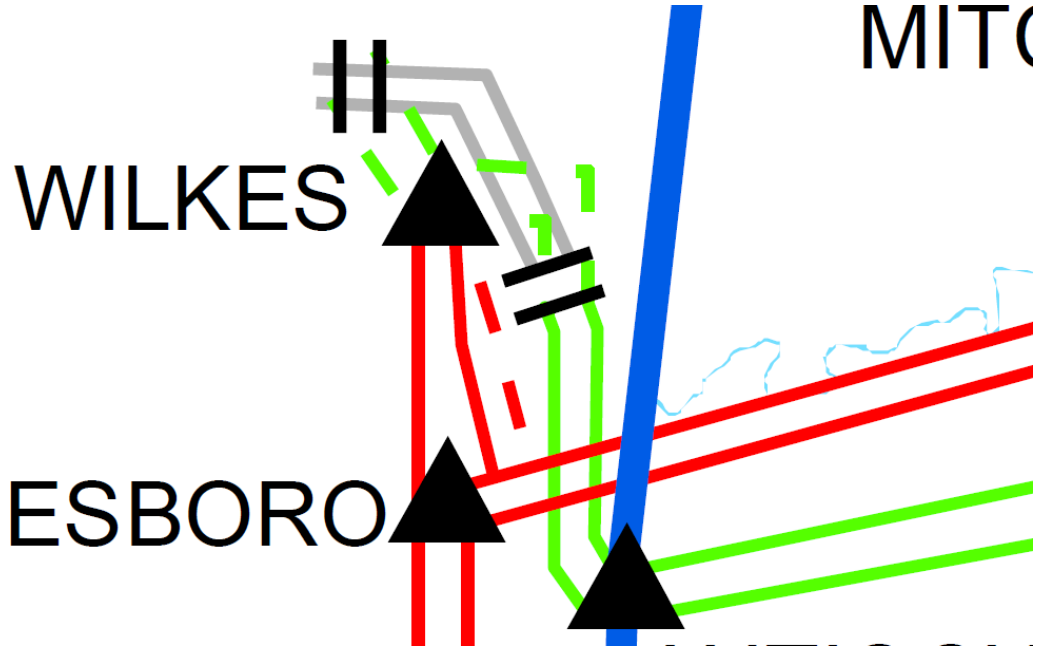
Narrative Description of the Need for this Project
The primary driver for this project is to increase support in the area around Wilkesboro NC. Contingencies, especially in the winter, have the tendency to drop voltage in the area as well as some thermal loading concerns with the loss of the Oxford 100 kV line. The secondary driver is to alleviate the need to rebuild N Wilkesboro Tie as a result of the need to install a bus junction breaker at N Wilkesboro Tie. Presently, loss of the single N Wilkesboro bus takes out six 100 kV lines, causes loss of load and low voltage problems in the area. Installation of a bus junction breaker would also cause thermal loading issues requiring a line upgrade. This project also makes use of 230 kV transmission lines that pass adjacent to the new 230/100 kV tie station.

Other Transmission Solutions Considered
Rebuild N Wilkesboro Tie to allow installation of a bus tie breaker.

Why this Project was Selected as the Preferred Solution
Greater long-term value to system and operational flexibility in the area.

Wilkes 230/100 kV Tie Station, Construct

- **NERC Category P1, P2, & P3 violation**
- **Problem:** Contingency events in the Wilkesboro, NC area cause thermal loading issues, loss of load and low voltage problems in the area.
- **Solution:** Construct new 230/100 kV tie station.



Project ID and Name: 0050 – Craggy-Enka 230 kV Line, Construct

Project Description
This project consists of constructing approximately 10 miles of a new 230 kV transmission line between the Craggy and Enka Substations.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	12/1/2024
Estimated Time to Complete	1 year
Estimated Cost	$94 M

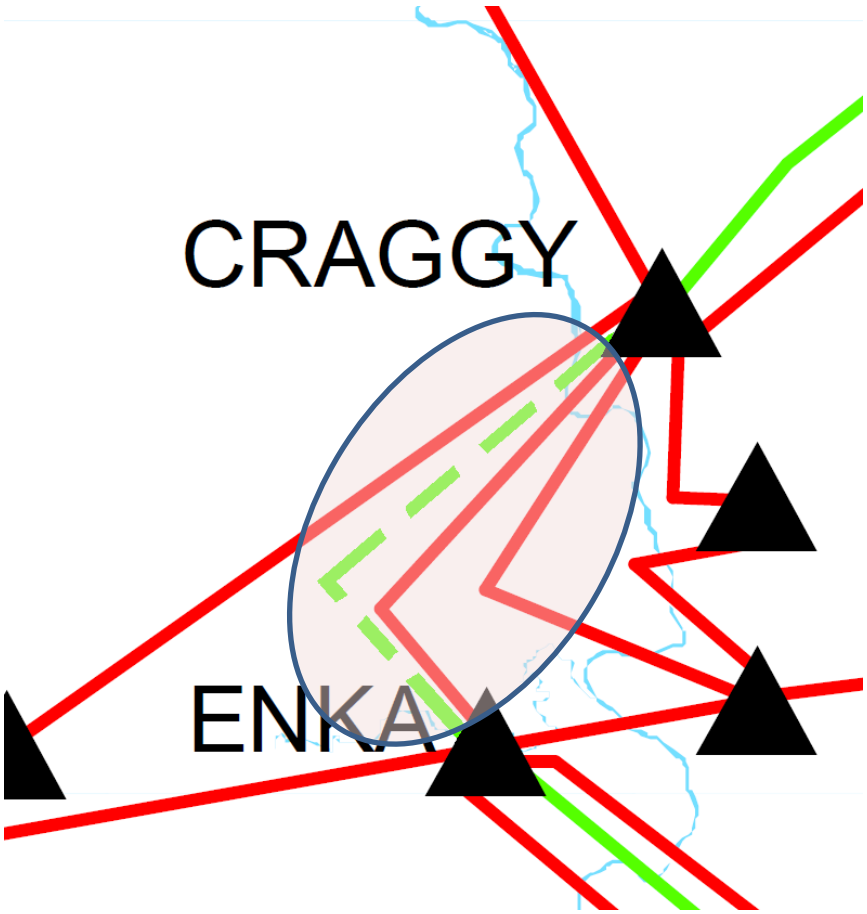
Narrative Description of the Need for this Project
Opening the Asheville end of the Oteen 115 kV West line overloads the Enka – West Asheville 115 kV line. Also, a NERC P6 outage of Craggy–Enka 115 and Asheville–Oteen 115 West lines has no viable operating procedure beginning 12/1/2025. Outage of the West Asheville 115 kV bus overloads the Craggy–Enka 115 kV line.

Other Transmission Solutions Considered
Reconductoring multiple transmission lines. These include the Enka–West Asheville 115 kV Line, the Craggy–Enka 115 kV line, the Canton–Craggy 115 kV Line, and the Asheville–Oteen 115 kV East Line.

Why this Project was Selected as the Preferred Solution
Cost and feasibility.

Craggy–Enka 230 kV Line, Construct

- **NERC Category P3 & P6 violation**
- **Problem:** Opening the Asheville end of the Oteen 115 kV West line overloads the Enka – West Asheville 115 kV line. Also, a NERC P6 outage of Craggy–Enka 115 kV and Asheville–Oteen 115 kV West lines has no viable operating procedure beginning 12-2025. Outage of the West Asheville 115 kV bus overloads the Craggy–Enka 115 kV line.
- **Solution:** Construct the Craggy–Enka 230 kV Line.



Project ID and Name: 0051 – Cokesbury 100 kV Line (Coronaca–Hodges), Upgrade

Project Description
This project consists of rebuilding 9.2 miles of the existing 477 ACSR conductor with 1272 ACSR.

Status	Planned
Transmission Owner	DEC
Planned In-Service Date	12/1/25
Estimated Time to Complete	2 years
Estimated Cost	$26 M

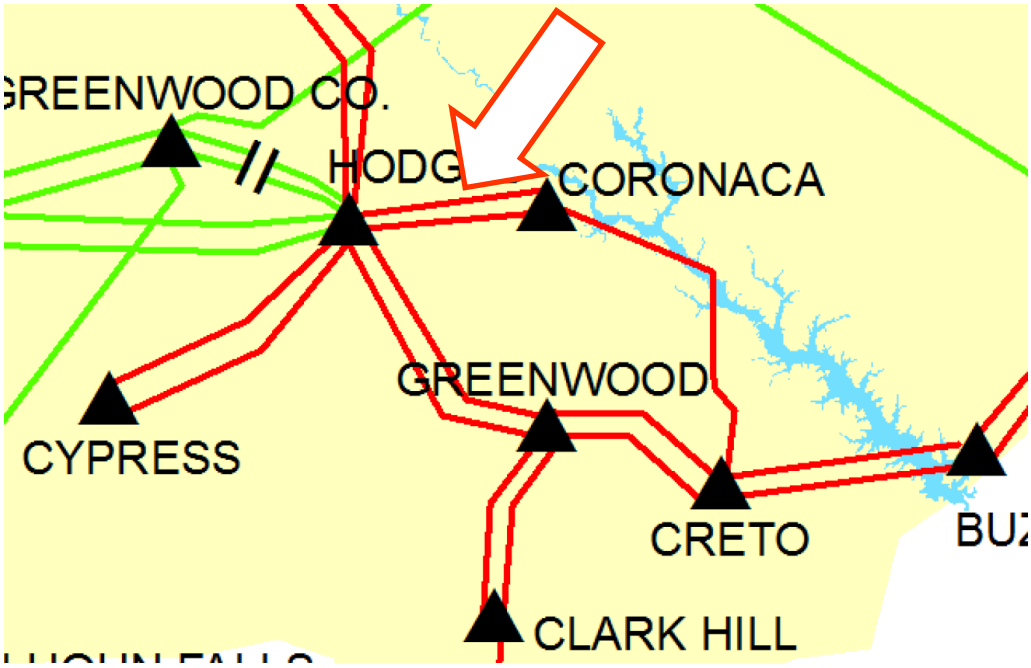
Narrative Description of the Need for this Project
These lines may become overloaded for loss of one of the circuits.

Other Transmission Solutions Considered
New transmission line(s).

Why this Project was Selected as the Preferred Solution
New transmission line(s) would require additional right-of-way, adding to the cost of the project.

Cokesbury 100 kV Line (Coronaca–Hodges), Upgrade

- **NERC Category P3 violation**
- **Problem:** Loss of one of the Greenwood–Hodges 100 kV lines may overload the remaining line.
- **Solution:** Rebuild 100 kV lines with higher capacity conductors.



Project ID and Name: 0052 – South Point 100 kV Switching Station, Construct

Project Description
This project consists of replacing (in a new location) the 100 kV switchyard at Allen Steam Station and upgrading the existing 230/100 kV transformers.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	12/1/25
Estimated Time to Complete	2 years
Estimated Cost	$102 M

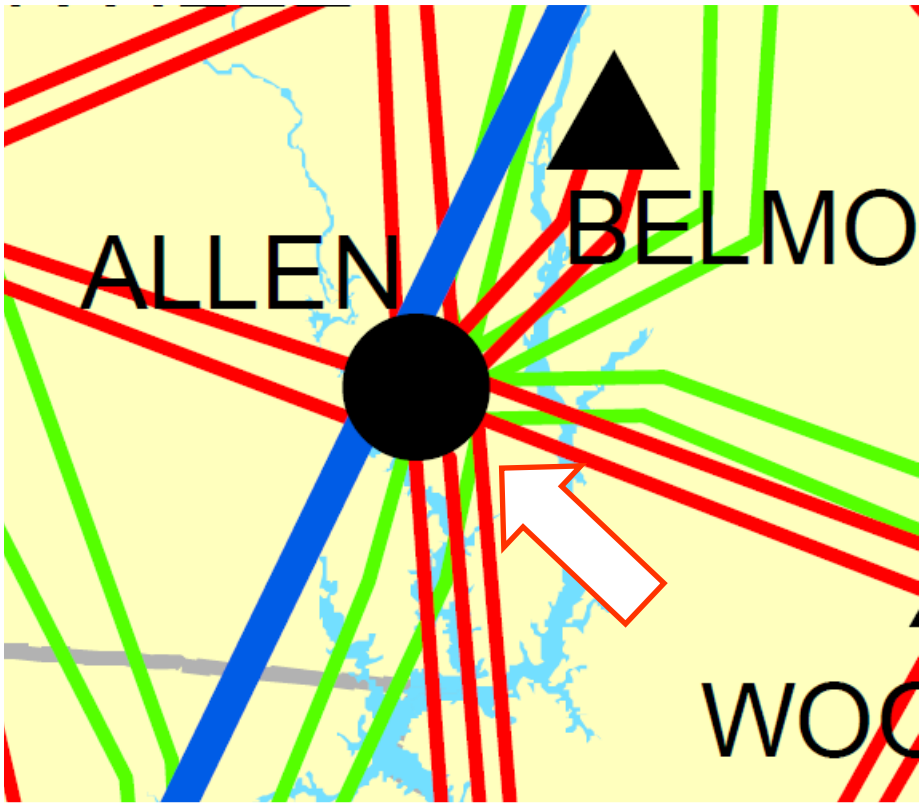
Narrative Description of the Need for this Project
The transformers may become overloaded for loss of the other transformer, and there are obsolescence issues with the existing switchyard at Allen Steam Station.

Other Transmission Solutions Considered
Convert Wylie Switching Station to 230/100 kV. Rebuild Allen Steam Station in its current location and replace existing 230/100 kV transformers at Allen Steam Station.

Why this Project was Selected as the Preferred Solution
Cost and timing

South Point 100 kV Switching Station, Construct

- **NERC Category P3 Violation**
- **Problem:** Post-generation retirement at Allen Steam Station, loss of one 230/100 kV transformers at Allen may overload the remaining transformer.
- **Solution:** Upgrade to larger transformers



Project ID and Name: 0053 – Wateree Hydro Plant, Upgrade

Project Description
This project consists of replacing the two existing 115/100 kV autotransformers at Wateree Plant with two new 168 MVA 115/100 kV autotransformers. While the two existing 115/100 kV Wateree transformers share a single breaker, the new transformers will have separate breakers so that either one can trip out with the other bank still transferring power between DEP and DEC. (The Wateree Plant is owned by DEC, but the existing 115/100 kV transformers and the 115 kV bus are owned by DEP.)

Status	In-Service
Transmission Owner	DEP
Planned In-Service Date	12/1/2023
Estimated Time to Complete	-
Estimated Cost	$16 M

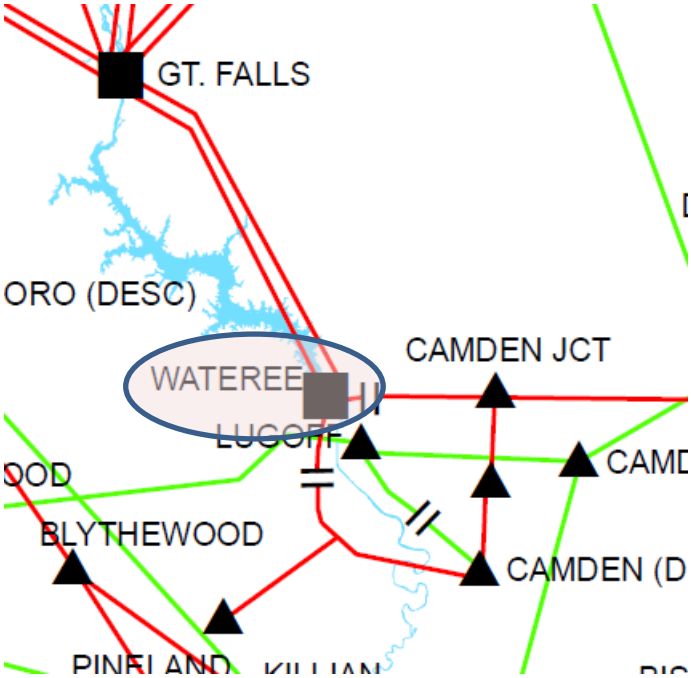
Narrative Description of the Need for this Project
By winter 2023-24, the NERC P3 outage of Robinson Nuclear plus outage of either the Richmond–Newport 500 kV line or the Camden–Lugoff 230 kV line causes an overload of the existing Wateree 115/100 kV transformers. In addition, the existing Wateree 115/100 kV transformers have reached end of life based on analysis from Asset Management.

Other Transmission Solutions Considered
New transmission lines.

Why this Project was Selected as the Preferred Solution
The cost and construction feasibility are much better with selected alternative.

Wateree Hydro Plant, Upgrade

- **NERC Category P3 violation**
- **Problem:** By winter 2023-24, the NERC P3 outage of Robinson Nuclear plus outage of either the Richmond–Newport 500 kV line or the Camden–Lugoff 230 kV line causes an overload of the existing Wateree 115/100 kV transformers. In addition, the existing Wateree 115/100 kV transformers have reached end of life based on analysis from Asset Management.
- **Solution:** Upgrade existing transformers.



Project ID and Name: 0054 – Carthage 230/115 kV Substation, Construct

Project Description
Construct a new 230/115 kV substation near the existing Carthage 115 kV substation. Loop in the existing Cape Fear–West End 230 kV line and West End–Southern Pines 115 kV feeder. The new Carthage 230–West End 115 kV line will be normally open at Carthage 230.kV.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2026
Estimated Time to Complete	2.5 years
Estimated Cost	$28 M

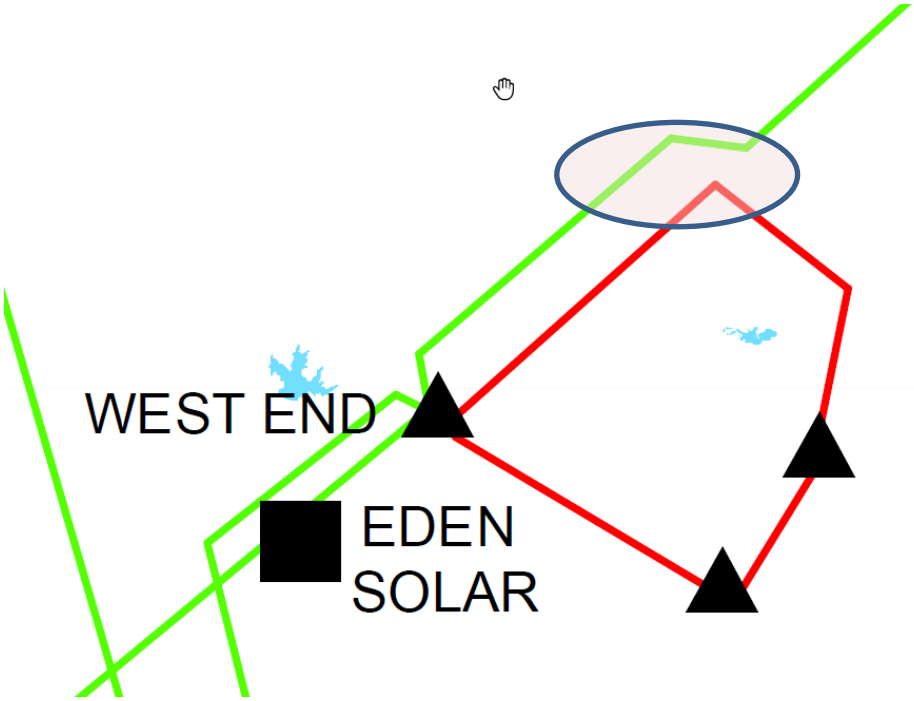
Narrative Description of the Need for this Project
By winter 2025-26, the NERC P1 outage of one West End transformer overloads the other and voltage at Southern Pines 115 kV drops below criteria.

Other Transmission Solutions Considered
Convert several 115 kV substations to 230 kV.

Why this Project was Selected as the Preferred Solution
The cost and construction feasibility are much better with selected alternative.

Carthage 230/115 kV Substation, Construct

- **NERC Category P1 violation**
- **Problem:** By winter 2025-26, the NERC P1 outage of one West End transformer overloads the other and voltage at Southern Pines 115 kV drops below criteria.
- **Solution:** Construct new 230/115 kV substation in the Carthage area.



Project ID and Name: 0056 – Castle Hayne–Folkstone 115 kV Line, Rebuild

Project Description
Rebuild approximately 25.91 miles of 115 kV line (Castle Hayne 230 kV Sub to structure #251) with 1272 MCM ACSR or equivalent.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2026
Estimated Time to Complete	2.5 years
Estimated Cost	$97 M

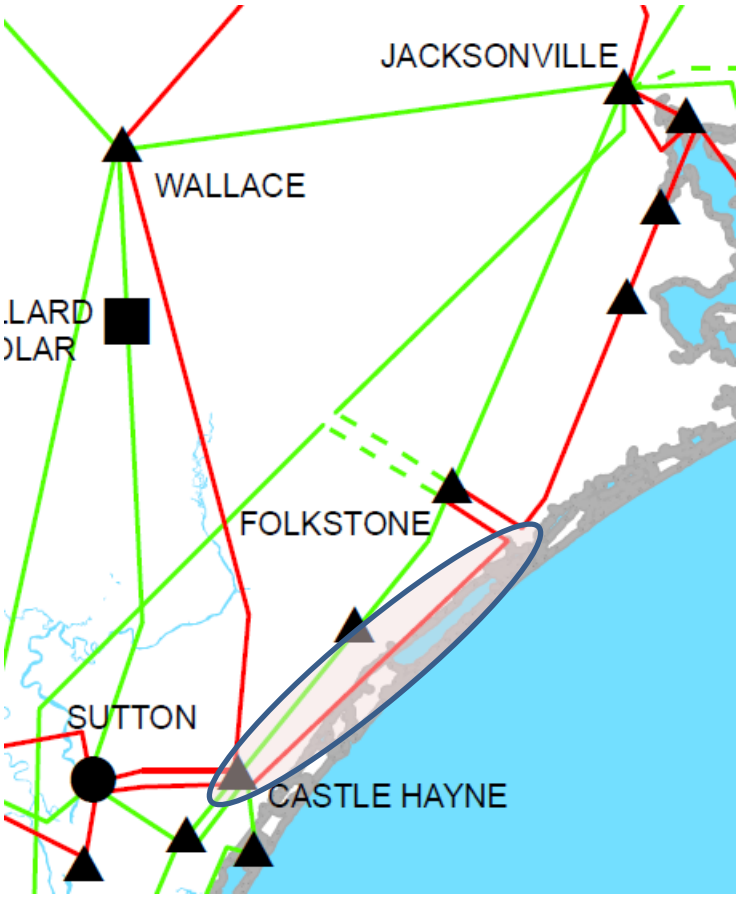
Narrative Description of the Need for this Project
By winter 2026/27, an outage of the Castle Hayne – Folkstone 230 kV line will cause the Castle Hayne 230 kV Sub-Folkstone 115 kV line to overload. This project will mitigate the overload problem.

Other Transmission Solutions Considered
New 230 kV transmission lines.

Why this Project was Selected as the Preferred Solution
The cost and construction feasibility are much better with selected alternative.

Castle Hayne–Folkstone 115 kV Line, Rebuild

- **NERC Category P1 violation**
- **Problem:** By winter 2026/27, an outage of the Castle Hayne–Folkstone 230 kV line will cause the Castle Hayne 230 kV Sub-Folkstone 115 kV line to overload. This project will mitigate the overload problem.
- **Solution:** Rebuild approximately 25.91 miles of 115 kV line (Castle Hayne 230 kV Sub to structure #251) with 1272 MCM ACSR or equivalent.



Project ID and Name: 0057 – Holly Ridge North 115 kV Switching Station, Construct

Project Description
Construct a new 115 kV Switching Station northeast of Holly Ridge, NC where the Castle Hayne–Folkstone 115 kV and Folkstone–Jacksonville City 115 kV lines come together. Construct a new 115 kV feeder from the new switching station to Jones–Onslow EMC Folkstone POD.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	12/1/2026
Estimated Time to Complete	3 years
Estimated Cost	$12 M

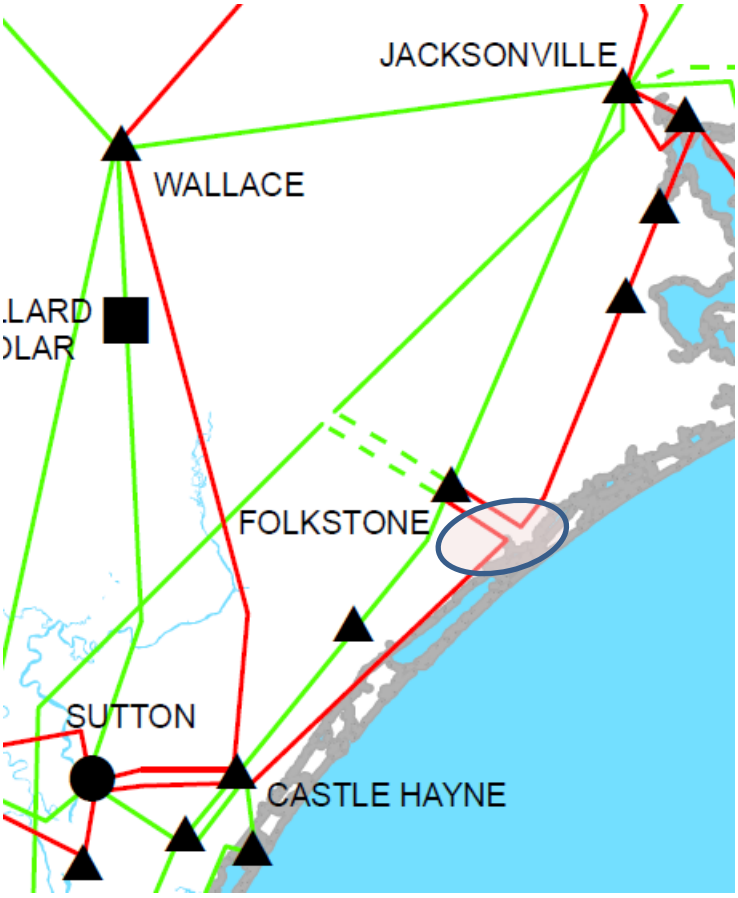
Narrative Description of the Need for this Project
By winter 2026-27, the NERC P2-1 opening of the Folkstone end of the Castle Hayne–Folkstone 115 kV line results in low voltages at stations on this line.

Other Transmission Solutions Considered
New 230 kV transmission lines.

Why this Project was Selected as the Preferred Solution
The cost and construction feasibility are much better with selected alternative.

Holly Ridge North 115 kV Switching Station, Construct

- **NERC Category P2-1 violation**
- **Problem:** By winter 2026-27, the NERC P2-1 opening of the Folkstone end of the Castle Hayne – Folkstone 115 kV line results in low voltages at stations on this line.
- **Solution:** Construct new 115 kV switching station northeast of Holly Ridge.



Project ID and Name: 0058 – Coronaca 100 kV Line (Coronaca-Creto), Upgrade and Construct

Project Description
This project consists of rebuilding 8.9 miles of the existing 477 ACSR conductor with 954 ACSR and adding a second 954 ACSR circuit.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	6/1/26
Estimated Time to Complete	2.5 years
Estimated Cost	$38 M

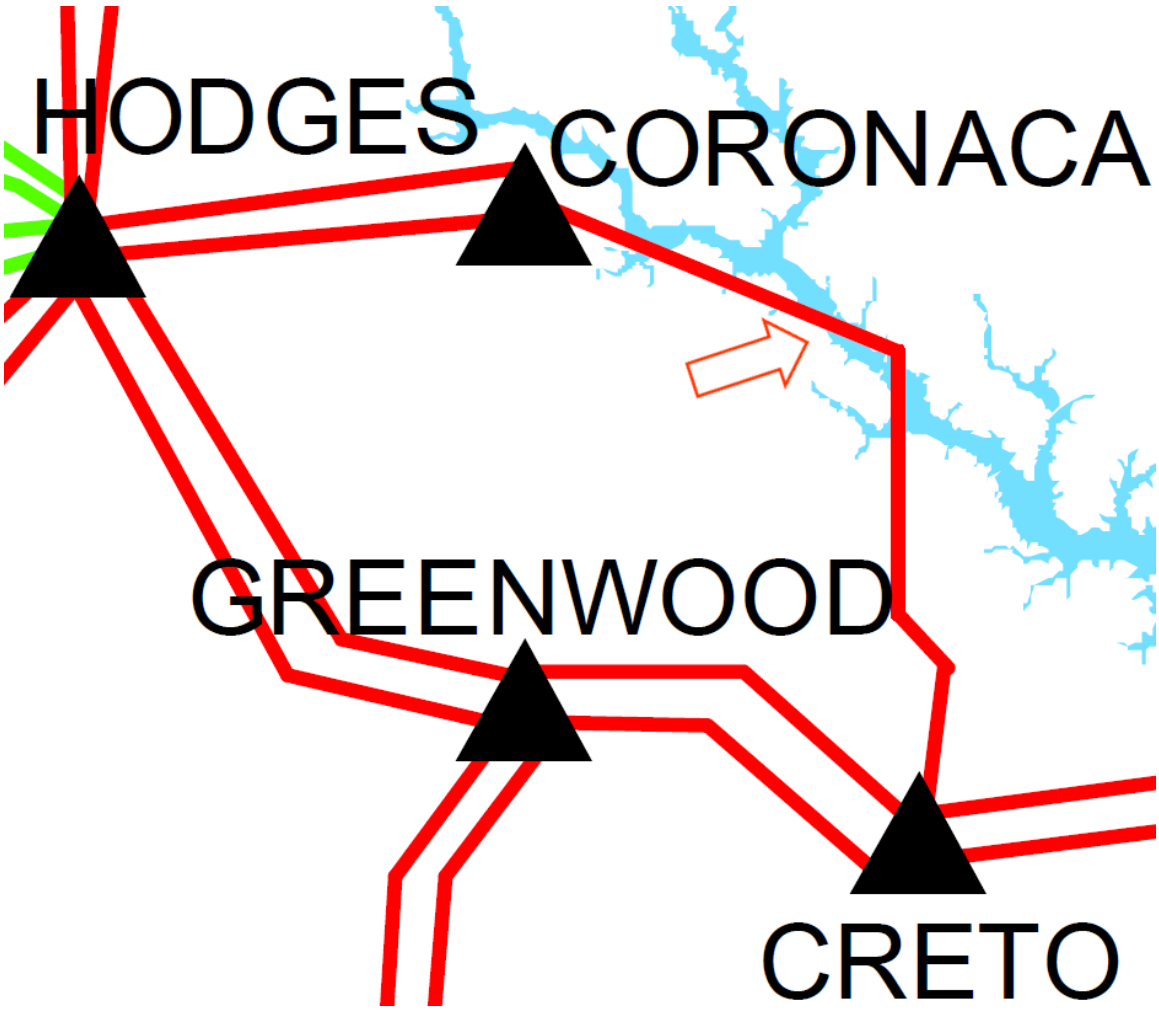
Narrative Description of the Need for this Project
These lines may become overloaded for loss of both Coronaca-Hodges 100 kV circuits.

Other Transmission Solutions Considered
New transmission line(s).

Why this Project was Selected as the Preferred Solution
New transmission line(s) would require additional right-of-way, adding to the cost of the project.

Coronaca 100 kV Line (Coronaca-Creto), Upgrade and Construct

- **NERC Category P6 & P7 violation**
- **Problem:** Loss of both Coronaca-Hodges 100 kV lines may overload the Coronaca-Creto line.
- **Solution:** Rebuild 100 kV lines with higher capacity conductors and add second circuit.



Project ID and Name: 0059 – Monroe 100 kV Line (Lancaster-Monroe), Upgrade

Project Description
This project consists of rebuilding 23.8 miles of the existing 2/0 Cu conductor with 1158 ACSS/TW.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	12/1/27
Estimated Time to Complete	4 years
Estimated Cost	$73 M

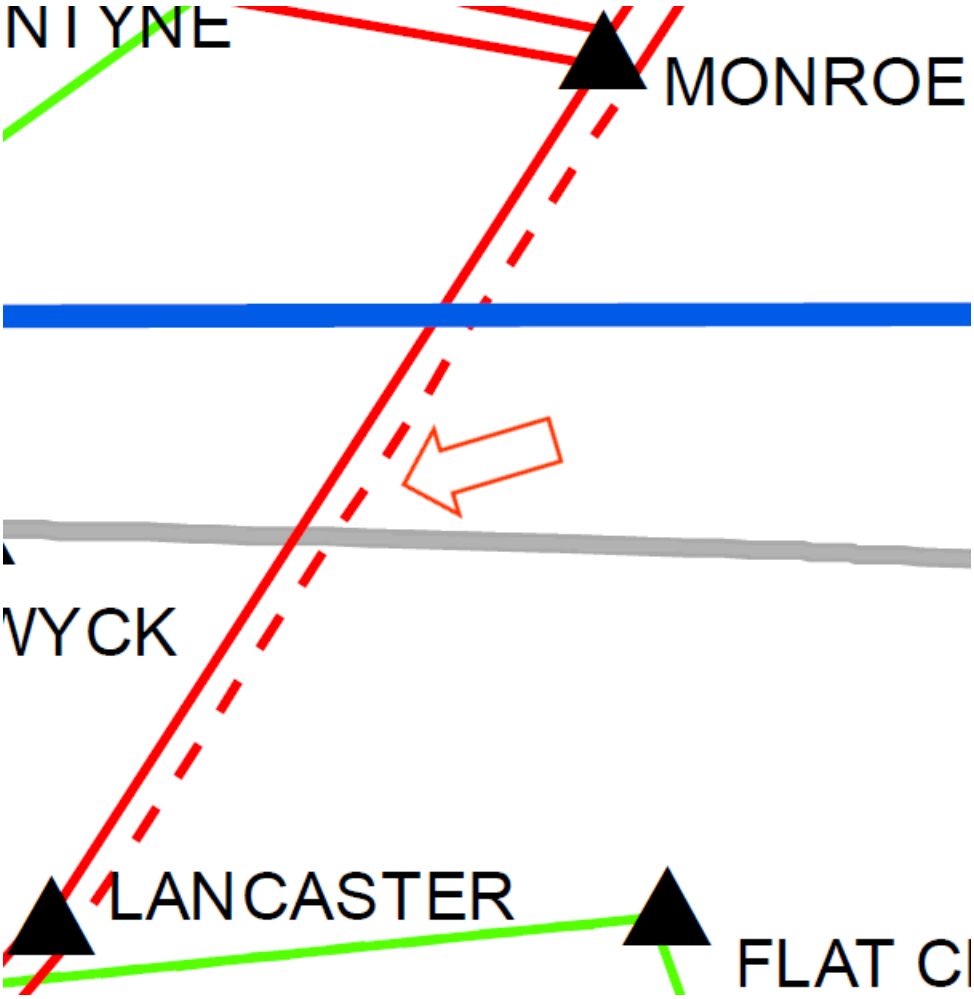
Narrative Description of the Need for this Project
These lines may become overloaded for loss of one of the circuits.

Other Transmission Solutions Considered
New transmission line(s) into Monroe Main.

Why this Project was Selected as the Preferred Solution
New transmission line(s) would require additional right-of-way, adding to the cost of the project.

Monroe 100 kV Line (Lancaster-Monroe), Upgrade

- **NERC Category P3 violation**
- **Problem:** Loss of one of the Lancaster-Monroe 100 kV lines (black circuit) may overload the remaining line (white circuit). Loss of a transformer at Morning Star may also overload existing 100 kV lines.
- **Solution:** Rebuild 100 kV lines with higher capacity conductors.



Project ID and Name: 0060 – Westport 230 kV Line (McGuire-Marshall), Upgrade

Project Description
This project consists of rebuilding 13.8 miles of the existing 1272 ACSR conductor with 1533 ACSS/TW.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	4.5 years
Estimated Cost	$43 M

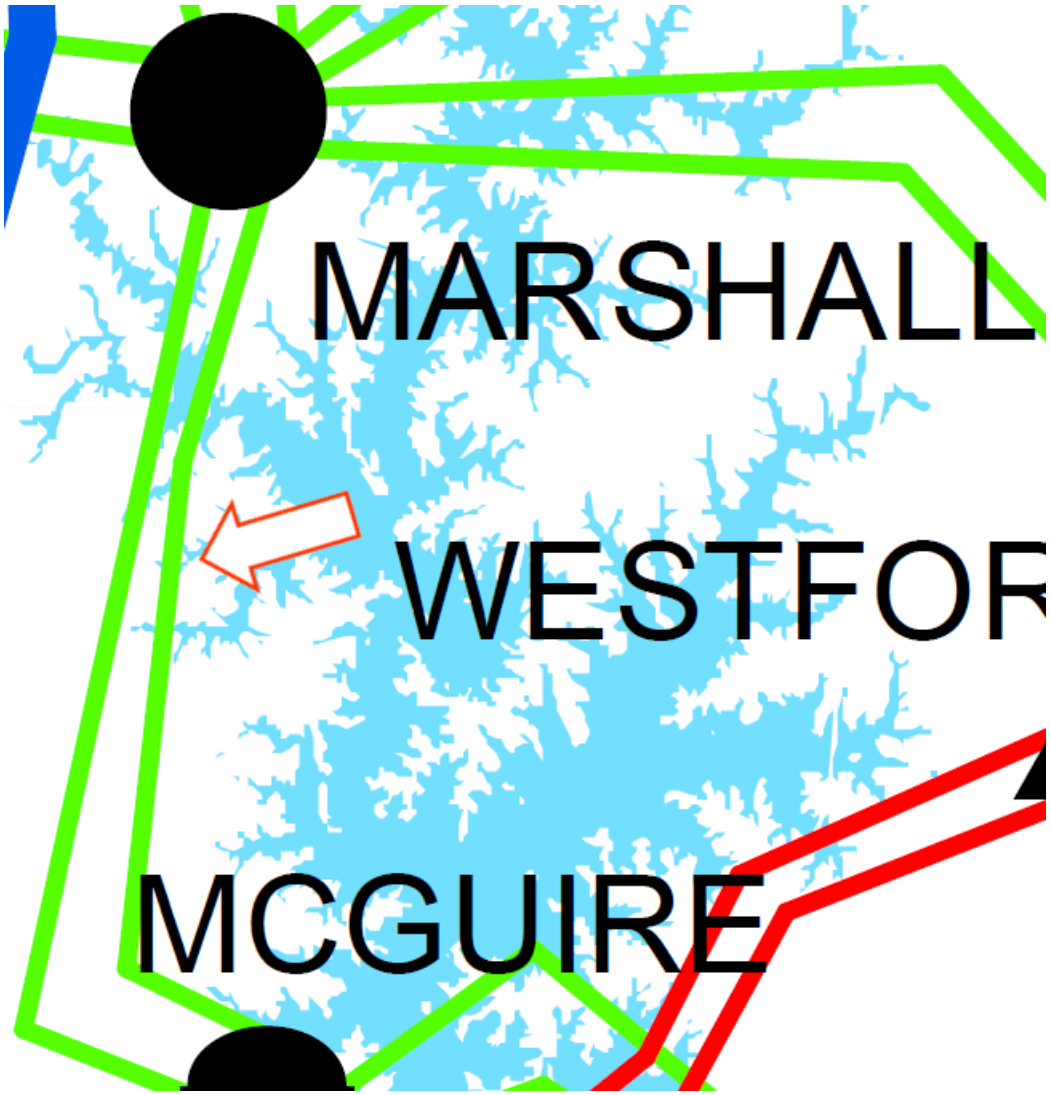
Narrative Description of the Need for this Project
These lines may become overloaded for loss of one of the circuits.

Other Transmission Solutions Considered
Series line reactors.

Why this Project was Selected as the Preferred Solution
Line reactors would drive the upgrade of a different, longer set of 230 kV lines.

Westport 230 kV Line (McGuire-Marshall), Upgrade

- **NERC Category P3 violation**
- **Problem:** Loss of one of the McGuire-Marshall 230 kV lines may overload the remaining line.
- **Solution:** Rebuild 230 kV lines with higher capacity conductors.



Project ID and Name: 0061 – Wateree 100 kV Line (Great Falls-Wateree), Upgrade

Project Description
This project consists of six-wiring 19.8 miles of the existing 2/0 Cu conductor.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	6/1/2024
Estimated Time to Complete	0.5 years
Estimated Cost	$11 M

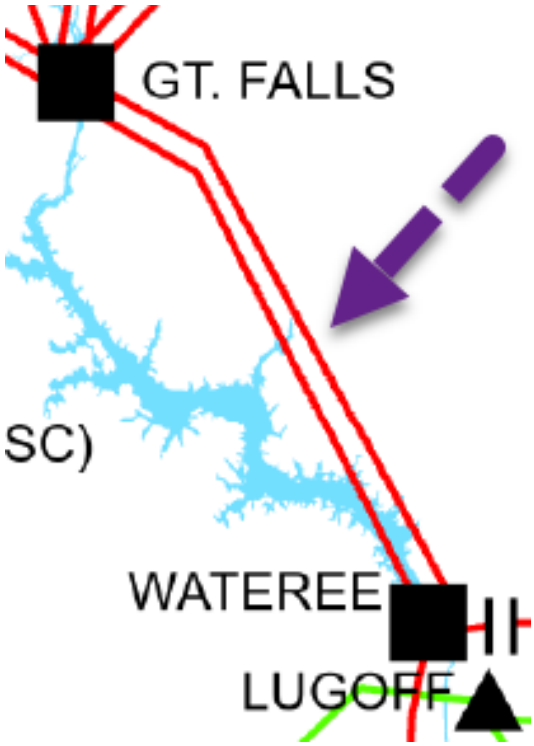
Narrative Description of the Need for this Project
The loss of either circuit can overload the remaining circuit.

Other Transmission Solutions Considered
Rebuild 19.8 miles of double circuit 100 kV. New transmission line(s).

Why this Project was Selected as the Preferred Solution
Cost and difficulty of rebuilding the existing double circuit 100 kV line. Quickest, low-cost option to resolve DEC/DEP local issues around Wateree.

Wateree 100 kV Line (Great Falls-Wateree), Upgrade

- **NERC Category P2/P3/P5/P7 violation**
- **Problem:** The loss of either circuit can overload the remaining the circuit.
- **Solution:** Six-wire existing double circuit 100 kV line.



Project ID and Name: 0062 – Silas 100 kV Line (Mocksville-Idols Tap), Upgrade

Project Description
This project consists of rebuilding 11.4 miles of the existing 2/0 Cu and 477 ACSR conductor with 1272 ACSR.

Status	In-service
Transmission Owner	DEC
Planned In-Service Date	6/13/2023
Estimated Time to Complete	-
Estimated Cost	$24 M

Narrative Description of the Need for this Project
This line may become overloaded for various contingencies involving facilities on the path between Stamey Tie and Winston Tie.

Other Transmission Solutions Considered
New transmission line. Dropping load.

Why this Project was Selected as the Preferred Solution
Replaces aging transmission infrastructure and provides additional transmission capacity in area at a lower cost than constructing additional facilities.

Silas 100 kV Line (Mocksville-Idols Tap), Upgrade

- **NERC Category P2/P4/P5/P6/P7 violation**
- **Problem:** This line may become overloaded for various local transmission contingencies.
- **Solution:** Rebuild 100 kV line with higher capacity conductors.

Project ID and Name: 0063 – North Greenville 230 kV Tie Station, Upgrade

Project Description
This project consists of installing a 230 kV series bus junction breaker, replacing 10 breakers, replacing a 230/100/44 kV transformer, and upgrading ancillary equipment on a local 100 kV line.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	12/1/2025
Estimated Time to Complete	2 years
Estimated Cost	$23 M

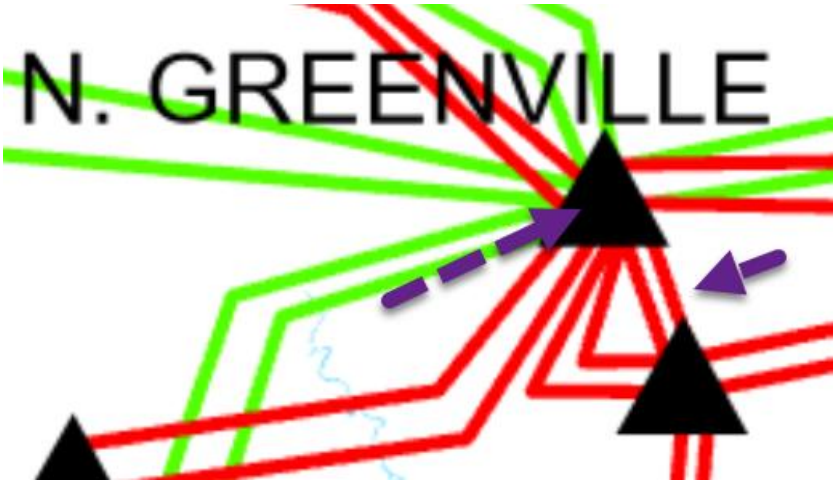
Narrative Description of the Need for this Project
Primarily Asset Management driven upgrades to address aging infrastructure, with some of the breaker replacements and the bus junction breaker installation being driven by TPL

Other Transmission Solutions Considered
Upgrading multiple transmission lines that may overload under contingency. Reacting to equipment failure versus proactively replacing breakers due to condition.

Why this Project was Selected as the Preferred Solution
Cost, reliability, and safety.

North Greenville 230 kV Tie Station, Upgrade

- **NERC Category P5 violation**
- **Problem:** Asset Management identified the need to replace transmission equipment, and TPL studies indicated lines that may overload under contingency.
- **Solution:** This project consists of installing a 230 kV series bus junction breaker, replacing 10 breakers, replacing a 230/100/44 kV transformer, and upgrading ancillary equipment on a local 100 kV line.



Project ID and Name: 0064 – Wylie 100 kV Line (Wylie-Arrowood Retail), Upgrade

Project Description
This project consists of rebuilding 7.9 miles of the existing 477 ACSR conductor with B-477 ACSR.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	12/1/2026
Estimated Time to Complete	3 years
Estimated Cost	$15 M

Narrative Description of the Need for this Project
This line may become overloaded for various local transmission contingencies.

Other Transmission Solutions Considered
Dropping load

Why this Project was Selected as the Preferred Solution
Reliability

Wylie 100 kV Line (Wylie-Arrowood Retail), Upgrade

- **NERC Category P2/P3/P4/P5/P6 violation**
- **Problem:** Local transmission contingencies involving facilities associated with Allen Steam Station, Newport Tie and/or Woodlawn Tie may overload this line.
- **Solution:** Rebuild 100 kV lines with higher capacity conductors.

Project ID and Name: 0065 – Morning Star 230 kV Tie Station, Upgrade

Project Description
This project consists of replacing (3) 230/100 kV transformers and converting the station to breaker-and-a-half.

Status	Planned
Transmission Owner	DEC
Planned In-Service Date	12/1/2032
Estimated Time to Complete	4 years
Estimated Cost	$38 M

Narrative Description of the Need for this Project
The transformers can become overloaded for various contingencies involving facilities associated with Morning Star Tie Station.

Other Transmission Solutions Considered
Dropping load. Add 4th 230/100 transformer.

Why this Project was Selected as the Preferred Solution
Reliability. Age of existing transformers.

Morning Star 230 kV Tie Station, Upgrade

- **NERC Category P2/P4/P6 violation**
- **Problem:** Various contingencies involving facilities at Morning Star Tie Station may cause one or more of the transformers to become overloaded.
- **Solution:** Replace existing 230/100/44 kV transformers with larger transformers and convert the station to breaker-and-a-half.

Project ID and Name: 0066 – Davidson River 100 kV Line (North Greenville-Marietta), Upgrade

Project Description
This project consists of rebuilding 11.5 miles of the existing 250 Cu / 477 ACSR conductor with 1272 ACSR.

Status	Planned
Transmission Owner	DEC
Planned In-Service Date	12/1/2030
Estimated Time to Complete	4 years
Estimated Cost	$17 M

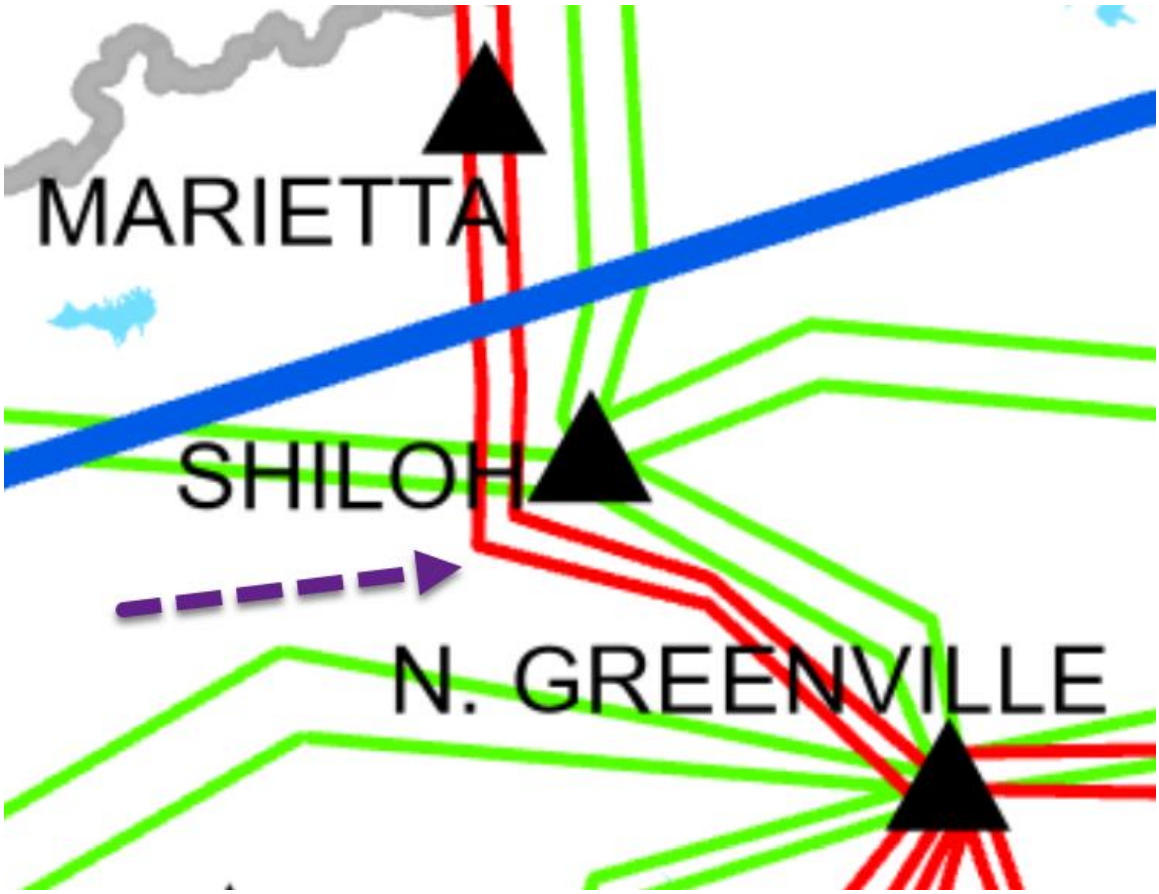
Narrative Description of the Need for this Project
This line may become overloaded for contingencies involving facilities associated with Shiloh Switching Station.

Other Transmission Solutions Considered
Dropping load. Curtailing transfers to CPLW.

Why this Project was Selected as the Preferred Solution
Reliability

Davidson River 100 kV Line (North Greenville-Marietta), Upgrade

- **NERC Category P5/P6/P7 violation**
- **Problem:** This line may become overloaded due to contingencies of facilities associated with Shiloh Switching Station.
- **Solution:** Rebuild 100 kV line with higher capacity conductors.



Project ID and Name: 0067 – Harley 100 kV Line (Tiger-Campobello), Upgrade

Project Description
This project consists of rebuilding 11.8 miles of the existing 336 ACSR conductor with 1272 ACSR.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	4 years
Estimated Cost	$45 M

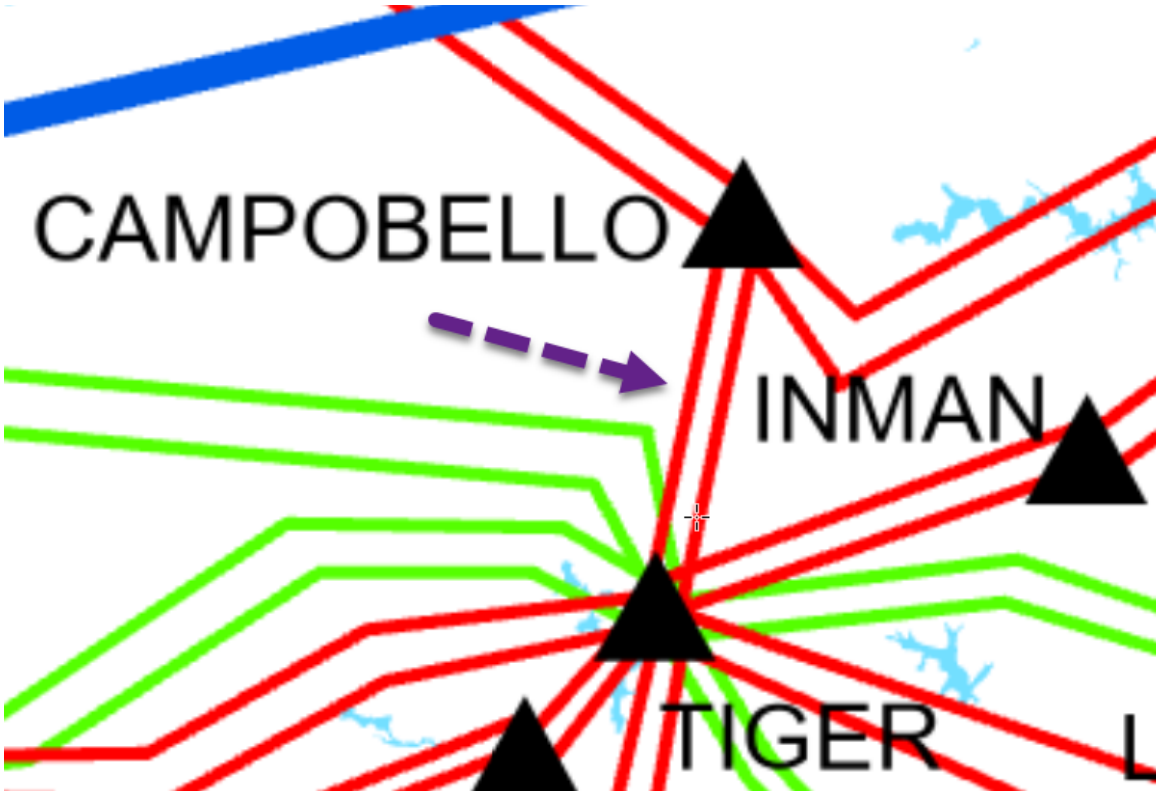
Narrative Description of the Need for this Project
This line may become overloaded for local contingencies.

Other Transmission Solutions Considered
New tie station

Why this Project was Selected as the Preferred Solution
Lower cost and increased capacity on older transmission facility.

Harley 100 kV Line (Tiger-Campobello), Upgrade

- **NERC Category P2/P3/P6/P7 violation**
- **Problem:** Loss of local transmission facilities may overload the 100 kV line.
- **Solution:** Rebuild 100 kV line with higher capacity conductors.



Project ID and Name: 0068 – Sandy Ridge 230 kV Line (Newport-Morning Star), Upgrade

Project Description
This project consists of adding a second circuit to a 33.6 mile 230 kV line and several associated projects needed to accommodate the circuit addition.

Status	Planned
Transmission Owner	DEC
Planned In-Service Date	12/1/29
Estimated Time to Complete	6 years
Estimated Cost	$34 M

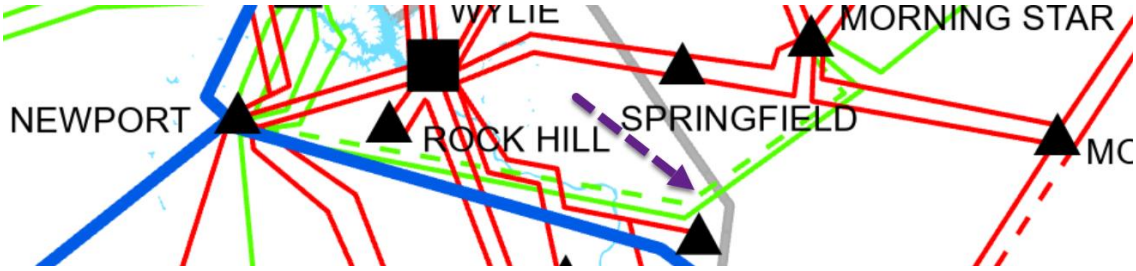
Narrative Description of the Need for this Project
This line may become overloaded for loss of a 500 kV tie line between DEC and DEP or other local contingencies.

Other Transmission Solutions Considered
Upgrade existing 230 kV circuit. Line reactors.

Why this Project was Selected as the Preferred Solution
Utilization of existing 230 kV corridor increases transmission capacity and ability to reliably serve local load. Capability of existing structures to support a second 230 kV circuit.

Sandy Ridge 230 kV Line (Newport-Morning Star), Upgrade

- **NERC Category P1/P2/P3/P6/P7 violation**
- **Problem:** Loss of local transmission facilities may overload the existing 230 kV circuit
- **Solution:** Add second 230 kV circuit between Newport and Morning Star.



Project ID and Name: 0069 – Skybrook 100 kV Line (Winecoff-Eastfield Retail), Upgrade

Project Description
This project consists of rebuilding 7.9 miles of the existing 477 ACSR conductor with 1272 ACSR.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	4 years
Estimated Cost	$15 M

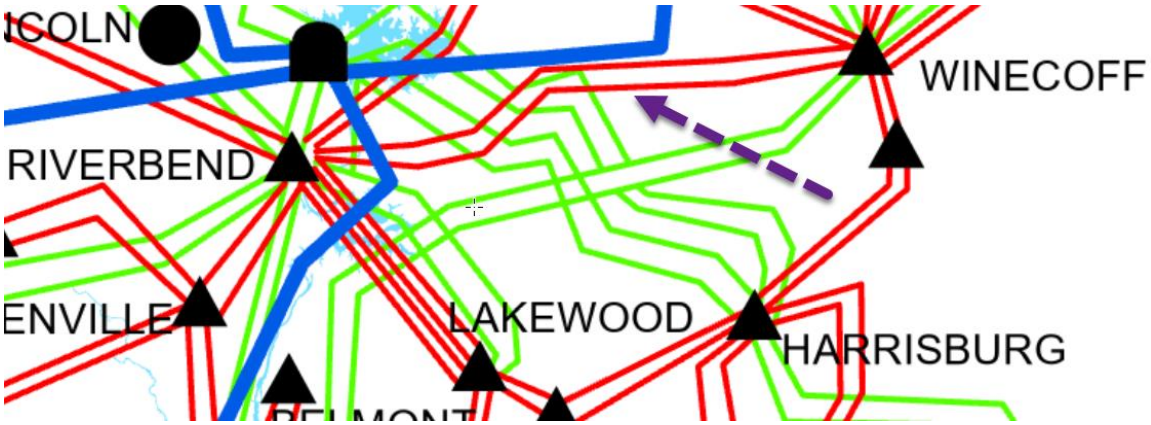
Narrative Description of the Need for this Project
This line may become overloaded for local contingencies.

Other Transmission Solutions Considered
Dropping load.

Why this Project was Selected as the Preferred Solution
Reliability

Skybrook 100 kV Line (Winecoff-Eastfield Retail), Upgrade

- **NERC Category P6/P7 violation**
- **Problem:** Loss of local transmission facilities may overload this line
- **Solution:** Rebuild 100 kV line with higher capacity conductors.



Project ID and Name: 0086 – Parkwood Tie 500/230 kV Bank 5, Replace

Project Description
Replace 500/230 kV bank with 1680 MVA bank

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	12/1/24
Estimated Time to Complete	1 year
Estimated Cost	$42 M

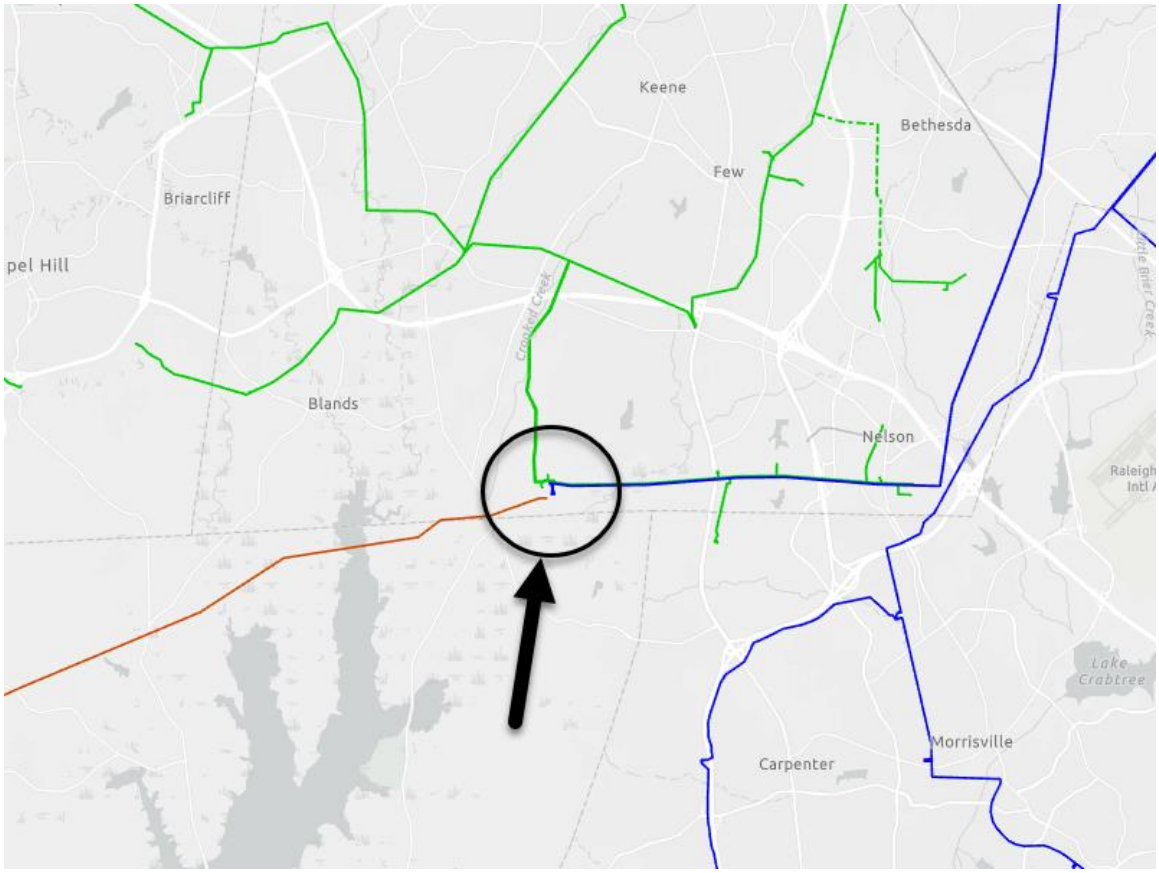
Narrative Description of the Need for this Project
Failure of one of the existing phases

Other Transmission Solutions Considered
Replace failed phase

Why this Project was Selected as the Preferred Solution
Helped with standardization of spare phases. Improved contingency thermal violations.

Parkwood Tie 500/230 kV Bank 5, Replace

- **Asset Management**
- **Problem:** One of the phases on the existing bank failed
- **Solution:** Replace 500/230 kV bank



Project ID and Name: 0087 – Breaker Station on Motley 100 kV Line for New Customer, Construct

Project Description
Add 4 mile 100 kV tap line from Motley Bl 100 kV line to new Customer substation.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	6/1/25
Estimated Time to Complete	1.5 years
Estimated Cost	$12 M

Narrative Description of the Need for this Project
Project is needed to serve new load customer.

Other Transmission Solutions Considered
Tapping the Dan River-Ridgeway 138 kV tie line

Why this Project was Selected as the Preferred Solution
Avoided scope and schedule impacts caused by needing to change the tie line metering

Breaker Station on Motley 100 kV Line for New Customer, Construct

- **New Load**
- **Solution:** Construct 4 miles of new transmission line to new Customer substation.

Project ID and Name: 0088 – Island Creek 44 kV, Conversion

Project Description
Rebuild Island Creek 44 kV as double circuit 100 kV line (477 ACSS/TW) and replace or install (6) 100 kV breakers at Oakboro Tie.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	6/1/25
Estimated Time to Complete	1.5 years
Estimated Cost	$15 M

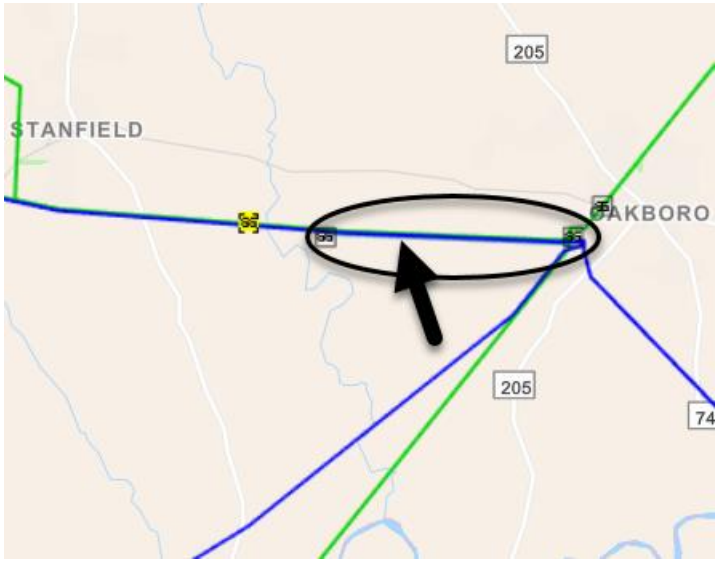
Narrative Description of the Need for this Project
Project is needed to serve Union EMC load from 100 kV instead of 44 kV

Other Transmission Solutions Considered
Serving new delivery from Rocky River 100 kV line (Monroe-Oakboro)

Why this Project was Selected as the Preferred Solution
Greater load serving capability in local area. Defer upgrades to other transmission in the area.

Island Creek 44 kV, Conversion

- **New load**
- **Solution:** Convert ≈2.5 miles of existing transmission line from 44 kV to 100 kV, and replace or install (6) 100 kV breakers at Oakboro Tie.



Project ID and Name: 0089 – McDowell Tie Bank 2, Replace

Project Description
Replace bank 2 (230/100/44 kV) with 448 MVA bank

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	6/1/25
Estimated Time to Complete	1.5 years
Estimated Cost	$12 M

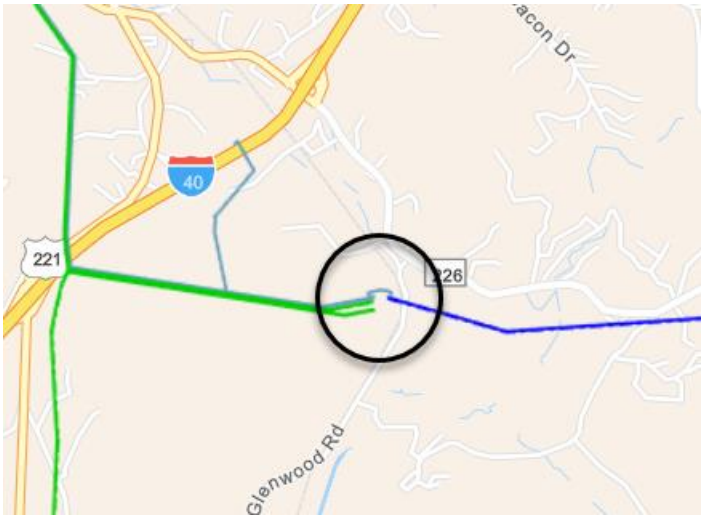
Narrative Description of the Need for this Project
Asset Management

Other Transmission Solutions Considered
Transformer is approaching its end of life, so no other option than to replace.

Why this Project was Selected as the Preferred Solution
Transformer is approaching its end of life. 448 MVA is a standard size, which helps with standardization of transformers.

McDowell Tie 230/100 kV Bank 2, Replace

- **Asset Management**
- **Problem:** Transformer is approaching end of life
- **Solution:** Replace transformer



Project ID and Name: 0090 – Boyd Switching Station, Construct

Project Description
Construct new switching station on Oliver B/W 230 kV (Marshall-Longview). Post-construction nomenclature of lines becomes Oliver B/W 230 kV (Boyd-Marshall) and Brookford B/W 230 kV (Boyd-Longview).

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	6/1/26
Estimated Time to Complete	2.5 years
Estimated Cost	$42 M

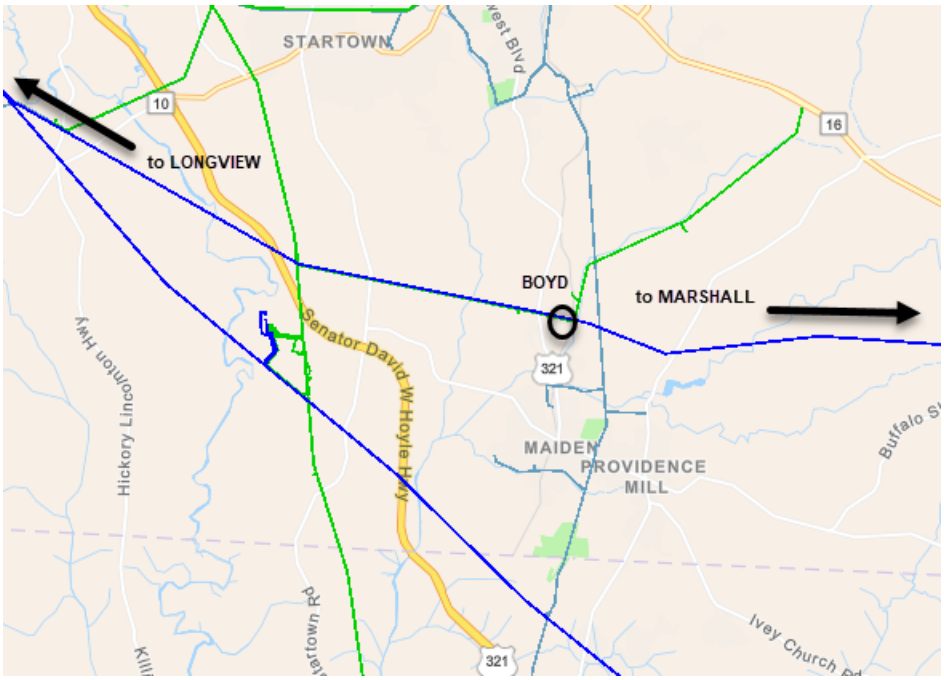
Narrative Description of the Need for this Project
Station is needed to serve new load customer.

Other Transmission Solutions Considered
Size and location of the customer request, necessitated a switching station solution for their delivery

Why this Project was Selected as the Preferred Solution
The size of the customer request (≥ 120 MW) required a switching station solution

Boyd Switching Station, Construct

- **New load**
- **Solution:** Construct new 230 kV switching station on Oliver B/W 230 kV line (Marshall-Longview).



Project ID and Name: 0091 – Haas Creek Switching Station, Construct

Project Description
Construct new switching station on Blackburn B/W 230 kV (Orchard-Longview). Post-construction nomenclature of lines becomes Blackburn B/W 230 kV (Haas Creek-Orchard) and Hildebran B/W 230 kV (Haas Creek-Longview).

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	6/1/26
Estimated Time to Complete	2.5 years
Estimated Cost	$44 M

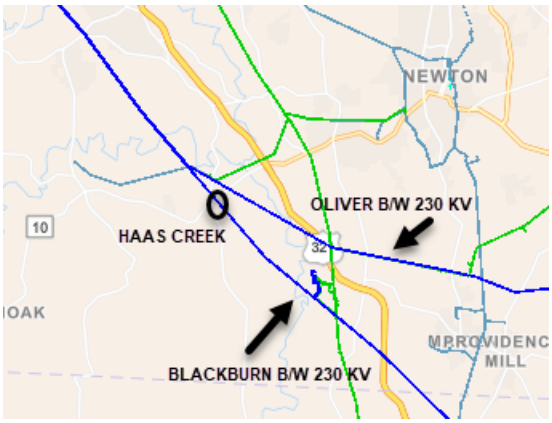
Narrative Description of the Need for this Project
Station is needed to serve new load customer.

Other Transmission Solutions Considered
Size and location of the customer request, necessitated a switching station solution for their delivery

Why this Project was Selected as the Preferred Solution
The size of the customer request (≥ 120 MW) required a switching station solution

Haas Creek Switching Station, Construct

- **New load**
- **Solution:** Construct new 230 kV switching station on Oliver B/W 230 kV line (Marshall-Longview).



Project ID and Name: 0092 – Lyle Creek Switching Station, Construct

Project Description
Construct new switching station on Hickory B/W 100 kV (Hickory-Lookout). Post-construction nomenclature of lines becomes Hickory B/W 100 kV (Lyle Creek-Hickory) and Lookout B/W 100 kV (Lyle Creek-Lookout).

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	6/1/26
Estimated Time to Complete	2.5 years
Estimated Cost	$53 M

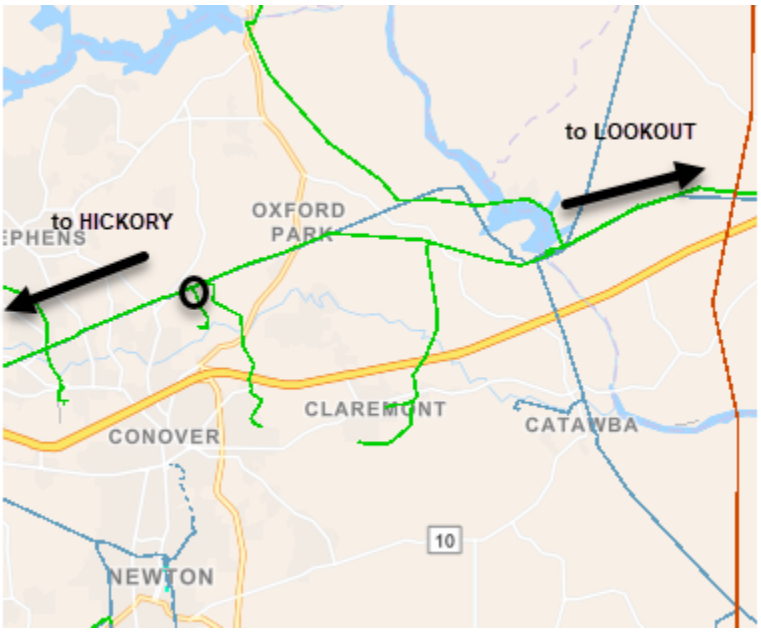
Narrative Description of the Need for this Project
Station is needed to serve new load customer.

Other Transmission Solutions Considered
Size and location of the customer request, necessitated a switching station solution for their delivery

Why this Project was Selected as the Preferred Solution
The size of the customer request (≥ 120 MW) required a switching station solution

Lyle Creek Switching Station, Construct

- **New load**
- **Solution:** Add second 230 kV circuit between Newport and Morning Star.



Project ID and Name: 0093 – Page and Guilford 100 kV Lines (Greensboro-North Greensboro), Upgrade

Project Description
Upgrade 4 miles (Greensboro-N Greensboro) to 1158 ACSS/TW. Project includes upgrade of both double circuit transmission lines between the two stations.

Status	Planned
Transmission Owner	DEC
Planned In-Service Date	12/1/26
Estimated Time to Complete	3 years
Estimated Cost	$17 M

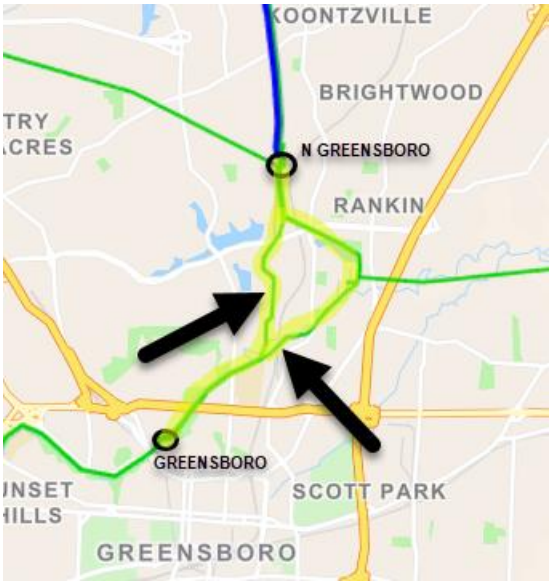
Narrative Description of the Need for this Project
Breaker and bus contingencies result in loss of 2 of the 4 circuits between North Greensboro and Greensboro Main, which can cause the remaining circuits to overload.

Other Transmission Solutions Considered
Dropping load

Why this Project was Selected as the Preferred Solution
Undesirable loadshed

Page and Guilford 100 kV Lines (Greensboro-North Greensboro), Upgrade

- **NERC Category P2/P4/P6/P7 violation**
- **Problem:** Contingencies at Greensboro or N Greensboro (or involving the transmission lines between those stations) can cause the remaining circuits between the two stations to overload.
- **Solution:** Upgrade both existing transmission lines from 954 ACSR to 1158 ACSS/TW.



Project ID and Name: 0094 – Cabarrus 100 kV Line (Wildcat-Westfork), Upgrade

Project Description
Upgrade 3.1 miles of existing transmission line to 1272 ACSR.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	3 years
Estimated Cost	$13 M

Narrative Description of the Need for this Project
Loss of a parallel circuit on the Stonewater Tie - Westfork Switching Station can cause the remaining circuit to overload.

Other Transmission Solutions Considered
Dropping load

Why this Project was Selected as the Preferred Solution
Undesirable load shed

Cabarrus 100 kV Line (Wildcat-Westfork), Upgrade

- **NERC Category P2/P4 violation**
- **Problem:** Loss of either circuit can overload the remaining circuit.
- **Solution:** Upgrade 3.1 miles of existing transmission line from 477 ACSR to 1272 ACSR.

Project ID and Name: 0095 – Sevier 100 kV Line (East Greenville-Verdae Retail Tap), Upgrade

Project Description
Upgrade 4.5 miles of existing transmission line to 795 ACSS/TW.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	12/1/26
Estimated Time to Complete	3 years
Estimated Cost	$20 M

Narrative Description of the Need for this Project
Loss of the Shady Grove Tie - Oakvale Tie 100 kV transmission lines can overload the Oakvale Tie - East Greenville Tie 100 kV Transmission Lines

Other Transmission Solutions Considered
Dropping load. Storage.

Why this Project was Selected as the Preferred Solution
Increased reliability and cost.

Sevier 100 kV Line (East Greenville-Verdae Retail Tap), Upgrade

- **NERC Category P6 violation**
- **Problem:** Loss of double circuit line between Shady Grove and Oakvale can overload the E Greenville-Verdae Retail Tap section of the Sevier 100 kV line.
- **Solution:** Upgrade 4.9 miles of existing transmission line from 477 ACSR to 795 ACSS/TW.

Project ID and Name: 0096 – Panther 100 kV Line (EMC Corp-Stallings Rd Retail), Network

Project Description
Add 8.75 mile of new 100 kV transmission (1272 ACSR) between Stallings Rd Ret and EMC Corp and re-terminate Stallings Rd Ret tap to E Durham Tie.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	4 years
Estimated Cost	$56 M

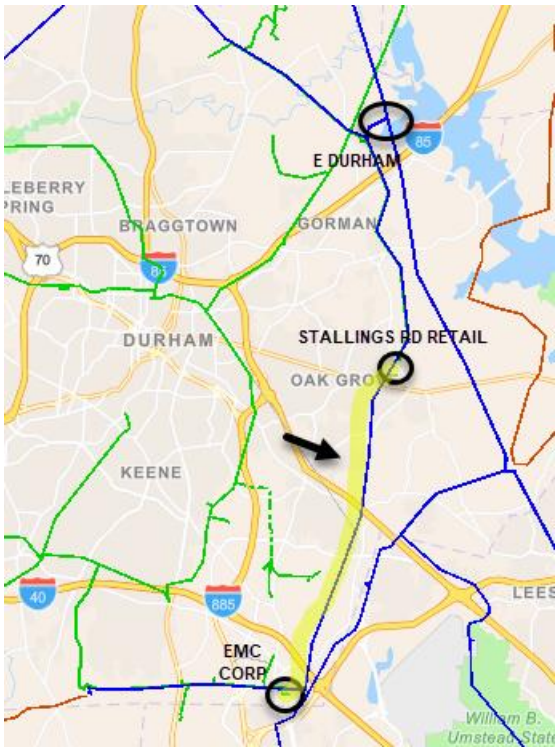
Narrative Description of the Need for this Project
The present radial configuration of the Panther 100 kV line increases exposure to outages for customers served from that line.

Other Transmission Solutions Considered
Adding a new 230/100 kV bank at E Durham Tie and adding 230 kV bus differential redundancy resolves different local issues but would not address the reliability concerns on the Panther 100 kV line.

Why this Project was Selected as the Preferred Solution
Addresses reliability concerns on the radial Panther 100 kV line. Delays the need for upgrades on other facilities at Parkwood Tie.

Panther 100 kV Line (EMC Corp-Stallings Rd Retail), Network

- **NERC Category P5 violation, DEC Transmission Planning Practices**
- **Problem:** Reliability concerns on radial Panther 100 kV line.
- **Solution:** Network Panther 100 kV line by constructing 8.75 miles of new transmission between Stallings Rd Ret and EMC Corp and re-terminating Stallings Rd Retail to E Durham Tie.



Project ID and Name: 0097 – Dan River 100 kV Line (Dan River-North Greensboro), Upgrade

Project Description
Upgrade 25.9 miles of existing transmission to 1272 ACSR.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	5 years
Estimated Cost	$87 M

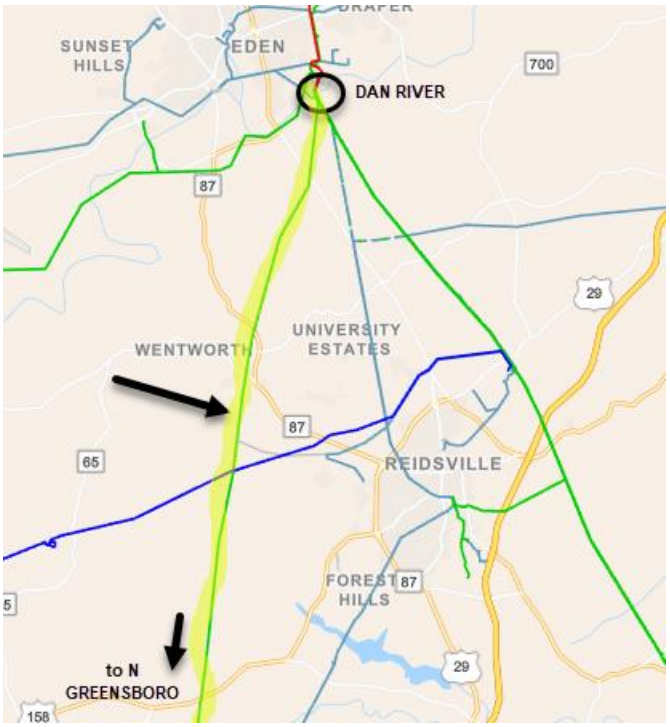
Narrative Description of the Need for this Project
Breaker and bus faults at Dan River Steam can cause the Dan River Steam - North Greensboro Tie 100 kV Transmission Lines to overload

Other Transmission Solutions Considered
Bring 230 kV into Dan River.

Why this Project was Selected as the Preferred Solution
230 kV solution would introduce significant cost due to needing new 230 kV right of way, 230 kV line, and construction of a tie station.

Dan River 100 kV Line (Dan River-North Greensboro), Upgrade

- **NERC Category P2/P4/P6/P7 violation**
- **Problem:** Contingencies around Dan River Steam can cause these circuits to overload.
- **Solution:** Upgrade 25.9 miles of existing transmission line from 336 ACSR to 1272 ACSR.



Project ID and Name: 0098 – Oliver 230 kV Line (Marshall-Boyd), Upgrade

Project Description
Upgrade 15 miles of existing 230 kV transmission between Marshall and Boyd (a new switching station) to B-1272 ACSR.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	5 years
Estimated Cost	$60 M

Narrative Description of the Need for this Project
As load increases at Boyd, Haas Creek, and Lyle Creek, these lines may become overloaded.

Other Transmission Solutions Considered
New 230 kV line between Wilkes Tie and Caldwell County / Convert Baton B/W 100 kV to 230 kV New 230 kV line between Cliffside Tie and Longview Tie New 230 kV line between Ashville (DEP) and McDowell Tie

Why this Project was Selected as the Preferred Solution
Least costly option. Most likely to meet the customer timeline, Least impact on landowners in the region

Oliver 230 kV Line (Marshall-Boyd), Upgrade

- **NERC Category P6/P7 violation**
- **Problem:** Line may overload as load increases at surrounding stations (Boyd, Haas Creek, Lyle Creek).
- **Solution:** Upgrade 15 miles of existing transmission line from 1272 ACSR to B-1272 ACSR.

Project ID and Name: 0099 – Reidsville and Wolf Creek 100 kV Lines (Dan River-Sadler), Upgrade

Project Description
Upgrade 8.2 miles (per line) of existing transmission to 1272 ACSR. Project includes upgrade of both double circuit transmission lines between Dan River and Sadler.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	5 years
Estimated Cost	$37 M

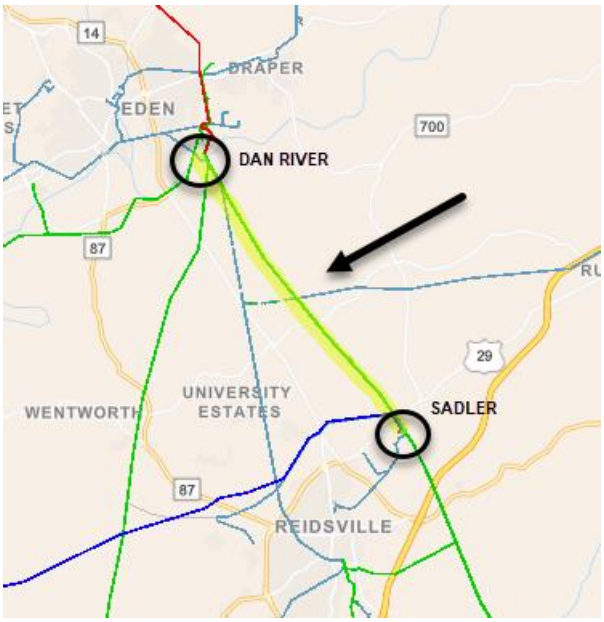
Narrative Description of the Need for this Project
Bus and breaker faults at Dan River may overload these lines.

Other Transmission Solutions Considered
Bring 230 kV into Dan River.

Why this Project was Selected as the Preferred Solution
230 kV solution would introduce significant cost due to needing new 230 kV right of way, 230 kV line, and construction of a tie station.

Reidsville and Wolf Creek 100 kV Lines (Dan River-Sadler), Upgrade

- **NERC Category P2/P4 violation**
- **Problem:** Contingencies around Dan River Steam can cause these circuits to overload.
- **Solution:** Upgrade both existing transmission lines from 336 ACSR to 1272 ACSR.



Project ID and Name: 0100 – Beulah 100 kV Line (Lookout-EnergyUnited Del 18), Upgrade

Project Description
Upgrade 5.5 miles of existing transmission to 1272 ACSR.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	3.5 years
Estimated Cost	$21 M

Narrative Description of the Need for this Project
These lines may become overloaded for local contingencies.

Other Transmission Solutions Considered
Series line reactors

Why this Project was Selected as the Preferred Solution
Increased load serving capability

Beulah 100 kV Line (Lookout-EnergyUnited Del 18), Upgrade

- **NERC Category P1/P2/P3/P4/P5/P6/P7 violation**
- **Problem:** Contingencies involving the loss of either circuit can overload the remaining circuit.
- **Solution:** Upgrade 5.4 miles of existing transmission line from 795 ACSR to 1272 ACSR.

Project ID and Name: 0101 – Hinkle 100 kV Line (Stamey-Statesville), Upgrade

Project Description
Upgrade 6 miles of existing transmission to 1272 ACSR.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	3.5 years
Estimated Cost	$22 M

Narrative Description of the Need for this Project
Load growth in the local area may result in these lines becoming overloaded for loss of the parallel circuit, or P6 and P7 events in the local area.

Other Transmission Solutions Considered
Reactors on the Stamey Lines New 230/100/44 kV Tie at Marshall Steam with new 100 kV lines to Statesville Tie, Mooresville Tie and Lookout Tie Storage

Why this Project was Selected as the Preferred Solution
Reactors on the Stamey Lines would cause operational challenges and would serve as a delay to the Hinkle Line rebuild. A new tie would be significantly more expensive and impact more landowners with new lines There is not sufficient land around Statesville Tie to support storage

Hinkle 100 kV Line (Stamey-Statesville), Upgrade

- **NERC Category P3/P6 violation**
- **Problem:** Contingencies involving the loss of either circuit can overload the remaining circuit.
- **Solution:** Upgrade 6 miles of existing transmission line from 795/954 ACSR to 1272 ACSR.

D–38

Project ID and Name: 0102 – Concord 100 kV Line (Concord-Concord City Del 3), Upgrade

Project Description
Upgrade 5.5 miles of existing transmission to 1272 ACSR.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	3.5 years
Estimated Cost	$11 M

Narrative Description of the Need for this Project
The Harrisburg Tie - Concord Main 100 kV Transmission Lines can overload under contingency

Other Transmission Solutions Considered
Dropping load

Why this Project was Selected as the Preferred Solution
Undesirable loadshed

Concord 100 kV Line (Concord-Concord City Del 3), Upgrade

- **NERC Category P2/P4 violation**
- **Problem: Load growth and** contingencies at Harrisburg can cause this line to overload.
- **Solution:** Upgrade 5.5 miles of existing transmission line from 477 ACSR to 1272 ACSR.

Project ID and Name: 0103 – Crab Orchard 100 kV Line (Harrisburg-Amity), Upgrade

Project Description
Upgrade 6.45 miles of existing transmission to 1272 ACSR.

Status	Planned
Transmission Owner	DEC
Planned In-Service Date	12/1/28
Estimated Time to Complete	4 years
Estimated Cost	$15 M

Narrative Description of the Need for this Project
A section of the Harrisburg Tie - Amity Switching Station 100 kV Transmission Lines can overload under contingency

Other Transmission Solutions Considered
Reconfigure some of the local 100 kV transmission.

Why this Project was Selected as the Preferred Solution
Reconfiguration doesn't fully address the issue.

Crab Orchard 100 kV Line (Harrisburg-Amity), Upgrade

- **NERC Category P2 violation**
- **Problem:** Contingencies at Harrisburg can cause this line to overload.
- **Solution:** Rebuild 6.45 miles of existing transmission line from 477 ACSR to 1272 ACSR.

Project ID and Name: 0104 – Hands Mill Switching Station, Construct

Project Description
Construct new switching station on Newport B/W 230 kV (Newport-Catawba). Post-construction nomenclature of lines becomes Newport B/W 230 kV (Hands Mill-Newport) and Branyon B/W 230 kV (Hands Mill-Catawba).

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	6/1/27
Estimated Time to Complete	3.5 years
Estimated Cost	$51 M

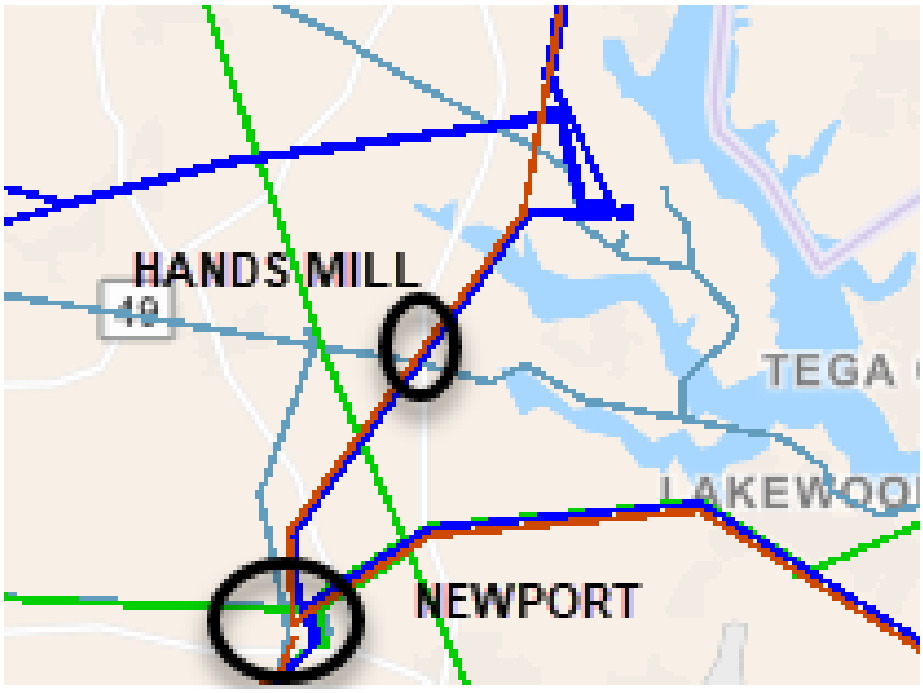
Narrative Description of the Need for this Project
Station is needed to serve new load customer.

Other Transmission Solutions Considered
Size and location of the customer request, necessitated a switching station solution for their delivery

Why this Project was Selected as the Preferred Solution
The size of the customer request (≥ 120 MW) required a switching station solution

Hands Mill Switching Station, Construct

- **New Load**
- **Solution:** Construct new 230 kV switching station on Newport B/W 230 kV line (Newport-Catawba).



Project ID and Name: 0105 – Kennedy 100 kV Line (Orchard-Newton Tap), Upgrade

Project Description
Upgrade 4.2 miles of existing transmission to 1272 ACSR.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	3.5 years
Estimated Cost	$11 M

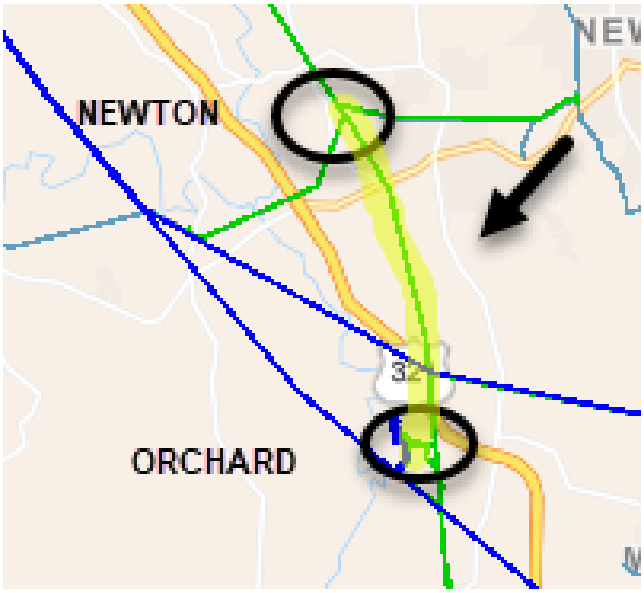
Narrative Description of the Need for this Project
Load growth in the local area may result in these lines becoming overloaded for loss of the parallel circuit, or P6 and P7 events in the local area.

Other Transmission Solutions Considered
New 100 kV line between Orchard and Lyle Creek Remedial Action Scheme

Why this Project was Selected as the Preferred Solution
The remedial action scheme is being implemented, but with the load growth in the area, it will eventually become obsolete. The line rebuild will be needed at that point. The new line would require ~12 miles of new rights of way and rebuilds of another 10 miles of tap lines. It would not fully address the Kennedy issues but would allow the remedial action scheme to continue to be a viable option

Kennedy 100 kV Line (Orchard-Newton Tap), Upgrade

- **NERC Category P3/P6/P7 violation**
- **Problem:** Loss of the parallel circuit or P6 and P7 events in the local area may overload this line.
- **Solution:** Upgrade 4.2 miles of existing transmission line from 477 ACSR to 1272 ACSR.



Project ID and Name: 0107 – Buckhorn 44 kV Line, Conversion

Project Description
Rebuild 2.2 miles of existing transmission as double circuit 556 ACSR—44 kV on one side and 100 kV (tapped from Eno W 100 kV) on the other side. Serve Piedmont EMC Del 10 from new 100 kV circuit.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	12/1/24
Estimated Time to Complete	1 year
Estimated Cost	$11 M

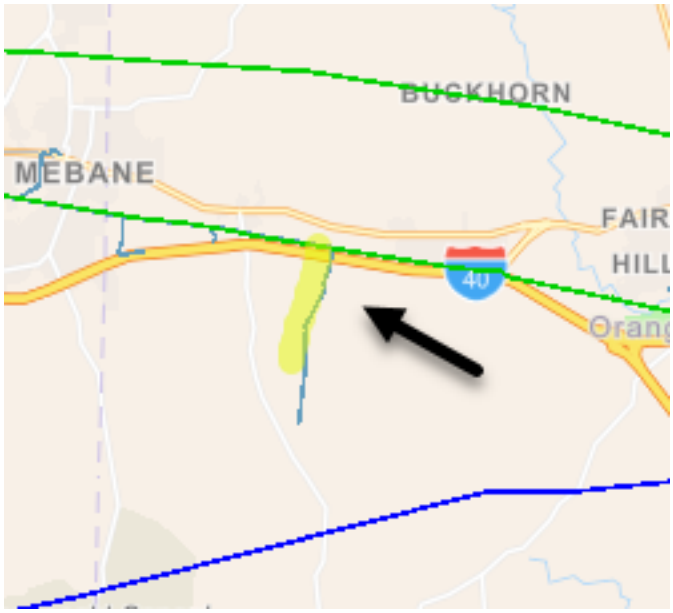
Narrative Description of the Need for this Project
Project is needed to support new wholesale load.

Other Transmission Solutions Considered
An upgrade of the upstream constrained line section was considered but was deemed inadequate due to not resolving low voltage issues.

Why this Project was Selected as the Preferred Solution
This was the only viable solution.

Buckhorn 44 kV Line, Conversion

- **New Load**
- **Solution:** Convert 2.2 miles of single circuit 44 kV to double circuit (100 kV on one side, 44 kV on the other side), and tap the new 100 kV to the Eno W 100 kV circuit.



Project ID and Name: 0108 – Messer 230 kV Line (Dixon School Rd-New Customer)

Project Description
Construct new 230 kV line between Dixon School Rd and a new customer.

Status	Planned
Transmission Owner	DEC
Planned In-Service Date	12/1/26
Estimated Time to Complete	3 years
Estimated Cost	$14 M

Narrative Description of the Need for this Project
Line is needed to serve new load customer.

Other Transmission Solutions Considered
Rebuild of 5 miles of 44 kV lines and new 100 kV terminals at Hilltop Tie

Why this Project was Selected as the Preferred Solution
The 44 kV lines run through downtown Kings Mountain and do not have clean right of way. This would make the rebuild option significantly more challenging, have a longer timeline, and more expensive. New 230 kV line meets the customer's timeline

Messer 230 kV Line (Dixon School Rd-New Customer)

- **New Load**
- **Solution:** Construct 1.3 miles of new transmission line from Dixon School Rd to new Customer.

Project ID and Name: 0109 – Terrell 44 kV Line, Conversion

Project Description
Rebuild Terrell 44 kV line between Lookout and Marshall as double circuit 954 ACSR—44 kV on one side and 100 kV on the other side. Add 100 kV terminal at Lookout. Convert existing 44 kV deliveries to 100 kV, as needed.

Status	Conceptual
Transmission Owner	DEC
Planned In-Service Date	TBD
Estimated Time to Complete	4 years
Estimated Cost	$26 M

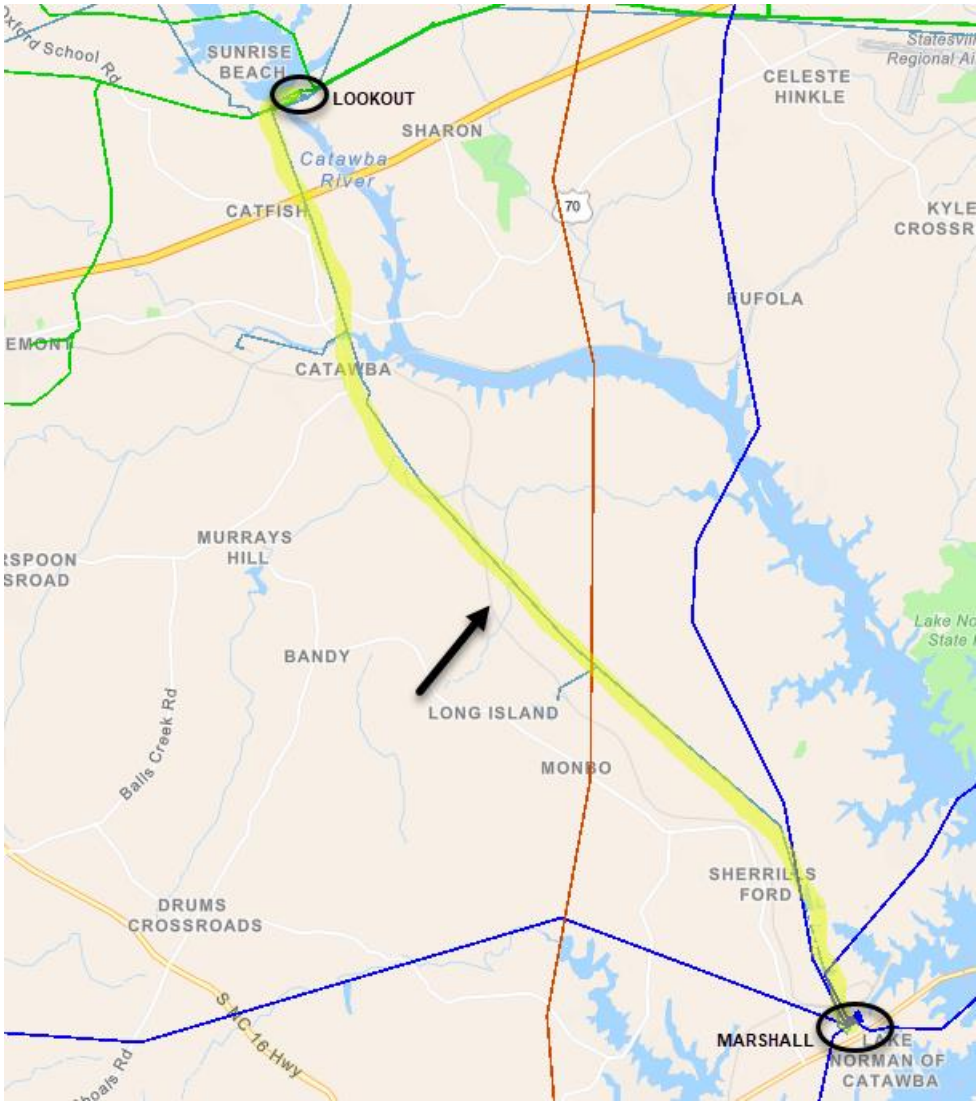
Narrative Description of the Need for this Project
Line can experience thermal and voltage issues during periods of high load.

Other Transmission Solutions Considered
Marshall 230/100 kV tie. Extending the North Denver Retail Tap (9 miles).

Why this Project was Selected as the Preferred Solution
A 230/100 kV tie at Marshall would be expensive and would still require the rebuild of portions of the Terrell 44 kV line, Extending the North Denver Tap will not provide the kind of support needed and may require a greenfield switching station due to the length of such a tap.

Terrell 44 kV Line, Conversion

- **DEC Transmission Planning Practices**
- **Problem:** Line can experience thermal and voltage issues during periods of high load.
- **Solution:** Rebuild 14.2 miles of single circuit 44 kV to double circuit 954 ACSR (100 kV on one side, 44 kV on the other side), add 100 kV terminal at Lookout, and convert existing 44 kV deliveries to 100 kV, as needed.



Project ID and Name: 0110 – Troutman 44 kV Line, Conversion

Project Description
Rebuild Troutman 44 kV line between Statesville Tie and the Dunbar 100 kV lines as double circuit 954 ACSR—44 kV on one side and 100 kV (to be named Dunbar Bl) on the other side. Convert Perth Rd Retail 44 kV delivery to 100 kV delivery.

Status	Planned
Transmission Owner	DEC
Planned In-Service Date	6/1/27
Estimated Time to Complete	3.5 years
Estimated Cost	$30 M

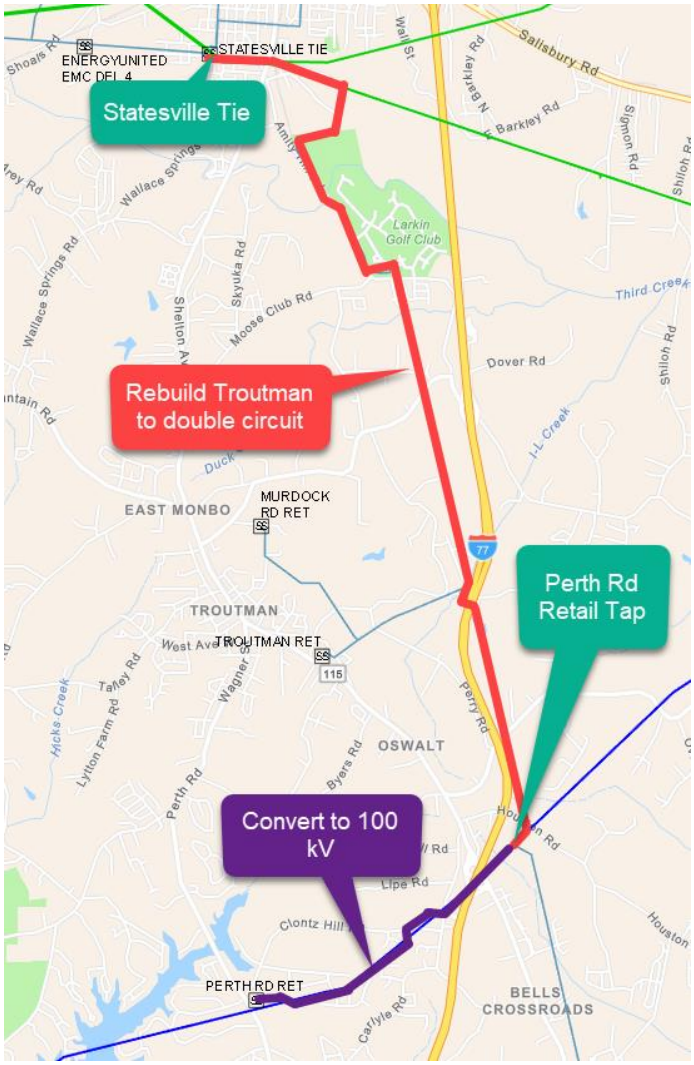
Narrative Description of the Need for this Project
The project is needed to mitigate voltage issues and to reduce loading issues on other 100 kV lines, which are driven by increasing load projections in the local area.

Other Transmission Solutions Considered
230/44 kV Tie station New Marshall 230/100/44 kV tie with new lines to Statesville Tie, Mooresville Tie, and Lookout Tie

Why this Project was Selected as the Preferred Solution
A new 230/100/44 kV tie at Marshall would be significantly more expensive, impact a significant number of landowners, and would require rebuilding of parts of the Troutman Line anyway. The line rebuild has more benefits to supporting load in the Mooresville area than the 230/100/44 kV Tie. The 230/100/44 kV tie would also take longer to build.

Troutman 44 kV Line, Conversion

- **DEC Transmission Planning Practices**
- **Problem:** Line can experience thermal and voltage issues.
- **Solution:** Rebuild 7.7 miles of single circuit 44 kV to double circuit 954 ACSR (100 kV on one side, 44 kV on the other side), and convert Perth Rd Retail from 44 kV to 100 kV.



Project ID and Name: 0115 – Havelock 230/115 kV Banks 1 & 2, Replace

Project Description
This project consists of replacing the two existing 230/115 banks 1 & 2 at the Havelock 230 kV substation rated at 224 MVA with 336 MVA banks.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2024
Estimated Time to Complete	0.5 years
Estimated Cost	$10 M

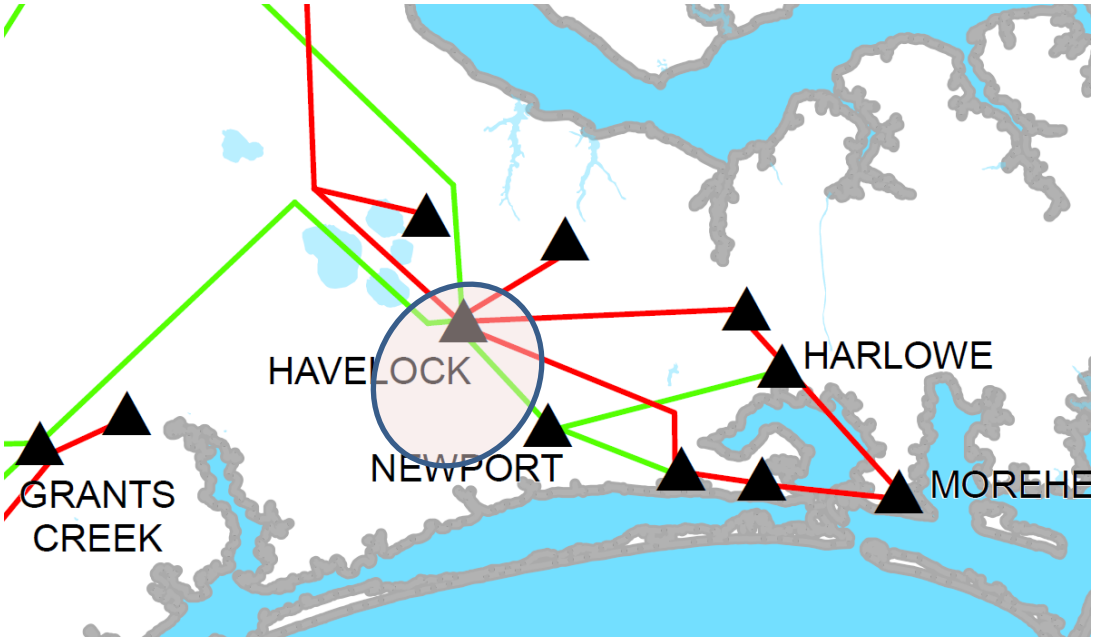
Narrative Description of the Need for this Project
Failure of the Havelock 230 kV CB29 (NERC P2) which results in opening the Havelock 230/115 kV bank #1 and the Havelock –Newport 230 kV line, overloads Havelock bank #2. Also, NERC P6 failure of either Havelock 230/115 kV transformer plus the Havelock-Newport 230 kV line overloads the remaining Havelock transformer.

Other Transmission Solutions Considered
Rebuild entire 230 kV Substation.

Why this Project was Selected as the Preferred Solution
The cost and construction feasibility are much better with selected alternative.

Havelock 230/115 kV Banks 1 & 2, Replace

- **NERC Category P2 & P6 violation**
- **Problem:** Failure of the Havelock 230 kV CB29 (NERC P2) which results in opening the Havelock 230/115 kV bank #1 and the Havelock –Newport 230 kV line, overloads Havelock bank #2. Also, NERC P6 failure of either Havelock 230/115 kV transformer plus the Havelock-Newport 230 kV line overloads the remaining Havelock transformer.
- **Solution:** This project consists of replacing the two existing 230/115 banks 1 & 2 at the Havelock 230 kV substation rated at 224 MVA with 336 MVA banks.



Project ID and Name: 0116 – Rocky Mount – Battleboro 115 kV Line, Reconductor

Project Description
Reconductor the Rocky Mount – VEPCO Battleboro 115 kV line with 3-795 MCM ACSS/TW conductor.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2025
Estimated Time to Complete	1.5 years
Estimated Cost	$30 M

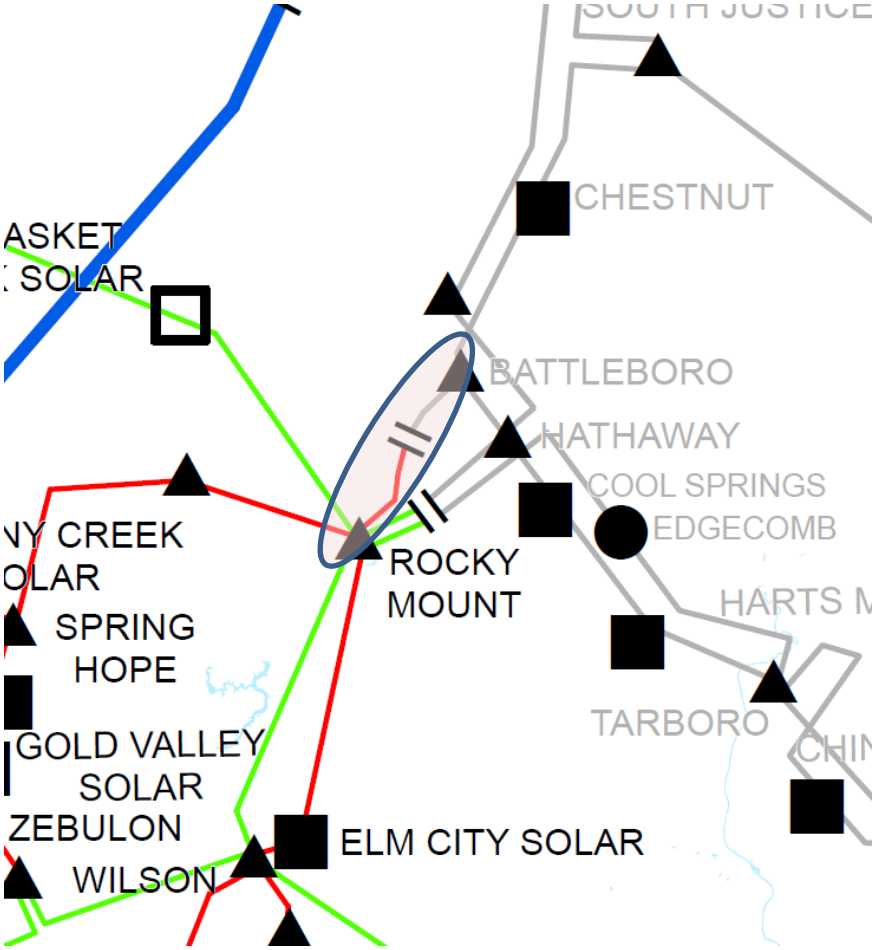
Narrative Description of the Need for this Project
With generation in the PJM queue, the NERC P7 outage of both Rocky Mount – Hathaway 230 kV lines overloads the Rocky Mount – VEPCO Battleboro 115 kV line.

Other Transmission Solutions Considered
Construct a new line between Rocky Mount 115 and BEPCO Battleboro 115 kV Substation.

Why this Project was Selected as the Preferred Solution
Cost and feasibility. Reconductoring is much more cost effective.

Rocky Mount – Battleboro 115 kV Line, Reconductor

- **NERC Category P7 violation**
- **Problem:** With generation in the PJM queue, the NERC P7 outage of both Rocky Mount – Hathaway 230 kV lines overloads the Rocky Mount – VEPCO Battleboro 115 kV line.
- **Solution:** Reconductor the Rocky Mount – VEPCO Battleboro 115 kV line with 3-795 MCM ACSS/TW conductor.



Project ID and Name: 0117 – Asheville Plant – Oteen 115 kV West Line (Arden), Construct

Project Description
This project consists of constructing approximately 2 miles of 1272 MCM ACSR tap line, double circuited with the East line, from structure #2 on the Asheville Plant-Oteen 115 kV West line to Arden 115 kV Substation on the Asheville Plant-Oteen 115 kV East line. Existing right-of-way is to be utilized. The Arden 115 kV Substation will be connected to this new tap line.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2026
Estimated Time to Complete	2.5 years
Estimated Cost	$12 M

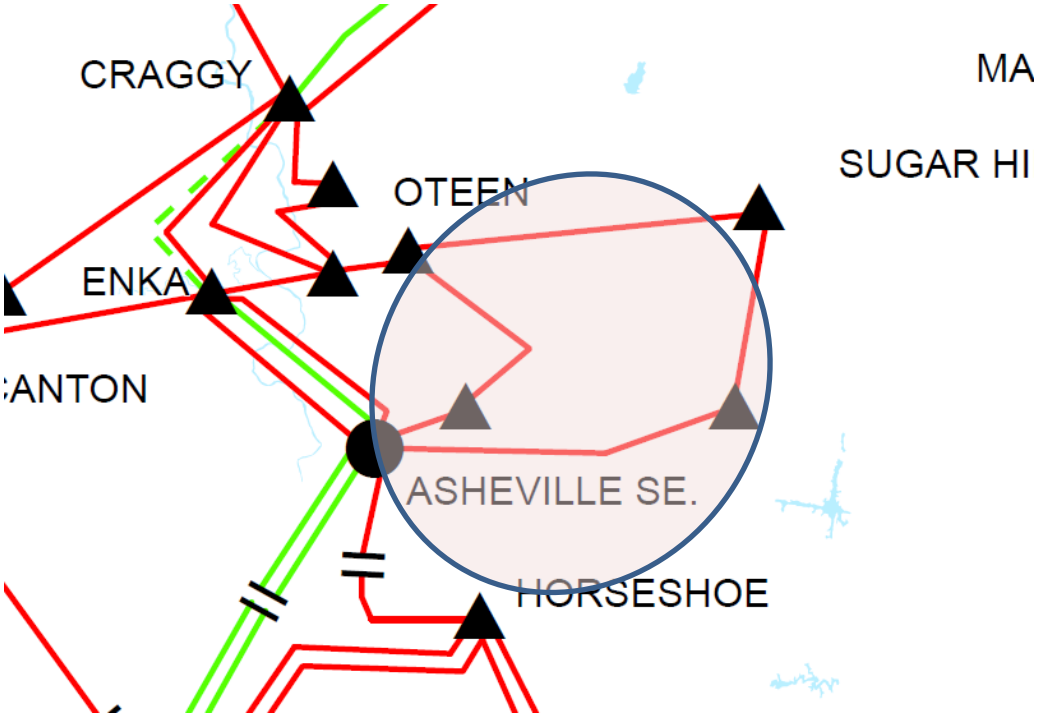
Narrative Description of the Need for this Project
By winter 2024/25, loss of the Asheville Plant terminal of the Asheville Plant-Oteen 115 kV East line will produce voltages on the line below Planning criteria. This project will mitigate this issue.

Other Transmission Solutions Considered
Construct new line from Asheville Plant to Oteen 115 kV West.

Why this Project was Selected as the Preferred Solution
The cost and construction feasibility are much better with selected alternative.

Asheville Plant – Oteen 115 kV West Line (Arden), Construct

- **NERC Category P2 & P6 violation**
- **Problem:** By winter 2024/25, loss of the Asheville Plant terminal of the Asheville Plant-Oteen 115 kV East line will produce voltages on the line below Planning criteria. This project will mitigate this issue.
- **Solution:** This project consists of constructing approximately 2 miles of 1272 MCM ACSR tap line, double circuited with the East line, from structure #2 on the Asheville Plant-Oteen 115 kV West line to Arden 115 kV Substation on the Asheville Plant-Oteen 115 kV East line. Existing right-of-way is to be utilized. The Arden 115 kV Substation will be connected to this new tap line.



Project ID and Name: 0118 – Weatherspoon – LOF 115 kV Line (Weatherspoon-LREMC West Lumberton), Reconductor

Project Description
Reconductor Weatherspoon-LREMC West Lumberton section approximately 8) of Weatherspoon - LOF 115 kV line.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	12/1/2026
Estimated Time to Complete	3 years
Estimated Cost	$27 M

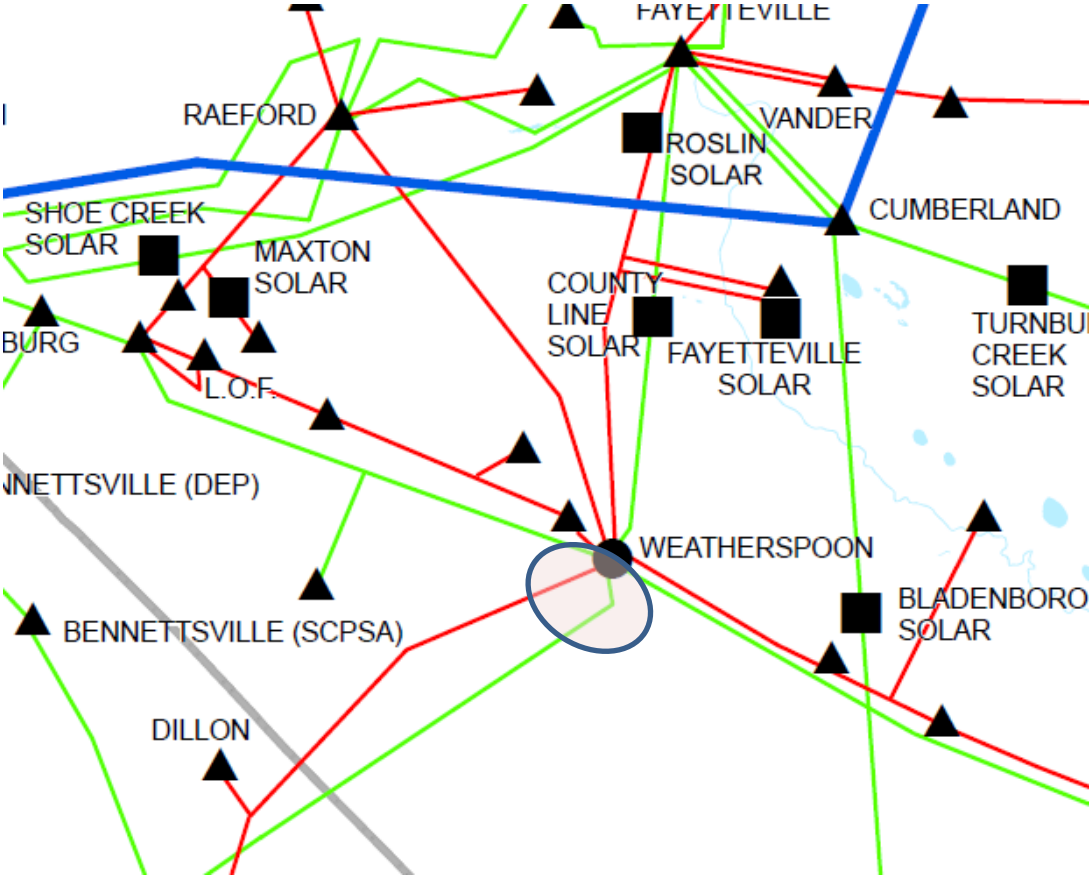
Narrative Description of the Need for this Project
The Weatherspoon-LREMC West Lumberton section of the Weatherspoon-LOF 115 kV line overloads for various P1, P2, P3, & P5 outages.

Other Transmission Solutions Considered
Convert Weatherspoon – LOF 115 kV line to 230 kV line.

Why this Project was Selected as the Preferred Solution
Cost and feasibility. Reconductoring is much more cost effective.

Weatherspoon – LOF 115 kV Line (Weatherspoon-LREMC West Lumberton), Reconductor

- **NERC Category P1, P2, P3, & P5 violation**
- **Problem:** The Weatherspoon-LREMC West Lumberton section of the Weatherspoon-LOF 115 kV line overloads for various P1, P2, P3, & P5 outages.
- **Solution:** Reconductor Weatherspoon-LREMC West Lumberton section (8.26 miles) of Weatherspoon - LOF 115 kV line.



Project ID and Name: 0119 – Weatherspoon – LOF 115 kV Line (Maxton-Pembroke), Reconductor

Project Description
Reconductor with 795 MCM ACSR or equivalent from Maxton to Pembroke 115 kV substation which is approximately 9 miles. Replace the existing 600A switch (45-2) with a 1200A switch.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2026
Estimated Time to Complete	2.5 years
Estimated Cost	$26 M

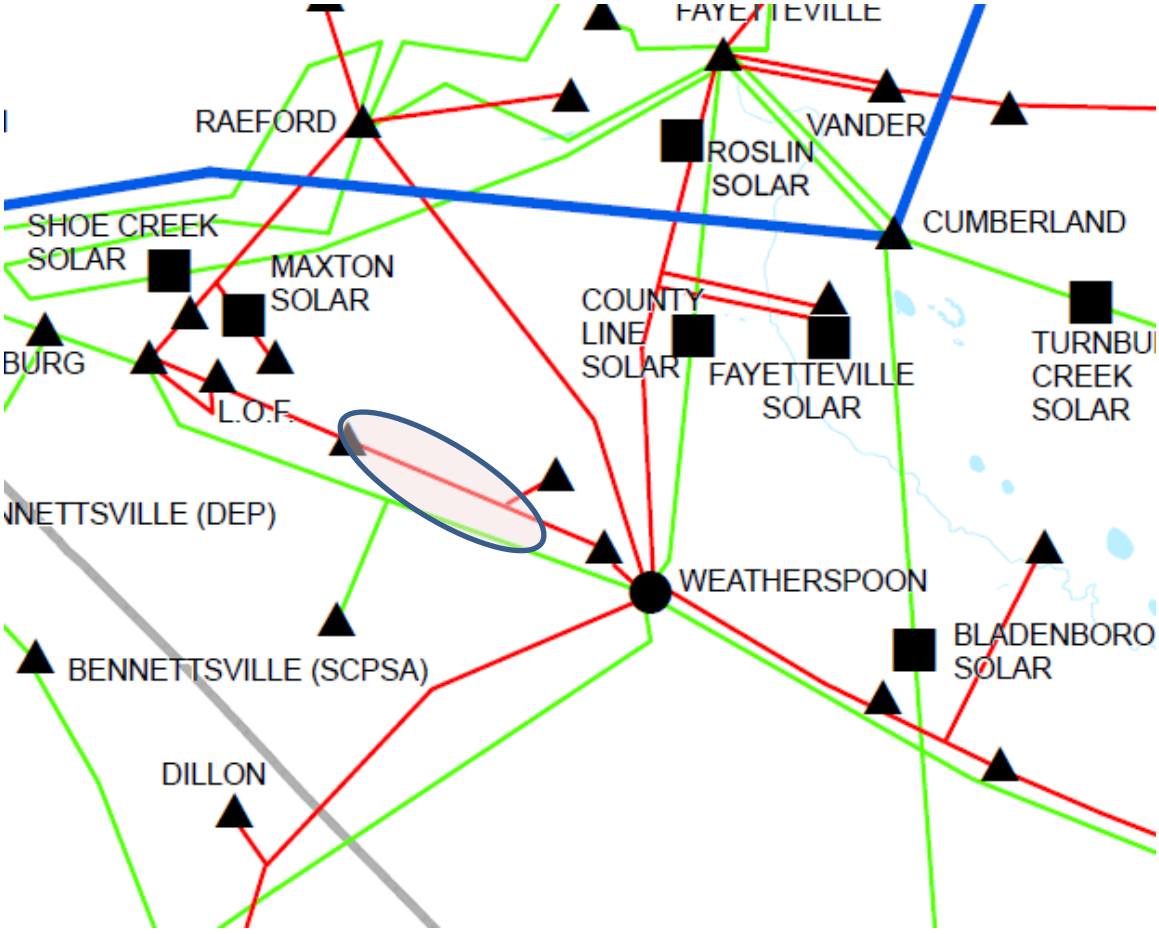
Narrative Description of the Need for this Project
By winter 2026/27, with a Brunswick Unit down, loss of the Weatherspoon-Laurinburg 230 kV Line will cause the Maxton-Pembroke section of the Weatherspoon-LOF 115 kV Line to overload.

Other Transmission Solutions Considered
Convert Weatherspoon – LOF 115 kV line to 230 kV line.

Why this Project was Selected as the Preferred Solution
Cost and feasibility. Reconductoring is much more cost effective.

Weatherspoon – LOF 115 kV Line (Maxton-Pembroke), Reconductor

- **NERC Category P3 violation**
- **Problem:** By winter 2026/27, with a Brunswick Unit down, loss of the Weatherspoon-Laurinburg 230 kV Line will cause the Maxton-Pembroke section of the Weatherspoon-LOF 115 kV Line to overload.
- **Solution:** Reconductor with 795 MCM ACSR or equivalent from Maxton to Pembroke 115 kV substation which is approximately 9 miles. Replace the existing 600A switch (45-2) with a 1200A switch.



Project ID and Name: 0120 – Sumter – SCEG Eastover 115 kV Line (Kings Hwy – Shaw Field – Eastover), Reconductor

Project Description
Reconductor Sumter Kings Hwy - Shaw Field Tap and Shaw Field Tap - DESC Eastover sections of Sumter-Eastover 115 kV line to 1272 ACSR and raise Sumter Gold Kist Tap - Str #427 to 212 F.

Status	Planned
Transmission Owner	DEP
Planned In-Service Date	6/1/2027
Estimated Time to Complete	3.5 years
Estimated Cost	$19 M

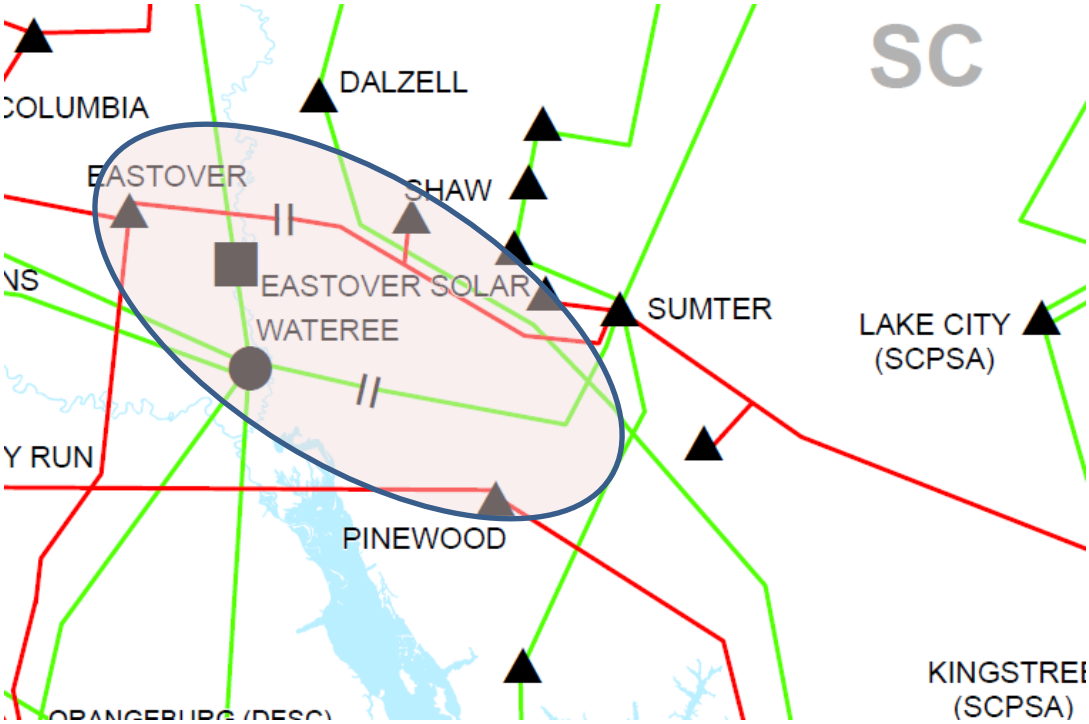
Narrative Description of the Need for this Project
Various P3 outages consisting of a double circuit line outage along with a TRM scenario with a large generator down cause the Shaw Field Tap-Eastover section of the Sumter-Eastover 115 kV line to overload.

Other Transmission Solutions Considered
Construct a new line from Sumter 115 kV Substation to SCEG Eastover 115 kV Substation.

Why this Project was Selected as the Preferred Solution
Cost and feasibility. Reconductoring is much more cost effective.

Sumter – SCEG Eastover 115 kV Line, (Kings Hwy – Shaw Field – Eastover), Reconductor

- **NERC Category P3 violation**
- **Problem:** Various P3 outages consisting of a double circuit line outage along with a TRM scenario with a large generator down cause the Shaw Field Tap-Eastover section of the Sumter-Eastover 115 kV line to overload.
- **Solution:** Reconductor Sumter Kings Hwy - Shaw Field Tap and Shaw Field Tap - DESC Eastover sections of Sumter-Eastover 115 kV line to 1272 ACSR and raise Sumter Gold Kist Tap - Str #427 to 212 F.



Project ID and Name: 0121 – Brush Creek, Construct STATCOM

Project Description
Add STATCOM to Brushcreek 23kV Switching Station.

Status	Planned
Transmission Owner	DEP
Planned In-Service Date	12/1/2028
Estimated Time to Complete	5 years
Estimated Cost	$40 M

Narrative Description of the Need for this Project
This upgrade is needed for the addition of new economic development loads. With the addition of these new loads certain contingencies cause low voltages on the grid. The reactive power from the STATCOM is needed to mitigate this.

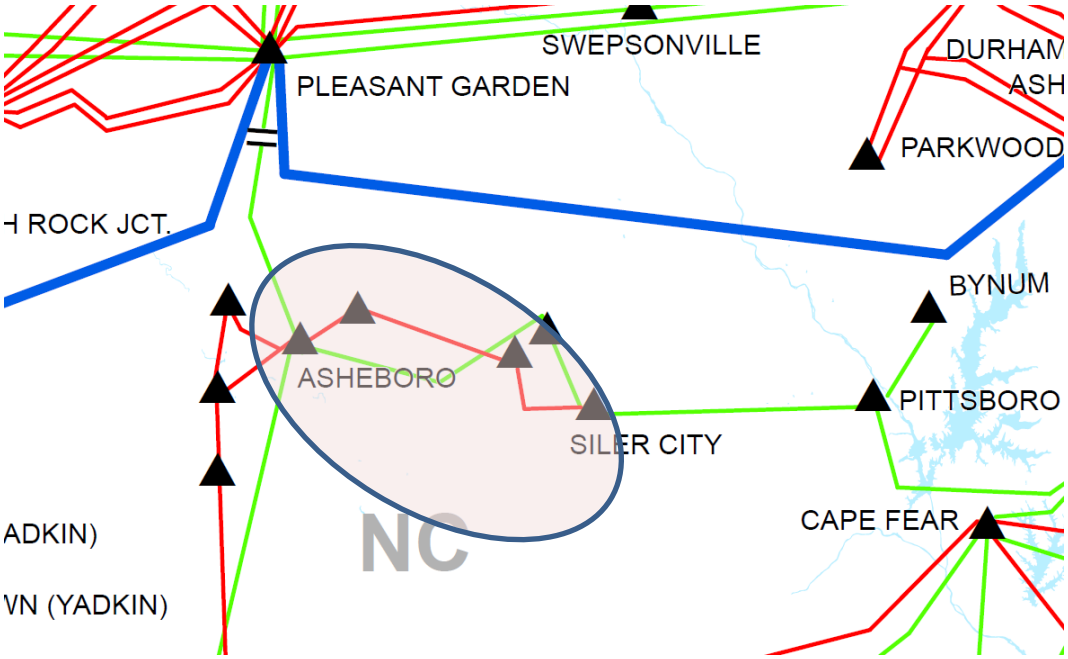
Other Transmission Solutions Considered
Add new generation around Brushcreek.

Why this Project was Selected as the Preferred Solution
Cost and feasibility. Reconductoring is much more cost effective.

Brush Creek, Construct STATCOM

- **NERC Category P3 violation**
- **Problem:** This upgrade is needed for the addition of new economic development loads. With the addition of these new loads certain contingencies cause low voltages on the grid. The reactive power from the STATCOM is needed to mitigate this.

Solution: Add STATCOM to Brush Creek 23kV Switching Station.



Project ID and Name: 0122 – Asheboro – Siler City 115 kV Line, Reconductor

Project Description
Reconductor 22.66 mi of the entire Asheboro – Siler City 115 kV Line

Status	Planned
Transmission Owner	DEP
Planned In-Service Date	12/1/2028
Estimated Time to Complete	5 years
Estimated Cost	$75 M

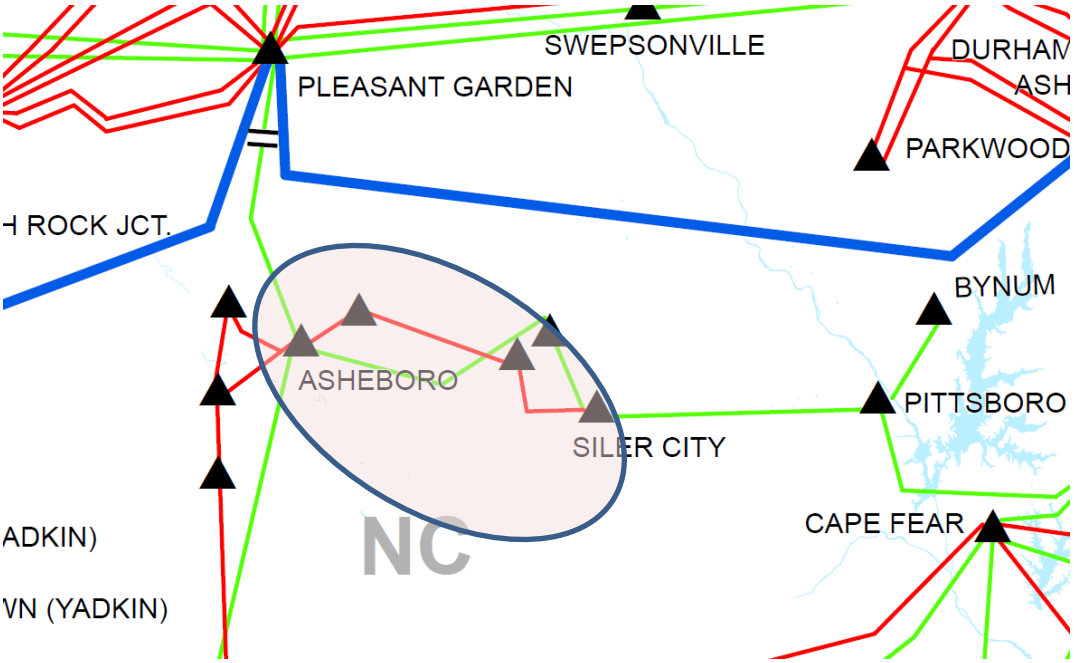
Narrative Description of the Need for this Project
This upgrade is needed for the addition of new economic development loads.

Other Transmission Solutions Considered
Build a new line between Asheboro 115 kV Substation and Siler City 115 kV Substation.

Why this Project was Selected as the Preferred Solution
Cost and feasibility. Reconductoring is much more cost effective.

Asheboro – Siler City 115 kV Line, Reconductor

- **NERC Category P1 & P3 violation**
- **Problem:** This upgrade is needed for the addition of new economic development loads.
- **Solution:** Reconductor 22.66 mi of the entire Asheboro – Siler City 115 kV Line.



Project ID and Name: 0123 – Falls – Franklinton (Franklinton – Franklinton Novo 115 kV Feeder), Construct

Project Description
Construct new line from Franklinton – Franklinton Novo 115 kV feeder

Status	Conceptual
Transmission Owner	DEP
Planned In-Service Date	TBD
Estimated Time to Complete	5 years
Estimated Cost	$75 M

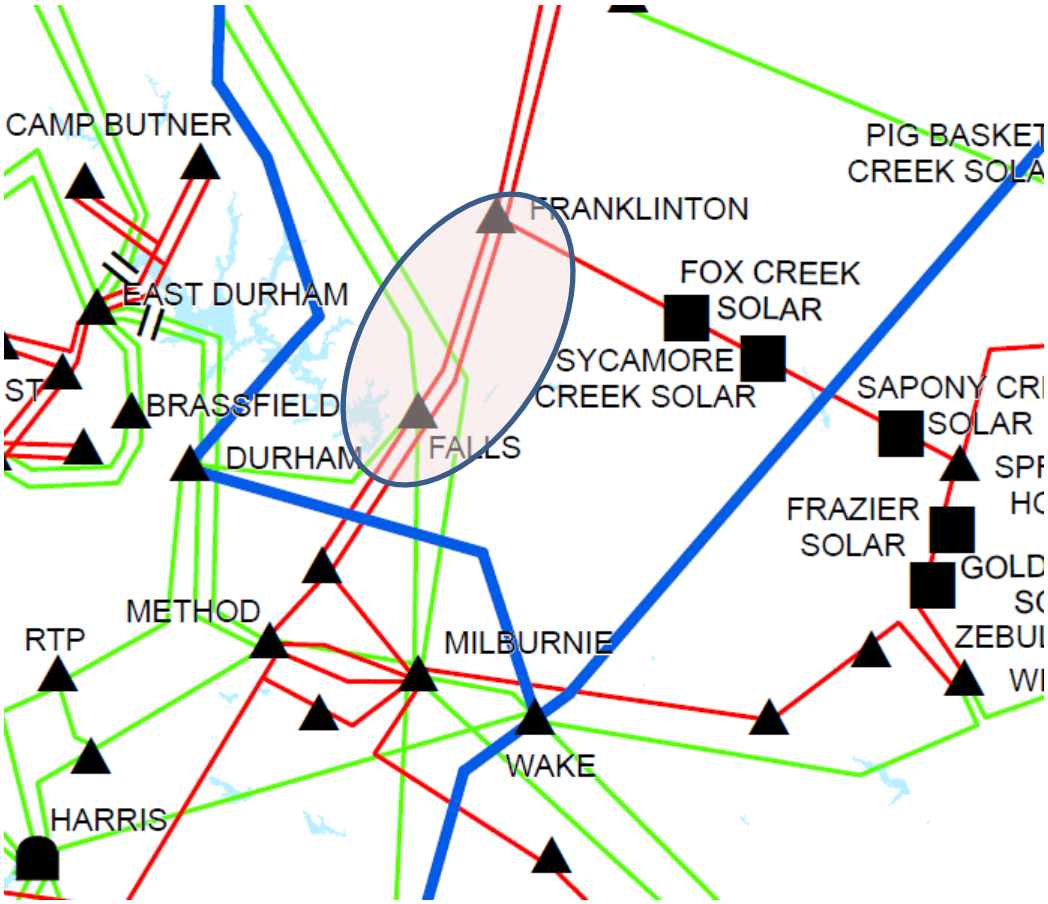
Narrative Description of the Need for this Project
NERC P1 outage of the Novozymes-Franklinton segment of the Franklinton-Spring Hope SS 115 kV line causes low voltages at buses on the line even after addition of the Louisburg 115 kV capacitor. Also caused by the P2 outage of the Franklinton 115 Bus and multiple P3 scenarios. Additionally, NERC P6 outage of Henderson-Person 230 kV Line and Concord 230/115 kV transformer #1 & bus causes the Falls-Wake EMC POD section of the Falls-Franklinton 115 kV West Line to overload.

Other Transmission Solutions Considered
This upgrade is needed for the addition of new economic development loads.

Why this Project was Selected as the Preferred Solution
Cost and feasibility. Reconductoring is much more cost effective.

Falls – Franklinton (Franklinton – Franklinton Novo 115 kV Feeder), Construct

- **NERC Category P1 & P3 violation**
- **Problem:** NERC P1 outage of the Novozymes-Franklinton segment of the Franklinton-Spring Hope SS 115 kV line causes low voltages at buses on the line even after addition of the Louisburg 115 kV capacitor. Also caused by the P2 outage of the Franklinton 115 Bus and multiple P3 scenarios. Additionally, NERC P6 outage of Henderson-Person 230 kV Line and Concord 230/115 kV transformer #1 & bus causes the Falls-Wake EMC POD section of the Falls-Franklinton 115 kV West Line to overload.
- **Solution:** Construct new line from Franklinton – Franklinton Novo 115 kV feeder



Project ID and Name: 0124 – Castle Hayne-Folkstone 230 kV Line - Porters Neck 230 kV Tap Line, Construct

Project Description
Construct 4.5 mile Porters Neck 230 kV Tap Line on the Castle Hayne-Folkstone 230 kV line using 3-795 MCM ACSR or equivalent

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2024
Estimated Time to Complete	0.5 years
Estimated Cost	$43 M

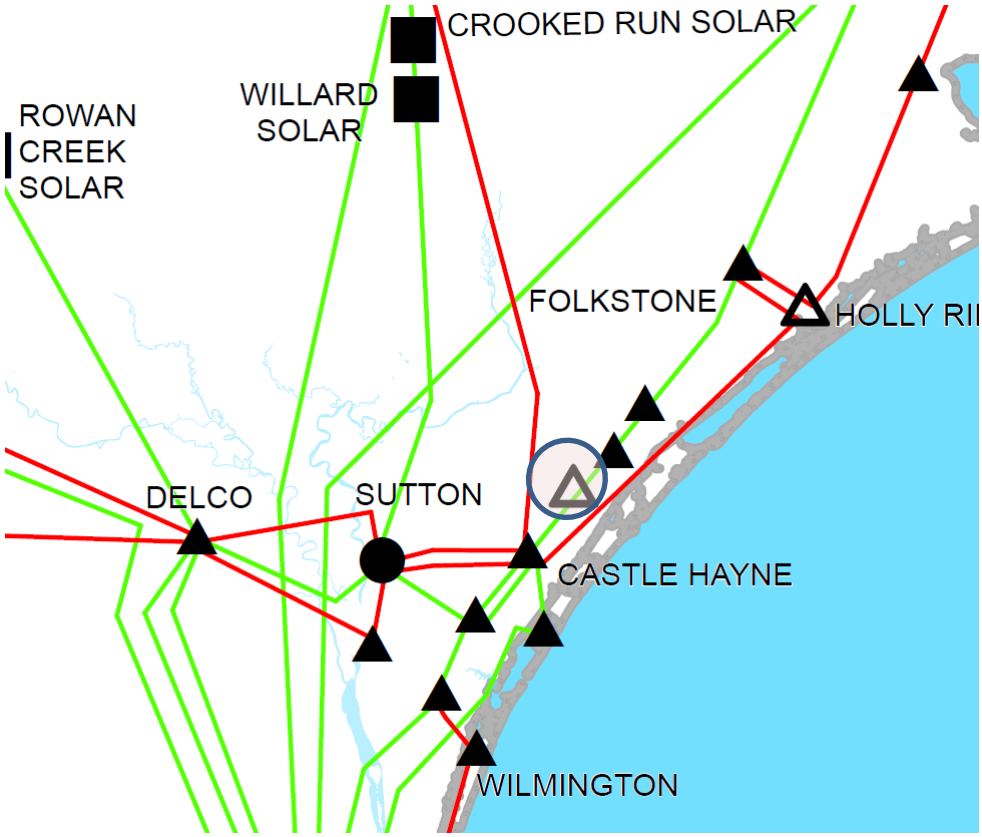
Narrative Description of the Need for this Project
The tap line is required to serve the new Porters Neck 230 kV T-D Substation.

Other Transmission Solutions Considered
Build a switching station at Porters Neck 230 kV.

Why this Project was Selected as the Preferred Solution
Cost and feasibility. Switching station is not needed for Transmission Reliability.

Castle Hayne-Folkstone 230 kV Line - Porters Neck 230 kV Tap Line, Construct**NERC Category**

- **Problem:** The tap line is required to serve the new Porters Neck 230 kV T-D Substation. Not driven by a NERC Category Contingency.
- **Solution:** Construct Porters Neck 230 kV Tap Line



Project ID and Name: 0125 – Method - Milburnie 115 kV North Line, Reconductor

Project Description
Reconductor 7.32 mi (2 sections) of the Method – Milburnie 115 kV North line.

Status	Planned
Transmission Owner	DEP
Planned In-Service Date	6/1/2033
Estimated Time to Complete	9.5 years
Estimated Cost	$25 M

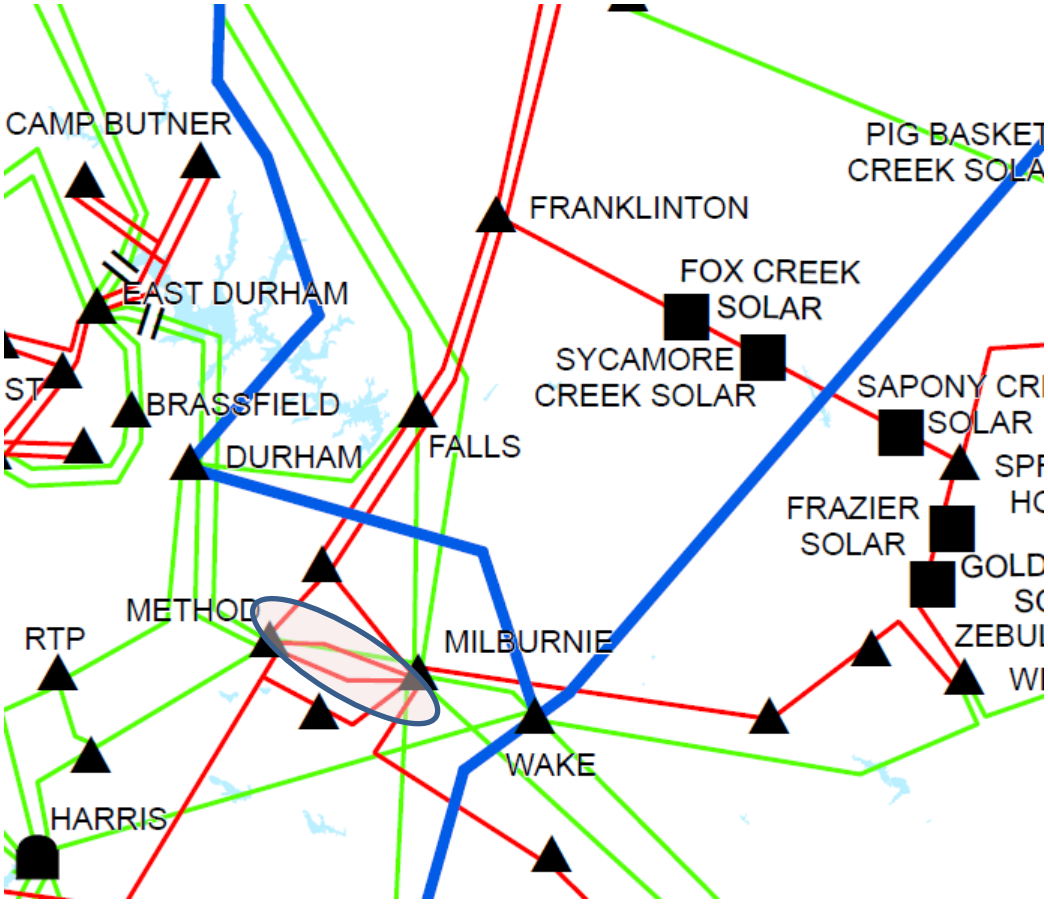
Narrative Description of the Need for this Project
Various P2 and P3 outages consisting of either a breaker outage or a line section outage along with a TRM scenario with a large generator down cause the Method-Raleigh Northside & the Milburnie-Raleigh Timberlake sections of the Method - Milburnie 115 kV North line to overload. A reconductor is needed for a higher summer rating.

Other Transmission Solutions Considered
Build a new line from Method 115 kV Substation to Milburnie 115 kV Substation.

Why this Project was Selected as the Preferred Solution
Cost and feasibility. Reconductoring is much more cost effective.

Method - Milburnie 115 kV North Line, Reconductor

- **NERC Category P2 & P3 violation**
- **Problem:** Various P2 and P3 outages consisting of either a breaker outage or a line section outage along with a TRM scenario with a large generator down cause the Method-Raleigh Northside & the Milburnie-Raleigh Timberlake sections of the Method - Milburnie 115 kV North line to overload. A reconductor is needed for a higher summer rating.
- **Solution:** Reconductor 7.32 mi (2 sections) of the Method – Milburnie 115 kV North line.



Project ID and Name: 0126 – Rockingham – West End 230 kV West Line, Reconductor

Project Description
Reconductor the Rockingham-Wadesboro Tap section (7.96 miles) of the Rockingham – West End 230 kV West line.

Status	Conceptual
Transmission Owner	DEP
Planned In-Service Date	TBD
Estimated Time to Complete	10 years
Estimated Cost	$27 M

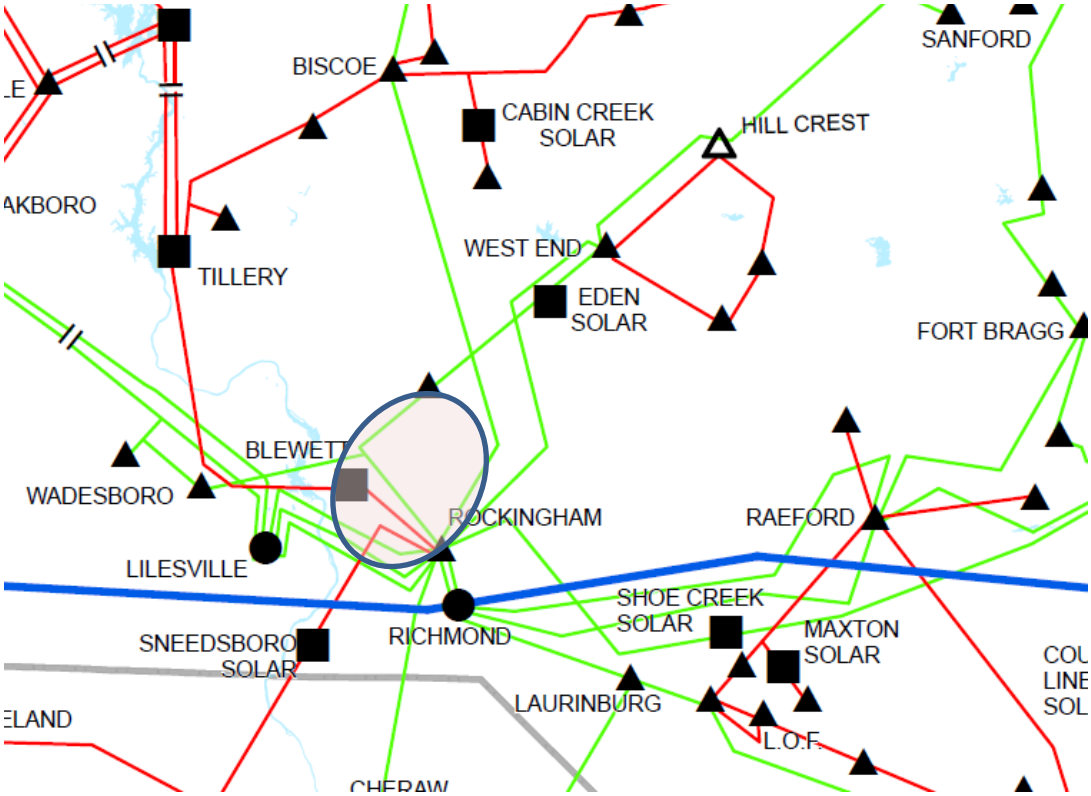
Narrative Description of the Need for this Project
Various P3 outages consisting of a double circuit line outage or single line section outage along with a TRM scenario with a large generator down cause the Rockingham-Wadesboro Tap section of the Rockingham – West End 230 kV West line to overload.

Other Transmission Solutions Considered
Build a new line from Rockingham 230 kV Substation to West End 230 kV Substation.

Why this Project was Selected as the Preferred Solution
Cost and feasibility. Reconductoring is much more cost effective.

Rockingham – West End 230 kV West Line, Reconductor

- **NERC Category P3 violation**
- **Problem:** Various P3 outages consisting of a double circuit line outage or single line section outage along with a TRM scenario with a large generator down cause the Rockingham-Wadesboro Tap section of the Rockingham – West End 230 kV West line to overload.
- **Solution:** Reconductor the Rockingham-Wadesboro Tap section (7.96 miles) of the Rockingham – West End 230 kV West line.



Appendix E Transmission Plan Major Project Listings – Approved Public Policy Projects

2023 Collaborative Transmission Plan – Public Policy Projects						
Project ID	**Reliability Project**	**Status[1]**	**Transmission Owner**	**Projected In-Service Date**	**Estimated Cost ($M)[2]**	**Project Lead Time (Years)[3]**
0070	Cape Fear – West End 230 kV Line, Rebuild	Underway	DEP	6/1/2026	58	2.5
0071	Erwin – Fayetteville East 230 kV Line, Rebuild	Underway	DEP	6/1/2026	61	2.5
0072	Erwin – Fayetteville 115 kV Line, Rebuild	Underway	DEP	6/1/2025	21	1.5
0073	Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild	Underway	DEP	12/1/2024	7	1
0074	Milburnie 230 kV Substation, Upgrade	Underway	DEP	6/1/2026	5	2.5
0075	Weatherspoon – Marion 115 kV Line, Upgrade	Underway	DEP	12/1/2025	21	2
0076	Camden Junction – Wateree 115 kV Line, Rebuild	Underway	DEP	12/1/2026	16	3
0077	Robinson Plant – Rockingham 115 kV Line, Rebuild	Underway	DEP	6/1/2027	42	3.5
0078	Robinson Plant – Rockingham 230 kV Line, Upgrade	Underway	DEP	6/1/2026	50	2.5
0079	Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild	Underway	DEP	6/1/2026	16	2.5
0080	Lee 100 kV Line (Lee-Shady Grove), Upgrade	Underway	DEC	12/1/2025	32	2
0081	Piedmont 100 kV Line (Lee-Shady Grove), Upgrade	Underway	DEC	12/1/2026	41	3

2023 Collaborative Transmission Plan – Public Policy Projects						
Project ID	**Reliability Project**	**Status[1]**	**Transmission Owner**	**Projected In-Service Date**	**Estimated Cost ($M)[2]**	**Project Lead Time (Years)[3]**
0082	Newberry 115 kV Line (Bush River-DESC), Upgrade	Underway	DEC	6/1/2025	35	1.5
0083	Clinton 100 kV Line (Bush River-Laurens), Upgrade	Underway	DEC	12/1/2026	87	3
0085	Camden – - Camden Dupont 115 kV Line, Reconductor	Underway	DEP	12/1/2024	11	1
TOTAL					**503**	

[1] Status: ***In-service****:* Projects with this status are in-service. This status was updated as of 12/1/2023.

Underway*:* Projects with this status range from the Transmission Owner having some money in its current year budget for the project to the Transmission Owner having completed some construction activities for the project.

Planned*:* Projects with this status do not have money in the Transmission Owner's current year budget; and the project is subject to change.

Conceptual*:* Projects with this status are not p*lanned* at this time but will continue to be evaluated as a potential project in the future.

Deferred*:* Projects with this status were identified in the 2021 Report and have been deferred beyond the end of the planning horizon based on analysis performed to develop the 2022 Collaborative Transmission Plan.

Removed: Project is cancelled and no longer in the plan

[2] The estimated cost is in nominal dollars which reflects the sum of the estimated annual cash flows over the expected development period for the specific project (typically 2 – 5 years), including direct costs, loadings and overheads; but not including AFUDC. Each year's cash flow is escalated to the year of the expenditures. The sum of the expected cash flows is the estimated cost.

[3] For projects with a status of Underway, the project lead time is the time remaining to complete construction and place in-service.

Appendix F Transmission Plan Major Project Descriptions – Approved Public Policy Projects

Table of Contents

Note: The estimated cost for each of the projects described in Appendix F is in nominal dollars which reflects the sum of the estimated annual cash flows over the expected development period for the specific project (typically 2 – 5 years), including direct costs, loadings and overheads; but not including AFUDC. Each year's cash flow is escalated to the year of the expenditures. The sum of the expected cash flows is the estimated cost.

Project ID and Name: 0070 – Cape Fear Plant – West End 230 kV Line, Rebuild

Project Description
This project consists of rebuilding the 1272 ACSR portions of the Cape Fear – West End 230 kV Line using 6-1590 MCM ACSR conductor (approximately 26.6 miles). Raise the 2515 ACSR sections to 212F maximum operating temperature (approximately 4.5 miles). Upgrade switches and terminal equipment.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2026
Estimated Time to Complete	2.5 years
Estimated Cost	$58 M

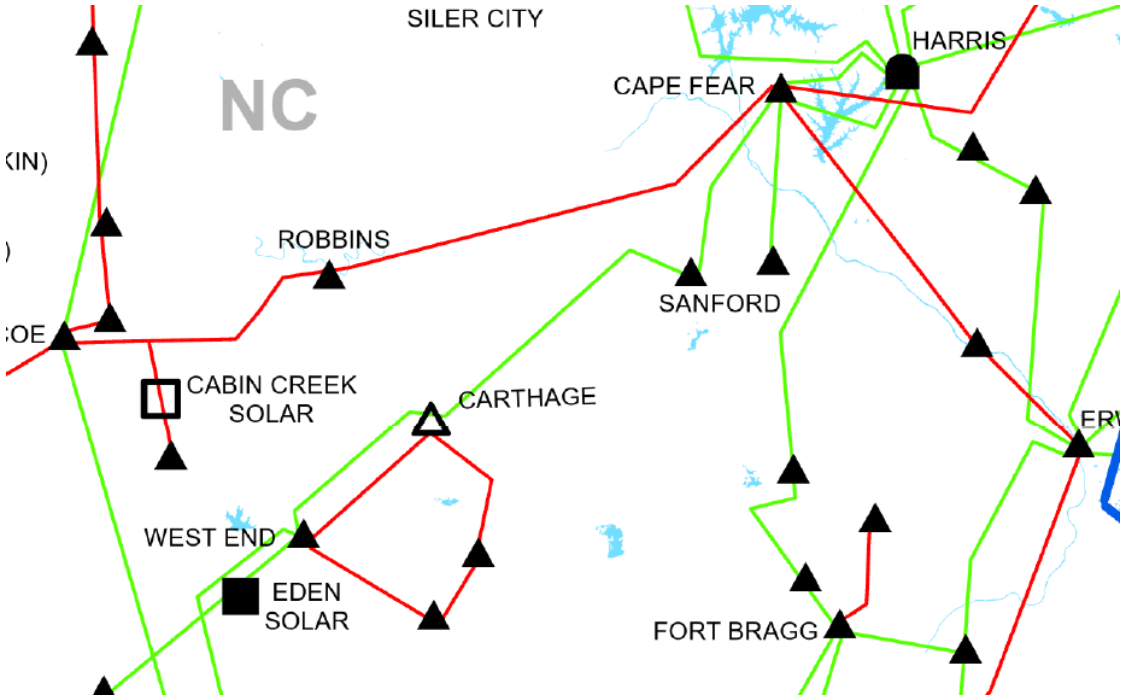
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With additional solar generation in southern DEP, outage of the Cumberland-Wake 500 kV line can overload the Cape Fear – West End 230 kV line.

Other Transmission Solutions Considered
Construct a new 230 kV line between Cape Fear and West End.

Why this Project was Selected as the Preferred Solution
Cost and feasibility are much improved with selected alternative.

Cape Fear – West End 230 kV Line, Rebuild

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 230 kV line.



Project ID and Name: 0071 – Erwin – Fayetteville East 230 kV Line, Rebuild

Project Description
This project consists of rebuilding the Erwin – Fayetteville East 230 kV Line using 6-1590 MCM ACSR conductor (approximately 23 miles).

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2026
Estimated Time to Complete	2.5 years
Estimated Cost	$61 M

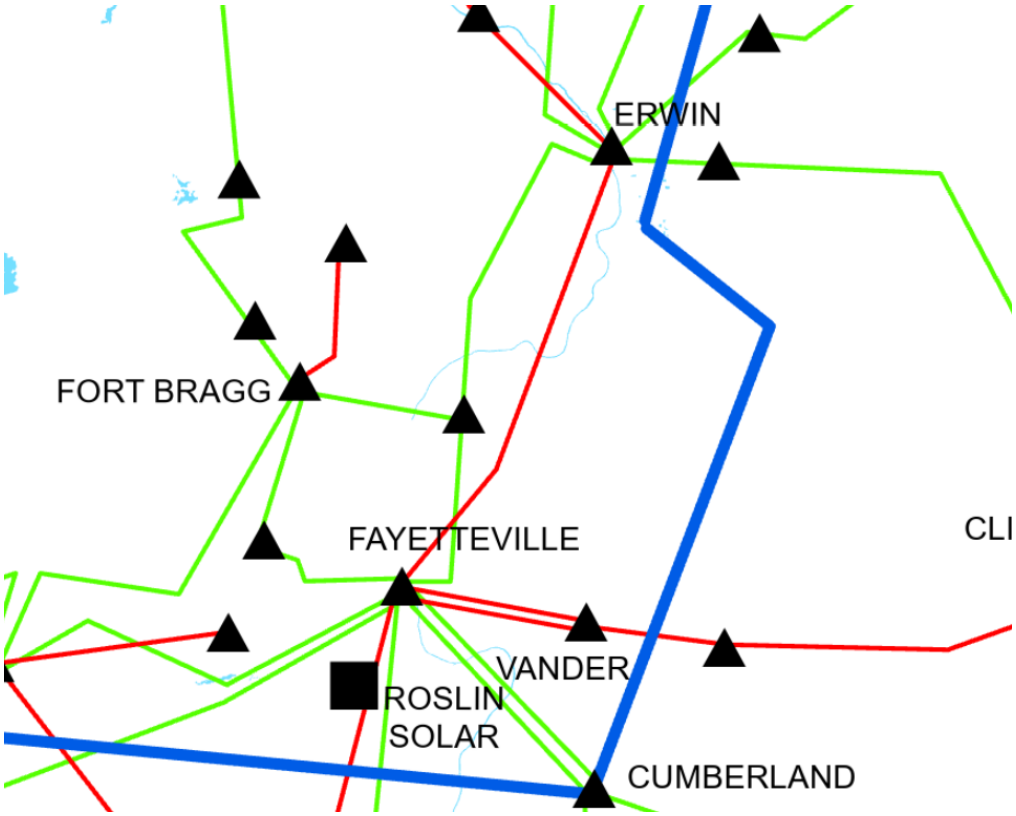
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With additional solar generation in southern DEP, outage of the Cumberland-Wake 500 kV line can overload the Erwin – Fayetteville East 230 kV line.

Other Transmission Solutions Considered
Construct a new 230 kV line between Erwin and Fayetteville East.

Why this Project was Selected as the Preferred Solution
Cost and feasibility are much improved with selected alternative.

Erwin – Fayetteville East 230 kV Line, Rebuild

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 230 kV line.



Project ID and Name: 0072 – Erwin – Fayetteville 115 kV Line, Rebuild

Project Description
This project consists of rebuilding the SREMC Wade – Beard – Slocomb Tap portions of the Erwin – Fayetteville 115 kV Line using 795 ACSS/TW conductor or equivalent (approximately 9 miles).

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2025
Estimated Time to Complete	1.5 years
Estimated Cost	$21 M

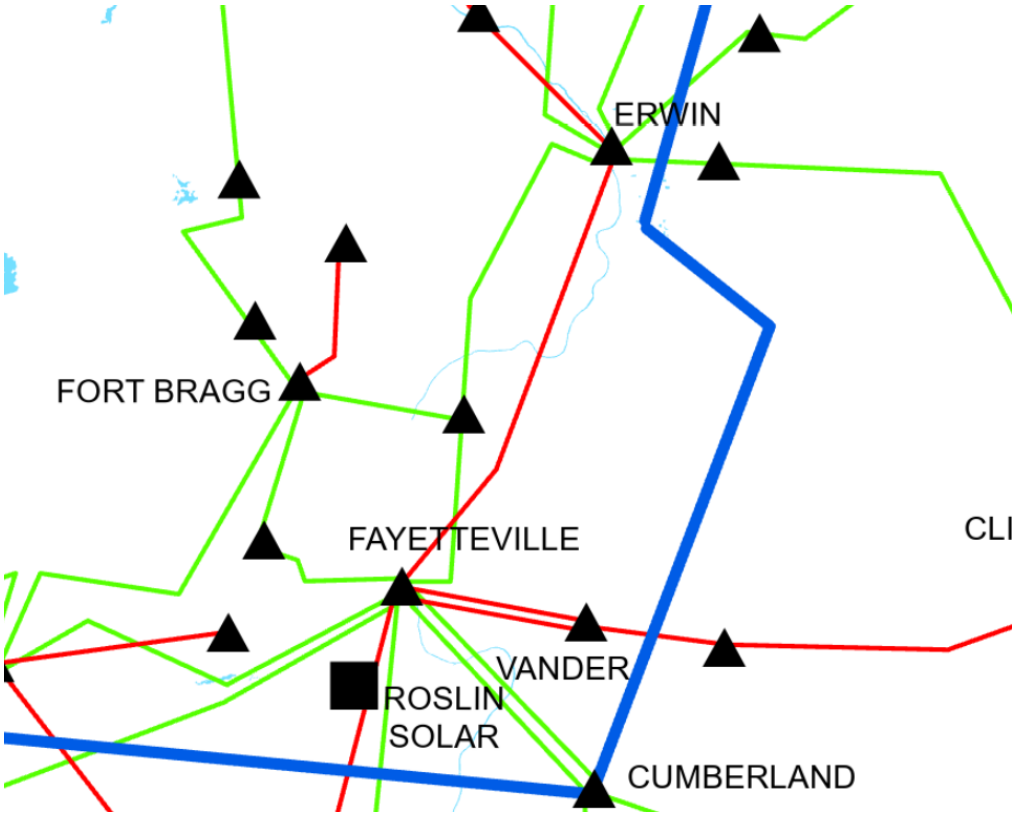
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With additional solar generation in southern DEP, outage of the Cumberland-Wake 500 kV line can overload the Erwin – Fayetteville 115 kV line.

Other Transmission Solutions Considered
Construct a new 115 kV line between Erwin and Fayetteville.

Why this Project was Selected as the Preferred Solution
Cost and feasibility are much improved with selected alternative.

Erwin – Fayetteville 115 kV Line, Rebuild

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 115 kV line.



Project ID and Name: 0073 – Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild

Project Description
This project consists of rebuilding the Hope Mills Church St – Roslin section of the Fayetteville – Fayetteville Dupont 115 kV Line using 795 ACSS/TW conductor or equivalent (approximately 3.2 miles).

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	12/1/2024
Estimated Time to Complete	1 year
Estimated Cost	$7 M

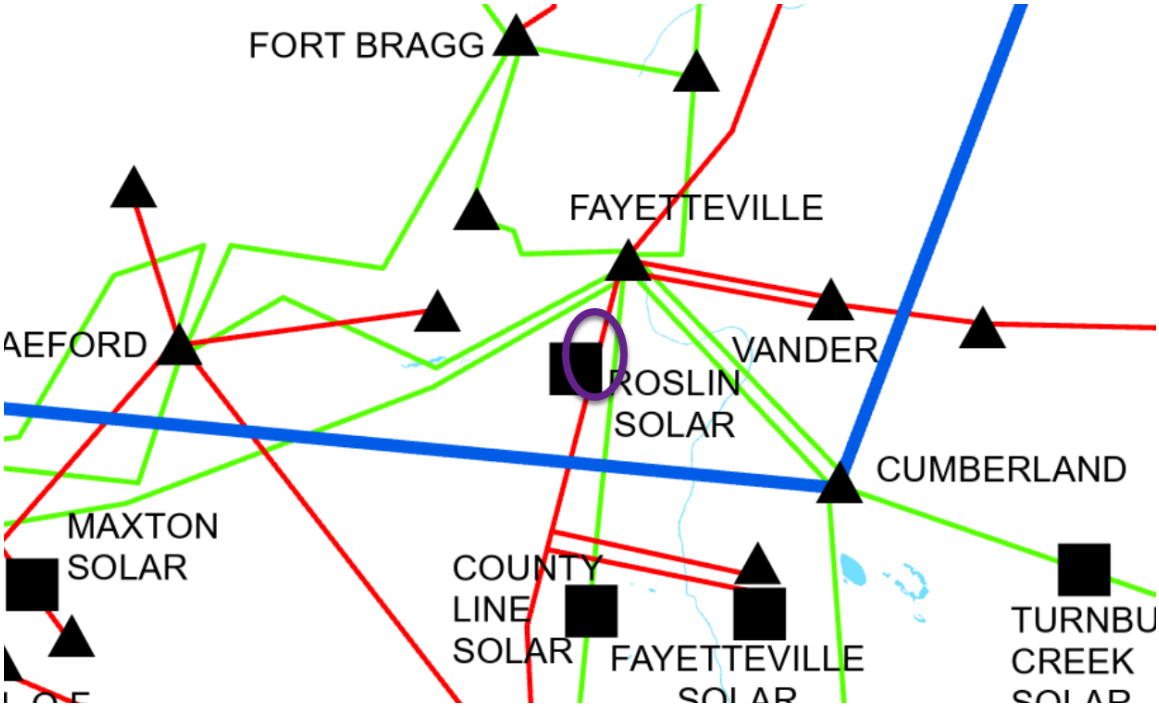
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With additional solar generation in southern DEP, outage of a section of the Weatherspoon – Fayetteville 230 kV line can overload this section of the Fayetteville – Fayetteville Dupont 115 kV line.

Other Transmission Solutions Considered
Construct a new 115 kV line between Fayetteville and Fayetteville Dupont.

Why this Project was Selected as the Preferred Solution
Cost and feasibility are much improved with selected alternative.

Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild 3.2 miles

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 115 kV line.



Project ID and Name: 0074 – Milburnie 230 kV Substation, Upgrade

Project Description
This project consists of adding redundant bus protection at Milburnie 230 kV Substation.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2026
Estimated Time to Complete	2.5 years
Estimated Cost	$5 M

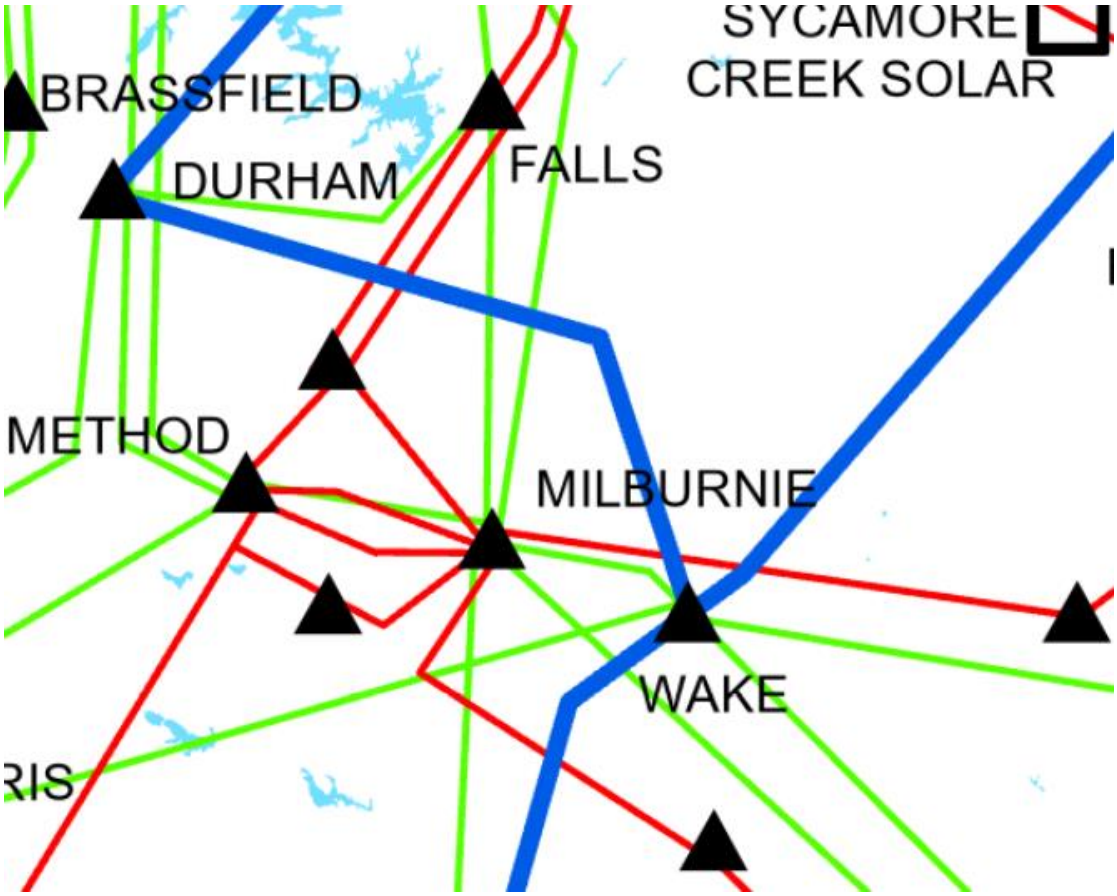
Narrative Description of the Need for this Project
Various solar studies have shown the need for this upgrade. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With additional solar generation in eastern DEP, a Milburnie 230 kV bus fault with relay failure can overload a section of the Clayton Industrial – Selma 115 kV line.

Other Transmission Solutions Considered
Reconductor the 115 kV line between Clayton Industrial and Selma.

Why this Project was Selected as the Preferred Solution
Cost and feasibility are much improved with selected alternative.

Milburnie 230 kV Substation, Upgrade

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Add redundant bus protection.



Project ID and Name: 0075 – Weatherspoon – Marion 115 kV Line, Upgrade

Project Description
Reconductor a 6.45 mile section of the Weatherspoon - Marion 115kV line from LREMC Hog Swamp to Fairmont tap with 795 ACSS/TW conductor.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	12/1/2025
Estimated Time to Complete	2 years
Estimated Cost	$21 M

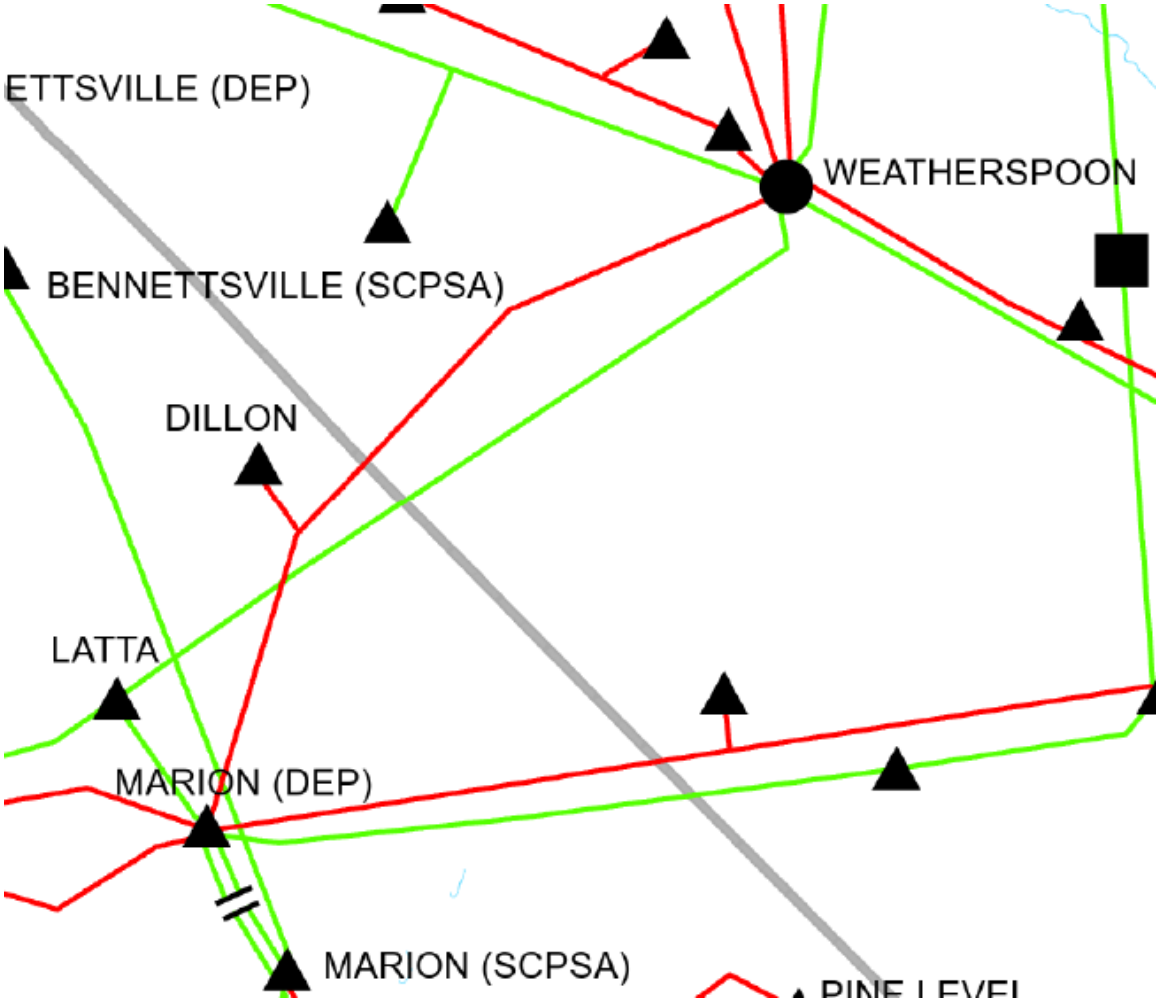
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With additional solar generation in DEP, outage of a section of the Weatherspoon – Latta 230 kV line can overload this section of the Weatherspoon – Marion 115 kV line.

Other Transmission Solutions Considered
Construct a new 115 kV line between Weatherspoon and Marion.

Why this Project was Selected as the Preferred Solution
Cost and feasibility are much improved with selected alternative.

Weatherspoon – Marion 115 kV Line, Upgrade

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Raise 115 kV line.



Project ID and Name: 0076 – Camden Junction – Wateree 115 kV Line, Rebuild

Project Description
This project consists of rebuilding the Camden Junction – Wateree 115 kV Line using 795 ACSS/TW conductor or equivalent (approximately 5.27 miles).

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	12/1/2026
Estimated Time to Complete	3 years
Estimated Cost	$16 M

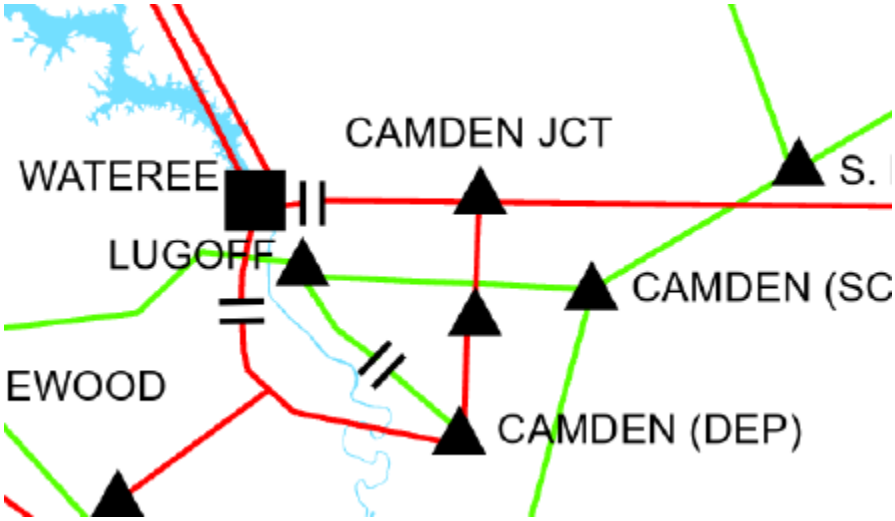
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With additional solar generation in DEP, outage of a section of the Camden – Camden Junction 115 kV line can overload this section of the Camden Junction – Wateree 115 kV Line.

Other Transmission Solutions Considered
Construct a new 115 kV line between Camden Junction and Wateree.

Why this Project was Selected as the Preferred Solution
Cost and feasibility are much improved with selected alternative.

Camden Junction – Wateree 115 kV Line, Rebuild

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 115 kV line.



Project ID and Name: 0077 – Robinson – Rockingham 115 kV Line, Rebuild

Project Description
This project consists of rebuilding the Sneedsboro Solar - Cordova - Rockingham portions of the Robinson – Rockingham 115 kV Line using 795 ACSS/TW conductor or equivalent (approximately 17 miles).

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2027
Estimated Time to Complete	3.5 years
Estimated Cost	$42 M

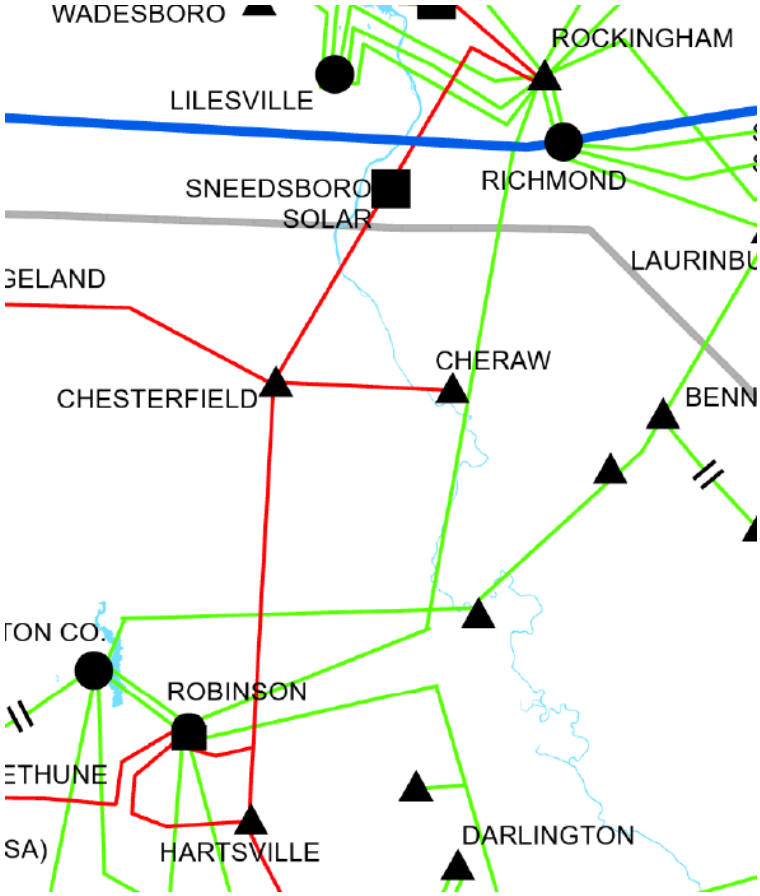
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With additional solar generation in DEP, double circuit outage of sections of the Richmond – Rockingham West 230 kV line and Robinson – Rockingham 230 kV line can overload this section of the Robinson - Rockingham 115 kV Line.

Other Transmission Solutions Considered
Construct a new 115 kV line between Robinson and Rockingham.

Why this Project was Selected as the Preferred Solution
Cost and feasibility are much improved with selected alternative.

Robinson – Rockingham 115 kV, Rebuild

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 115 kV line.



Project ID and Name: 0078 – Robinson – Rockingham 230 kV Line, Rebuild

Project Description
This project consists of rebuilding portions of the Robinson – Rockingham 230 kV Line using 6-1590 MCM ACSR conductor or equivalent (approximately 19 miles).

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2026
Estimated Time to Complete	2.5 years
Estimated Cost	$50 M

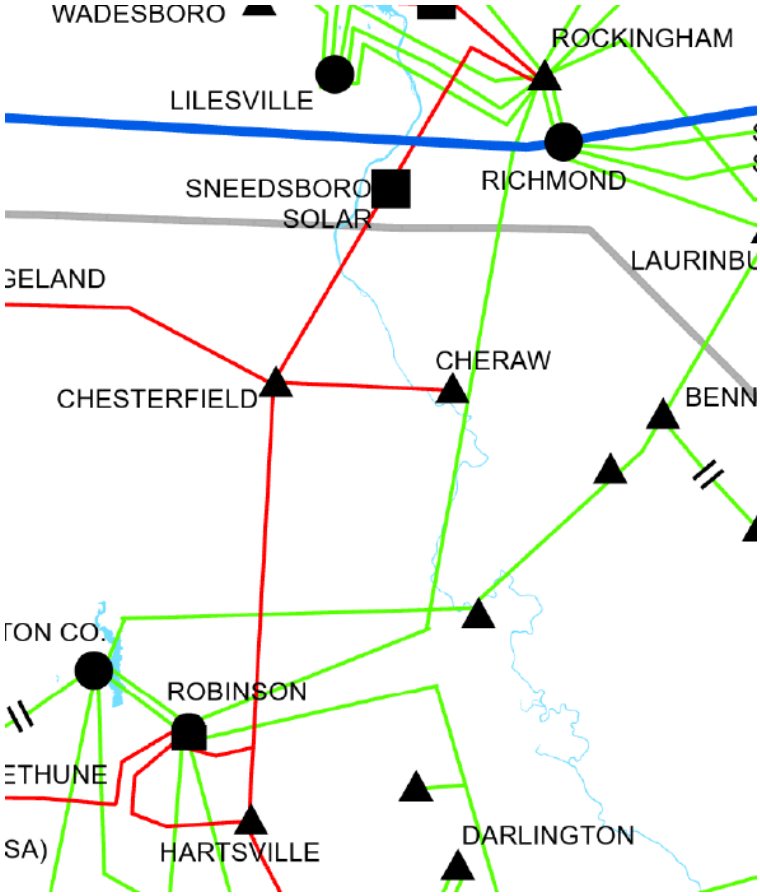
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With additional solar generation in DEP, outage of section of the Bennettsville – Laurinburg 230 kV line can overload these sections of the Robinson - Rockingham 230 kV Line.

Other Transmission Solutions Considered
Construct a new 230 kV line between Robinson and Rockingham.

Why this Project was Selected as the Preferred Solution
Cost and feasibility are much improved with selected alternative.

Robinson – Rockingham 230 kV, Rebuild

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 230 kV line.



Project ID and Name: 0079 – Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild

Project Description
This project consists of rebuilding the Fayetteville - Hope Mills Church St section of the Fayetteville – Fayetteville Dupont 115 kV Line using 795 ACSS/TW conductor or equivalent (approximately 4.9 miles).

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	6/1/2026
Estimated Time to Complete	2.5 years
Estimated Cost	$16 M

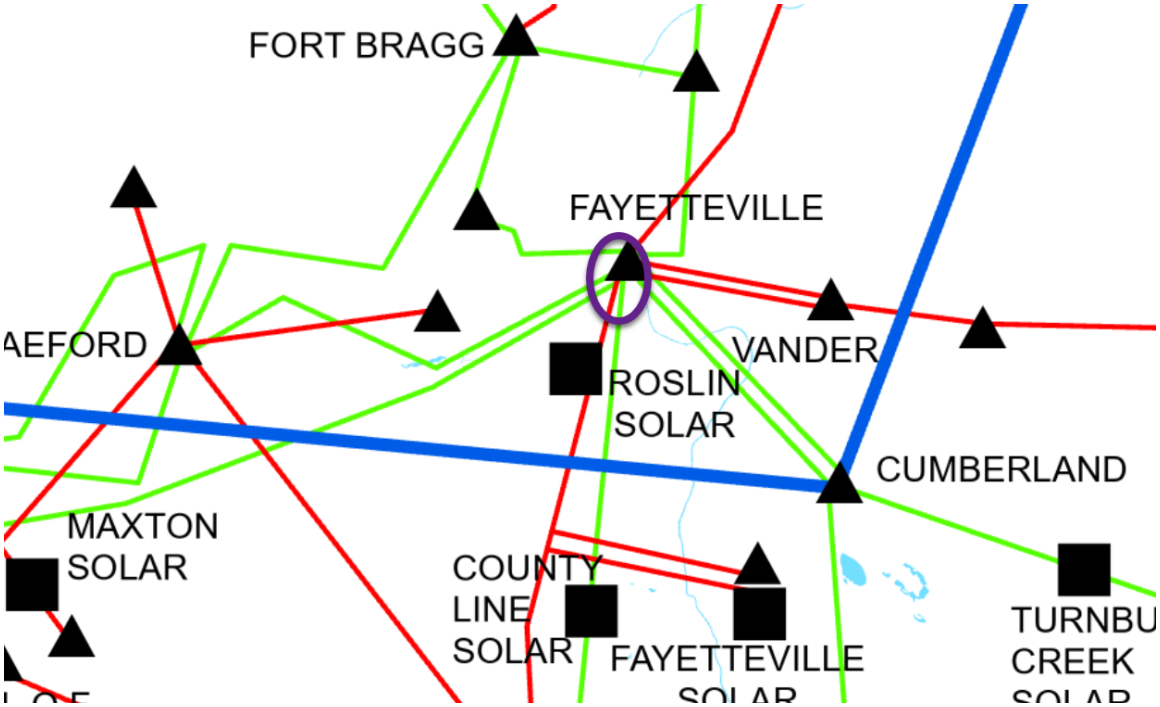
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With additional solar generation in southern DEP, outage of a section of the Weatherspoon – Fayetteville 230 kV line can overload this section of the Fayetteville – Fayetteville Dupont 115 kV line.

Other Transmission Solutions Considered
Construct a new 115 kV line between Fayetteville and Fayetteville Dupont.

Why this Project was Selected as the Preferred Solution
Cost and feasibility are much improved with selected alternative.

Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild 4.9 miles

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 115 kV line.



Project ID and Name: 0080 – Lee 100 kV Line (Lee-Shady Grove), Upgrade

Project Description
This project consists of rebuilding 11.9 miles of the existing 477 ACSR conductor with 1158 ACSS/TW.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	12/1/2025
Estimated Time to Complete	2 years
Estimated Cost	$32 M

Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With high solar penetration in the southwestern area of the DEC system, this line can overload for various contingencies.

Other Transmission Solutions Considered
New transmission line. Curtailment of solar.

Why this Project was Selected as the Preferred Solution
Reliability. Facilitates integration of higher levels of renewables.

Lee 100 kV Line (Lee-Shady Grove), Upgrade

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 100 kV line with higher capacity conductors.

Project ID and Name: 0081 – Piedmont 100 kV Line (Lee-Shady Grove), Upgrade

Project Description
This project consists of rebuilding 12.7 miles of the existing 477 ACSR conductor with 1158 ACSS/TW.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	12/1/2026
Estimated Time to Complete	3 years
Estimated Cost	$41 M

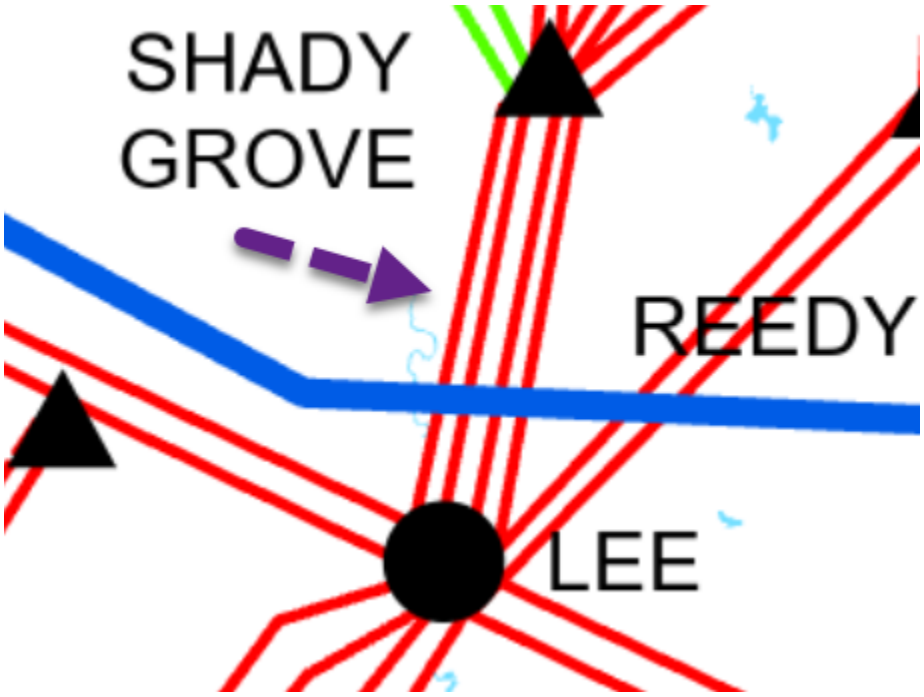
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With high solar penetration in the southwestern area of the DEC system, this line can overload for various contingencies.

Other Transmission Solutions Considered
New transmission line. Curtailment of solar.

Why this Project was Selected as the Preferred Solution
Reliability. Facilitates integration of higher levels of renewables.

Piedmont 100 kV Line (Lee-Shady Grove), Upgrade

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 100 kV line with higher capacity conductors.



Project ID and Name: 0082 – Newberry 115 kV Line (Bush River-DESC), Upgrade

Project Description
This project consists of rebuilding 11.3 miles of the existing 266 ACSR conductor with 1272 ACSR.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	6/1/2025
Estimated Time to Complete	1.5 years
Estimated Cost	$35 M

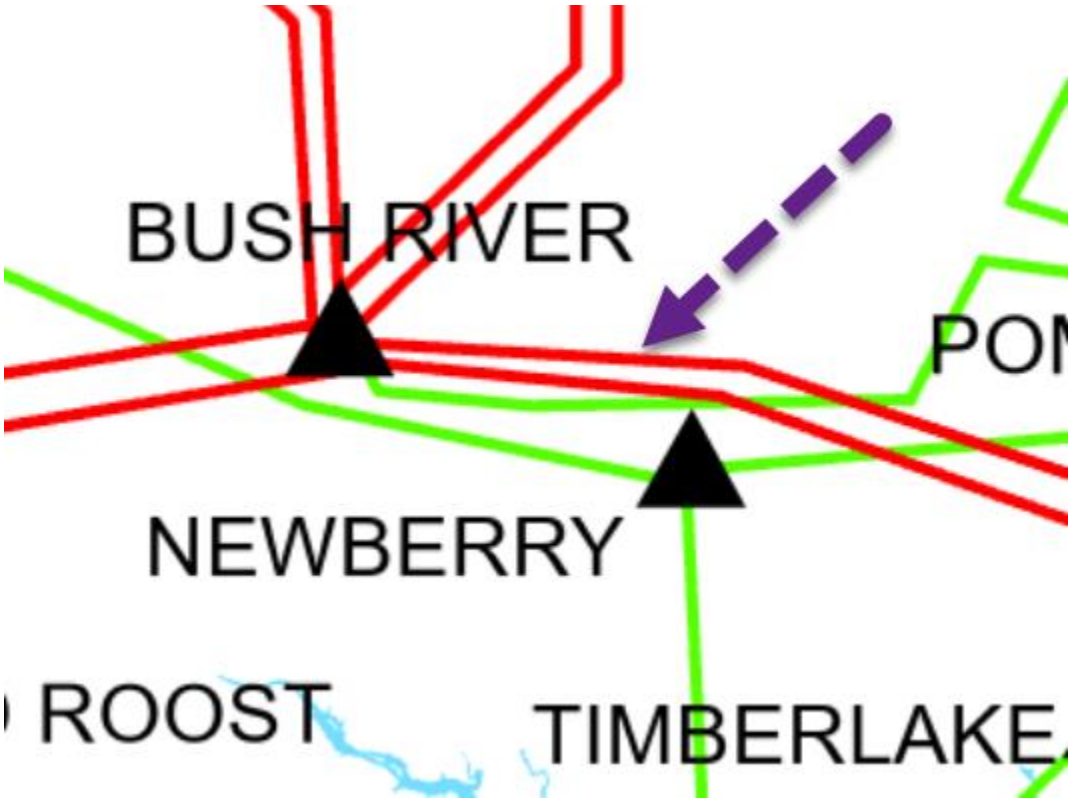
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With high solar penetration in the southwestern area of the DEC system, this line can overload for various contingencies.

Other Transmission Solutions Considered
Curtailment of solar.

Why this Project was Selected as the Preferred Solution
Reliability. Facilitates integration of higher levels of renewables.

Newberry 115 kV Line (Bush River-DESC), Upgrade

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 115 kV line with higher capacity conductors.



Project ID and Name: 0083 – Clinton 100 kV Line (Bush River-Laurens), Upgrade

Project Description
This project consists of rebuilding 29.3 miles of the existing 2/0 Cu, 336 ACSR / 477 ACSR conductor with 1158 ACSS/TW.

Status	Underway
Transmission Owner	DEC
Planned In-Service Date	12/1/2026
Estimated Time to Complete	3 years
Estimated Cost	$87 M

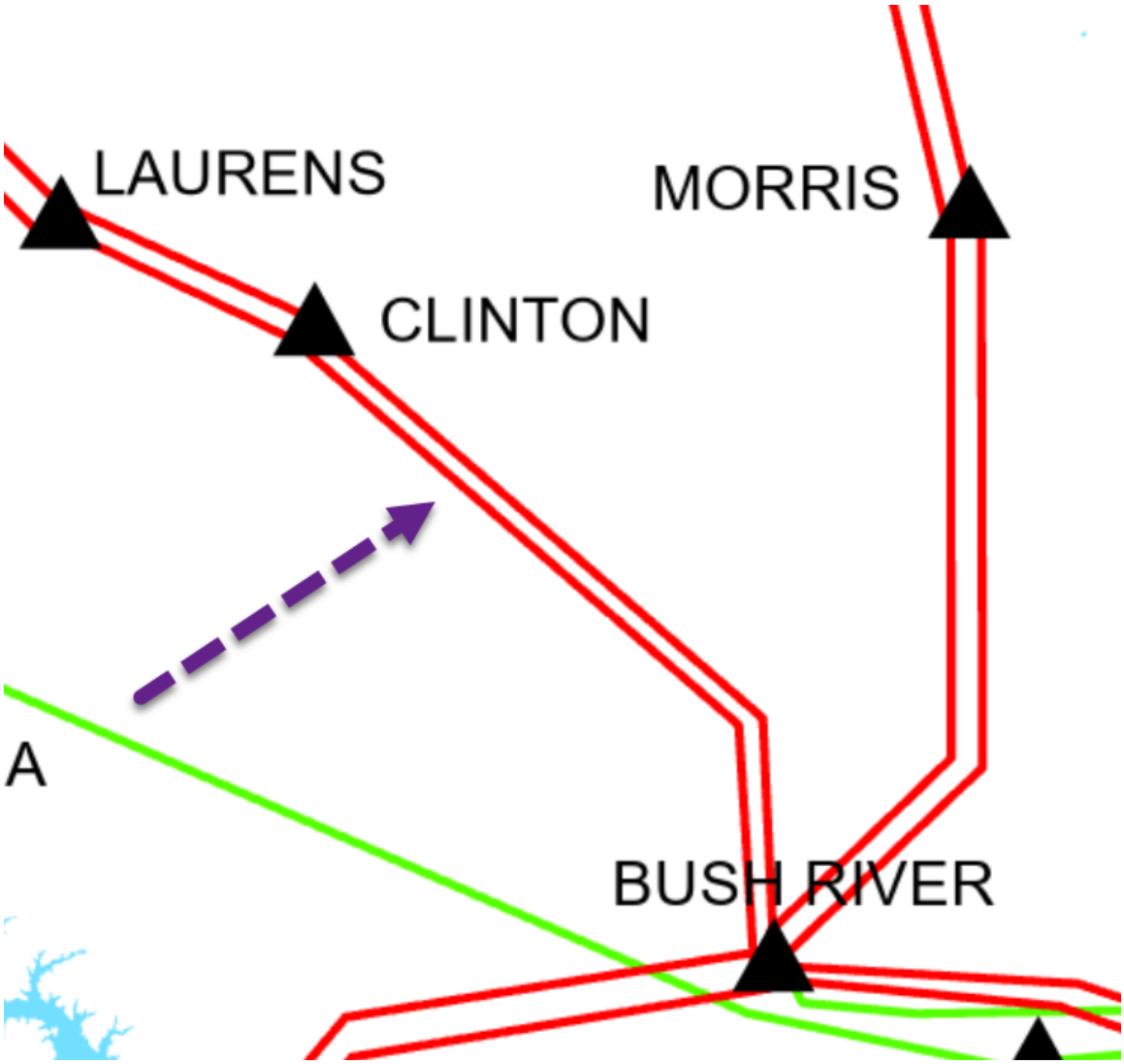
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals. With high solar penetration in the southwestern area of the DEC system, this line can overload for various contingencies.

Other Transmission Solutions Considered
Curtailment of solar. New transmission lines.

Why this Project was Selected as the Preferred Solution
Reliability. Facilitates integration of higher levels of renewables.

Clinton 100 kV Line (Bush River-Laurens), Upgrade

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 100 kV line with higher capacity conductors.



Project ID and Name: 0085 – Camden – Camden Dupont 115 kV Line, Reconductor

Project Description
Rebuild Camden – Camden Dupont 115 kV line with 795 ACSS/TW.

Status	Underway
Transmission Owner	DEP
Planned In-Service Date	12/1/2024
Estimated Time to Complete	1 year
Estimated Cost	$11 M

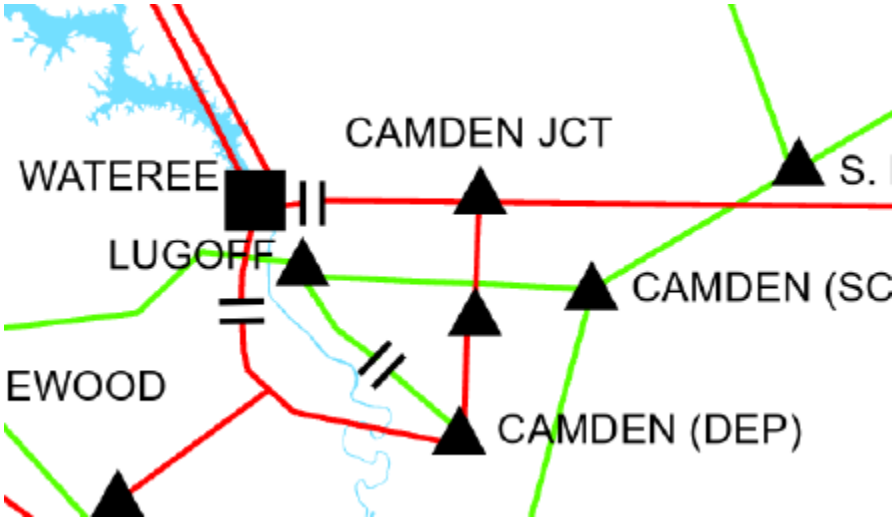
Narrative Description of the Need for this Project
Various solar studies performed have shown the need to upgrade this line. This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.

Other Transmission Solutions Considered
Construct a new 115 kV line between Camden and Camden Dupont.

Why this Project was Selected as the Preferred Solution
Cost and feasibility are much improved with selected alternative.

Camden – Camden Dupont 115 kV Line, Rebuild

- **Proactive Solar Upgrade**
- **Problem:** This upgrade is needed for future solar generation proposed for compliance with the Carbon Plan goals.
- **Solution:** Rebuild 115 kV line.



Appendix G Collaborative Plan Comparisons

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0024	Durham – RTP 230 kV Line, Reconductor	DEP	Conceptual	TBD	20	Underway	6/1/2027	20
0039	Asheboro–Asheboro East 115 kV North Line, Reconductor	DEP	In-service	12/1/2022	27	-	-	-
0046	Windmere 100 kV Line (Dan River–Sadler), Construct	DEC	Underway	6/1/2023	27	In-service	6/27/2023	28
0048	Wilkes 230/100 kV Tie Station, Construct	DEC	Underway	6/1/2024	51	Underway	12/1/2025	66
0050	Craggy – Enka 230 kV Line, Construct	DEP	Underway	12/1/2024	95	Underway	12/1/2024	94

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0051	Cokesbury 100 kV Line (Coronaca–Hodges), Upgrade	DEC	Planned	12/1/2025	22	Planned	12/1/2025	26
0052	South Point 100 kV Switching Station, Construct	DEC	Underway	12/1/2025	109	Underway	12/1/2025	102
0053	Wateree Hydro Plant, Upgrade	DEP	In-service	12/1/2023	16	In-Service	12/1/2023	16
0054	Carthage 230/115 kV Substation, Construct	DEP	Underway	6/1/2026	27	Underway	6/1/2026	28
0056	Castle Hayne – Folkstone115 kV Line, Rebuild	DEP	Underway	12/1/2025	95	Underway	6/1/2026	97

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0057	Holly Ridge North 115 kV Switching Station, Construct	DEP	Underway	12/1/2026	12	Underway	12/1/2026	12
0058	Coronaca 100 kV Line (Coronaca-Creto), Upgrade and Construct	DEC	Planned	12/1/2026	18	Underway	6/1/2026	38
0059	Monroe 100 kV Line (Lancaster-Monroe), Upgrade	DEC	Underway	12/1/2027	74	Underway	12/1/2027	73
0060	Westport 230 kV Line (McGuire-Marshall), Upgrade	DEC	Conceptual	TBD	48	Conceptual	TBD	43
0061	Wateree 100 kV Line (Great Falls-Wateree), Upgrade	DEC	Underway	6/1/2024	5	Underway	6/1/2024	11

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0062	Silas 100 kV Line (Mocksville-Idols Tap), Upgrade	DEC	Underway	6/1/2025	21	In-service	6/13/2023	24
0063	North Greenville 230 kV Tie Station, Upgrade	DEC	Underway	12/1/2025	21	Underway	12/1/2025	23
0064	Wylie 100 kV Line (Wylie-Arrowood Retail), Upgrade	DEC	Underway	12/1/2026	13	Underway	12/1/2026	15
0065	Morning Star 230 kV Tie Station, Upgrade	DEC	Planned	12/1/2032	35	Planned	12/1/2032	38
0066	Davidson River 100 kV Line (North Greenville-Marietta), Upgrade	DEC	Planned	12/1/2030	19	Planned	12/1/2030	17

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0067	Harley 100 kV Line (Tiger-Campobello), Upgrade	DEC	Conceptual	TBD	45	Conceptual	TBD	45
0068	Sandy Ridge 230 kV Line (Newport-Morning Star), Upgrade	DEC	Planned	12/1/2029	36	Planned	12/1/2029	34
0069	Skybrook 100 kV Line (Winecoff-Eastfield Retail), Upgrade	DEC	Conceptual	TBD	16	Conceptual	TBD	15
0070	Cape Fear – West End 230 kV Line, Rebuild	DEP	Underway	6/1/2026	83	Underway	6/1/2026	58
0071	Erwin – Fayetteville East 230 kV Line, Rebuild	DEP	Underway	6/1/2026	96	Underway	6/1/2026	61

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0072	Erwin – Fayetteville 115 kV Line, Rebuild	DEP	Underway	6/1/2025	24	Underway	6/1/2025	21
0073	Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild	DEP	Underway	12/1/2024	14	Underway	12/1/2024	7
0074	Milburnie 230 kV Substation, Upgrade	DEP	Underway	6/1/2026	5	Underway	6/1/2026	5
0075	Weatherspoon – Marion 115 kV Line, Upgrade	DEP	Underway	12/1/2025	21	Underway	12/12/2025	21
0076	Camden Junction – Wateree 115 kV Line, Rebuild	DEP	Underway	12/1/2026	16	Underway	12/1/2026	16
0077	Robinson Plant – - Rockingham 115 kV Line, Rebuild	DEP	Underway	6/1/2027	42	Underway	6/1/2027	42

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0078	Robinson Plant – Rockingham 230 kV Line, Upgrade	DEP	Underway	6/1/2026	49	Underway	6/8/2026	50
0079	Fayetteville – Fayetteville Dupont 115 kV Line, Rebuild	DEP	Underway	6/1/2026	16	Underway	4/16/2026	16
0080	Lee 100 kV Line (Lee-Shady Grove), Upgrade	DEC	Underway	12/1/2025	40	Underway	12/1/2025	32
0081	Piedmont 100 kV Line (Lee-Shady Grove), Upgrade	DEC	Underway	12/1/2026	40	Underway	12/1/2026	41
0082	Newberry 115 kV Line (Bush River-DESC), Upgrade	DEC	Underway	12/1/2025	35	Underway	6/1/2025	35
0083	Clinton 100 kV Line (Bush River-Laurens), Upgrade	DEC	Underway	12/1/2026	86	Underway	12/1/2026	87
0085	Camden – Camden Dupont 115 kV Line, Reconductor	DEP	Underway	12/1/2024	9	Underway	12/1/2024	11

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0086	Parkwood Tie 500/230 kV Bank 5, Replace	DEC	-	-	-	Underway	12/1/2024	42
0087	Breaker Station on Motley 100 kV Line for New Customer, Construct	DEC	-	-	-	Underway	6/1/2025	12
0088	Island Creek 44 kV, Conversion	DEC	-	-	-	Underway	6/1/2025	15
0089	McDowell Tie 230/100 kV Bank 2, Replace	DEC	-	-	-	Underway	6/1/2025	12
0090	Boyd Switching Station, Construct	DEC	-	-	-	Underway	6/1/2026	42
0091	Haas Creek Switching Station, Construct	DEC	-	-	-	Underway	6/1/2026	44
0092	Lyle Creek Switching Station, Construct	DEC	-	-	-	Underway	6/1/2026	53

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0093	Page and Guilford 100 kV Lines (Greensboro-North Greensboro), Upgrade	DEC	-	-	-	Planned	12/1/2026	17
0094	Cabarrus 100 kV Line (Wildcat-Westfork), Upgrade	DEC	-	-	-	Conceptual	TBD	13
0095	Sevier 100 kV Line (East Greenville-Verdae Retail Tap), Upgrade	DEC	-	-	-	Underway	12/1/2026	20
0096	Panther 100 kV Line (EMC Corp-Stallings Rd Retail), Network	DEC	-	-	-	Conceptual	TBD	56
0097	Dan River 100 kV Line (Dan River-North Greensboro), Upgrade	DEC	-	-	-	Conceptual	TBD	87
0098	Oliver 230 kV Line (Marshall-Boyd), Upgrade	DEC	-	-	-	Conceptual	TBD	60

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0099	Reidsville and Wolf Creek 100 kV Lines (Dan River-Sadler), Upgrade	DEC	-	-	-	Conceptual	TBD	37
0100	Beulah 100 kV Line (Lookout-EnergyUnited Del 18), Upgrade	DEC	-	-	-	Conceptual	TBD	21
0101	Hinkle 100 kV Line (Stamey-Statesville), Upgrade	DEC	-	-	-	Conceptual	TBD	22
0102	Concord 100 kV Line (Concord-Concord City Del 3), Upgrade	DEC	-	-	-	Conceptual	TBD	11
0103	Crab Orchard 100 kV Line (Harrisburg-Amity), Upgrade	DEC	-	-	-	Planned	12/1/2028	15
0104	Hands Mill Switching Station, Construct	DEC	-	-	-	Underway	6/1/2027	51

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0105	Kennedy 100 kV Line (Orchard-Newton Tap), Upgrade	DEC	-	-	-	Conceptual	TBD	11
0107	Buckhorn 44 kV Line, Conversion	DEC	-	-	-	Underway	12/1/2024	11
0108	Messer 230 kV Line (Dixon School Rd-Customer), Construct	DEC	-	-	-	Planned	12/1/2026	14
0109	Terrell 44 kV Line, Conversion	DEC	-	-	-	Conceptual	TBD	26
0110	Troutman 44 kV Line, Conversion	DEC	-	-	-	Planned	6/1/2027	30
0115	Havelock 230/115 kV Banks 1 & 2, Replace	DEP	-	-	-	Underway	6/1/2024	10
0116	Rocky Mount – Battleboro 115 kV Line, Reconductor	DEP	-	-	-	Underway	6/1/2025	30

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0117	Asheville Plant – Oteen 115 kV West Line (Arden), Construct	DEP	-	-	-	Underway	6/1/2026	12
0118	Weatherspoon – LOF 115 kV Line (Weatherspoon-LREMC West Lumberton), Reconductor	DEP	-	-	-	Underway	12/1/2026	27
0119	Weatherspoon – LOF 115 kV Line (Maxton-Pembroke), Reconductor	DEP	-	-	-	Underway	6/1/2026	26
0120	Sumter – SCEG Eastover 115 kV Line (Kings Hwy – Shaw Field – Eastover), Reconductor	DEP	-	-	-	Underway	6/1/2027	19
0121	Brush Creek, Construct STATCOM	DEP	-	-	-	Underway	12/1/2028	40

NCTPC Update on Major Projects Red items are changes from the previous report; In-Service Date (±) 6 Months; Cost (±) $1M								
			2022 Plan[1]			2023 Plan		
Project ID	Reliability Project	Transmission Owner	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]	Status[2]	Projected In-Service Date	Estimated Cost ($M)[3]
0122	Asheboro – Siler City 115 kV Line, Reconductor	DEP	-	-	-	Underway	12/1/2028	75
0123	Falls – Franklinton (Franklinton – Franklinton Novo 115 kV Feeder), Construct	DEP	-	-	-	Conceptual	TBD	16
0124	Castle Hayne-Folkstone 230 kV Line – Porters Neck 230 kV Tap Line, Construct	DEP	-	-	-	Underway	6/1/2024	43
0125	Method – Milburnie 115 kV North Line, Reconductor	DEP	-	-	-	Planned	6/1/2033	25
0126	Rockingham - West End 230 kV West Line, Reconductor	DEP	-	-	-	Conceptual	TBD	27
TOTAL					**1.464**			**2,440**

[1] Information based upon the mid-year plan report dated July 24, 2023. Originally reported in Appendix C of the NCTPC 2022–2032 Collaborative Transmission Plan" dated February 21, 2023.

[2] Status: ***In-service****:* Projects with this status are in-service. This status was updated as of 12/1/2023.

Underway*:* Projects with this status range from the Transmission Owner having some money in its current year budget for the project to the Transmission Owner having completed some construction activities for the project.

Planned*:* Projects with this status do not have money in the Transmission Owner's current year budget; and the project is subject to change.

Conceptual*:* Projects with this status are not p*lanned* at this time but will continue to be evaluated as a potential project in the future.

Deferred*:* Projects with this status were identified in the 2021 Report and have been deferred beyond the end of the planning horizon based on analysis performed to develop the 2022 Collaborative Transmission Plan.

Removed: Project is cancelled and no longer in the plan

[3] The estimated cost is in nominal dollars which reflects the sum of the estimated annual cash flows over the expected development period for the specific project (typically 2 – 5 years), including direct costs, loadings and overheads; but not including AFUDC. Each year's cash flow is escalated to the year of the expenditures. The sum of the expected cash flows is the estimated cost.

Appendix H
Acronyms

ACRONYMS

ACSR	Aluminum Conductor Steel Reinforced
ACSS/TW	Aluminum Conductor Steel Supported/Trapezoidal Wire
AEP	American Electric Power
AFUDC	Allowance for Funds Used During Construction
BAA	Balancing Authority Area
CC	Combined Cycle
CPLE	Carolina Power & Light East, or DEP East
CPLW	Carolina Power & Light West, or DEP West
CT	Combustion Turbine
DEC	Duke Energy Carolinas
DEP	Duke Energy Progress
DNR	Designated Network Resource
DVP	Dominion Virginia Power
ERAG	Eastern Interconnection Reliability Assessment Group
EU	Energy United
FERC	Federal Energy Regulatory Commission
FSA	Facilities Study Agreement
ISA	Interconnection Service Agreement
KMEC	Kings Mountain Energy Center
kV	Kilovolt
LGIA	Large Generator Interconnection Agreement
LSE	Load Serving Entity
LTWG	SERC Long-Term Working Group
M	Million
MCM	Thousand Circular Mils
MMWG	Multiregional Modeling Working Group
MVA	Megavolt-Ampere
MVAR	Megavolt-Ampere Reactive
MW	Megawatt
NCEMC	North Carolina Electric Membership Corporation
NCEMPA	North Carolina Eastern Municipal Power Agency

NCMPA1	North Carolina Municipal Power Agency Number 1
NCTPC	North Carolina Transmission Planning Collaborative
NCUC	North Carolina Utilities Commission
NERC	North American Electric Reliability Corporation
NTE	NTE Energy
OASIS	Open Access Same-time Information System
OATT	Open Access Transmission Tariff
OSC	Oversight Steering Committee
OTDF	Outage Transfer Distribution Factor
PJM	PJM Interconnection, LLC
PMPA	Piedmont Municipal Power Agency
POD	Point of Delivery
PSS/E	Power System Simulator for Engineering
PV	Photovoltaic (Solar)
PWG	Planning Working Group
RZEP	Red Zone Expansion Plan
ROW	Right of Way
RTP	Research Triangle Park
SCEG	South Carolina Electric & Gas Company / Dominion Energy South Carolina
SCPSA	South Carolina Public Service Authority
SE	Steam Electric (Plant)
SEPA	Southeastern Power Administration
SERC	SERC Reliability Corporation
SOCO	Southern Company
SS	Switching Station
SVC	Static VAR Compensator
TAG	Transmission Advisory Group
TRM	Transmission Reliability Margin
TSR	Transmission Service Request
TTC	Total Transfer Capability
TVA	Tennessee Valley Authority

VACAR	Virginia-Carolinas Reliability Agreement
VAR	Volt Ampere Reactive