



Carolinas Transmission Planning Collaborative

2025 Study Scope

Purpose of Study

The purpose of the Base Reliability Study is to assess the Duke Energy Carolinas (“DEC”) and Duke Energy Progress (“DEP”) transmission systems’ reliability and develop a single collaborative transmission plan for the DEC and DEP transmission systems that ensures reliability of service in accordance with NERC, SERC, DEC, and DEP requirements. In addition, the study will also assess Local Economic Study and/or Public Policy Study requests provided by the Transmission Advisory Group (“TAG”) and approved for study by the Oversight Steering Committee (“OSC”). Multi-Value Strategic Transmission (“MVST”) Study requests will be addressed in a separate scope document in years which an MVST Study is undertaken. The Planning Working Group (“PWG”) will perform the technical analysis outlined in this study scope under the guidance and direction of the OSC in compliance with the currently effective version of Attachment N-1 to the Duke Energy Joint OATT.

One Local Economic Study request was received from TAG stakeholders by the deadline for the 2025 study year (“2025 Study”). NCEMC submitted a request to study load growth in the DEP and DEC areas as forecasted in the CPIRP. The intent of this study is to determine what types of network upgrades will be required to serve some large point loads that may be associated with this load growth.

One Public Policy Study request was received from TAG stakeholders by the deadline for the 2025 study year (“2025 Study”). CEBA submitted a public policy study request to study the City of Charlotte actively pursuing its goal to source 100% of its energy use in buildings and fleet from zero-carbon sources by 2030. Discussions between CTPC and CEBA suggest that the request aligns more closely with Distribution Planning rather than Transmission Planning. As a result of these discussions, it was decided that the study request will not be included in the current cycle of CTPC work.

Overview of the Study Process Scope

The scope of the proposed study process will include the following steps:

1. Study Assumptions

- Study assumptions selected.

2. Study Criteria

- Establish the criteria by which the study results will be measured.

3. Case Development

- Develop the models needed to perform the study.
- Determine the different resource supply scenarios to evaluate.

4. Methodology

- Determine the methodologies that will be used to carry out the study.

5. Technical Analysis and Study Results

- Perform the study analysis and produce the results. Initially, power flow analyses will be performed based on the assumption that thermal limits will be the controlling limit for the reliability plan. Voltage, stability, short circuit and phase angle studies may be performed if circumstances warrant.

6. Assessment and Problem Identification

- Evaluate the results to identify problems/issues.

7. Solution Development

- Identify potential solutions to the problems/issues.
- Test the effectiveness of the potential solutions through additional studies and modify the solutions as necessary such that all reliability criteria are met.
- Perform a financial analysis and rough scheduling estimate for each of the proposed solutions (e.g., cost, cash flow, present value).

8. Selection of a Recommended Collaborative Transmission Plan

- Compare alternatives and select the preferred solution alternatives – balancing cost, benefits and risks.
- Select a preferred set of transmission improvements that provide a reliable transmission system to customers most cost effectively while prudently managing the associated risks.

9. Report on the Study Results

- Prepare a report on the recommended Collaborative Transmission Plan.

Each of these study steps is described in more specific detail below.

Study Assumptions

The specific assumptions selected for the 2025 Study are:

- The years to be studied (study years) will be 2030 Summer and 2030/2031 Winter for a near term reliability analysis and 2035 Summer and 2035/2036 Winter for a longer-term reliability analysis. Each Load Serving Entity (“LSE”) will provide a list of resource supply assumptions and include the resource dispatch order for each of its Designated Network Resources in the DEC and DEP Balancing Authority Areas. Generation will be dispatched for each LSE in the cases to meet that LSE’s peak load in accordance with the designated dispatch order. LSEs will also include generation down scenarios for their resources, if applicable (e.g., generation outage with description of how generation will be replaced, such as by that LSE’s dispatch order).
- PSS/E and/or TARA will be used for the study.
- Generation, load, interchange and other assumptions will be coordinated between Participants as needed.
- The tables below list the major generation facility additions and retirements assumed to occur by 2030 Summer, 2030/2031 Winter, 2035 Summer and 2035/2036 Winter.
- The retirements and resource additions modeled in the study are generally based on the P3 Fall Base portfolio in the IRP approved by the North Carolina Utilities Commission in its November 1, 2024 Order and, in the IRP approved by the Public Service Commission of South Carolina in its November 25, 2024 Order.
- “Surplus” indicates surplus interconnection service, which is defined in the Duke Energy Joint OATT and shall mean any unneeded portion of Interconnection Service established in a Large Generator Interconnection Agreement, such that if Surplus Interconnection Service is utilized the total amount of Interconnection Service at the Point of Interconnection would remain the same.
- Any assumptions or details unique to the Local Economic Study and/or Public Policy Study within this scope document are listed below.
 - If unaddressed, assumptions from the Base Reliability Study are used.

Major Generation¹ Facility Additions in 2025 Study

Includes facilities with a signed Interconnection Agreement (IA) as of 5/31/2025. Additional queued generation (e.g. Person County CC 2, etc.) that does not have a signed IA as of 5/31/2025 is not included in the 2025 Reliability Study.

Company	Generation Facility	2030S	2030/30W	2035S	2035/36W
DEC	Allen Battery (50 MW)	Included	Included	Included	Included
DEC	Apex Solar (28.9 MW)	Included	Included	Included	Included
DEC	Bear Branch Solar (34.5 MW)	Included	Included	Included	Included
DEC	Bear Claw Solar (28.25 MW)	Included	Included	Included	Included
DEC	Beaverdam Solar (40.8 MW)	Included	Included	Included	Included
DEC	Brookcliff Solar (50 MW)	Included	Included	Included	Included
DEC	Bush River Solar (45 MW)	Included	Included	Included	Included
DEC	Clark Creek Solar (40 MW) with 14 MW of Storage^	Included	Included	Included	Included
DEC	Five Circles Solar (74.9 MW)	Included	Included	Included	Included
DEC	Foster Mill Solar (54 MW)	Included	Included	Included	Included
DEC	Granite Battery (197 MW)	Included	Included	Included	Included
DEC	Healing Springs Solar (55 MW)	Included	Included	Included	Included
DEC	Hornet Solar (73 MW)	Included	Included	Included	Included
DEC	Hudson Place Solar (70.7 MW)	Included	Included	Included	Included
DEC	Joanna White Solar (37.5 MW)	Included	Included	Included	Included
DEC	Marshall CT 1, 2 (780 MW)	Included	Included	Included	Included
DEC	Monroe Battery (Surplus 25 MW) *	Included	Included	Included	Included
DEC	Newberry Solar (74.5 MW)	Included	Included	Included	Included

¹ Major Generation is 10 MW or greater and connected to the transmission system.

Company	Generation Facility	2030S	2030/30W	2035S	2035/36W
DEC	Pelham Solar (32 MW)	Included	Included	Included	Included
DEC	Baxter Creek Solar (30 MW) ²	Included	Included	Included	Included
DEC	Quaker Creek Farm Solar (35 MW)	Included	Included	Included	Included
DEC	Riverbend Battery (115 MW)	Included	Included	Included	Included
DEC	Rutabaga Solar (69.75 MW)	Included	Included	Included	Included
DEC	South Davidson Solar (80 MW)	Included	Included	Included	Included
DEC	Sweetwater Solar (34 MW)	Included	Included	Included	Included
DEC	Two Hearted Solar (22 MW)	Included	Included	Included	Included
DEC	Tyger Solar (74.99 MW) with 28 MW of Storage [^]	Included	Included	Included	Included
DEC	West River Solar (40 MW)	Included	Included	Included	Included
DEC	Wilson Bridge Solar (72 MW)	Included	Included	Included	Included
DEP	Asheville Battery (17.25 MW)	Included	Included	Included	Included
DEP	Asheville Solar (9.5 MW)	Included	Included	Included	Included
DEP	Asheville 115 CC IC5 & ST6 Uprate (19.9 MW)	Included	Included	Included	Included
DEP	Asheville 230 CC IC7 & ST8 Uprate (19.9 MW)	Included	Included	Included	Included
DEP	B&K Solar (74.9 MW)	Included	Included	Included	Included
DEP	Craggy Battery (30.5 MW)	Included	Included	Included	Included
DEP	Creed Solar (48 MW)	Included	Included	Included	Included
DEP	Culpepper Solar (74.9 MW)	Included	Included	Included	Included
DEP	Elm City Battery (Surplus 21.9 MW)*	Included	Included	Included	Included
DEP	Gum Swamp Solar (80 MW)	Included	Included	Included	Included

² This project was formerly known as Quail Solar.

Company	Generation Facility	2030S	2030/30W	2035S	2035/36W
DEP	Hyco Solar (80 MW)	Included	Included	Included	Included
DEP	IP Solar (75 MW)	Included	Included	Included	Included
DEP	Juniper Solar (74.9 MW)	Included	Included	Included	Included
DEP	Knightdale Battery (100 MW)	Included	Included	Included	Included
DEP	Loftins Crossroads (75 MW)	Included	Included	Included	Included
DEP	Lotus Solar (75 MW)	Included	Included	Included	Included
DEP	Maple Leaf Solar (73 MW)	Included	Included	Included	Included
DEP	Martins Crossroads Solar (74.9 MW)	Included	Included	Included	Included
DEP	New Hill Battery (56 MW)	Included	Included	Included	Included
DEP	Panola Solar (67 MW)	Included	Included	Included	Included
DEP	Person County CC1 (1,091 MW)	Included	Included	Included	Included
DEP	Pig Basket Creek (80 MW)	Included	Included	Included	Included
DEP	Robinson Solar (76 MW)	Included	Included	Included	Included
DEP	Rollins Solar (74.9 MW)	Included	Included	Included	Included
DEP	Plumfield Solar (74.9 MW)	Included	Included	Included	Included
DEP	Stevens Mill Solar (80 MW)	Included	Included	Included	Included
DEP	Shorthorn Solar (60 MW)	Included	Included	Included	Included
DEP	Sleepy Creek Solar (80 MW)	Included	Included	Included	Included

*Utilizing the FERC Surplus Interconnection Process

^For solar paired with storage resources, the value in parenthesis is the interconnection limit

Major Generation³ Facility Retirements in 2025 Study

Company	Generation Facility	2030S	2030/31W	2035S	2035/36W
DEC	Allen 1 (167 MW) – Generator Replacement Request (GRR) approved	Retired	Retired	Retired	Retired
DEC	Allen 5 (259 MW)	Retired	Retired	Retired	Retired
DEC	Marshall 1&2 (780 MW) –GRR approved	Retired	Retired	Retired	Retired
DEP	Blewett CTs 1-4 and Weatherspoon CTs 1- 4 (232 MW)	Retired	Retired	Retired	Retired
DEP	Roxboro 1&4 (1091 MW) – GRR approved	Retired	Retired	Retired	Retired

The specific assumptions selected for the 2025 Local Economic Study are:

- No specific resources were provided for generation assumptions.
 - Additional transfers from DEC to DEP and possible additional transfers from neighboring utilities may be needed to provide enough generation to support this load.
- A 2030 summer peak case and a 2030/31 winter peak case will be studied.
- NCEMC-provided information for specific locations and the amount of MWs of load to be added at each location, which will be studied in clusters:

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

Hypothetical Loads in 2025 Local Economic Study

Site Name	Load	Latitude	Longitude
Hoke County Regional Industrial Park	500	34.94657	-79.15049
Atlantic Gateway Logistics Park	100	34.94825	-79.90368
Farmville Corporate Park	500	35.58449	-77.60721
Twin Oaks	50	36.39516	-80.78425
AirPark – Duplin Co Business/Industry Center	50	35.00051	-77.98401
COMtech Business Park	200	34.65271	-79.15767
Energy Way	500	34.84026	-79.72944
SouthPark	200	34.7435	-77.9768
Highway 72 Industrial Site	200	34.65069	-79.09948
Blueberry Road	500	34.40346	-78.04761
Triangle North Franklin	100	36.32017	-78.54803
Atlantic Logistics Park	100	34.59321	-79.05203
Joe’s Creek CSX	500	34.847921	-79.6209368
Braswell North B	200	34.38452	-78.8449459
North Hallsboro	200	34.36224	-78.5983599
Cape Fear Expansion Site	200	34.359034	-78.2423952

Study Criteria

The study criteria used will promote consistency in the planning criteria used across the systems of the Participants, while recognizing differences between individual systems. The study criteria will consider the following reliability elements:

- NERC Reliability Standard requirements
- SERC requirements
- Individual company criteria (voltage, thermal, stability, short circuit and phase angle)

Case Development

- The most current MMWG system models will be used for the systems external to DEC and DEP as a starting point for the Base Case.
- The Base Case will include the detailed internal models for DEC and DEP and will include current transmission additions planned to be in-service for the given year (e.g., in-service by summer 2035 for 2035S cases and in-service by the winter 2035/36 for 2035/36W cases).
- An “All Firm Transmission” Case(s) will be developed which will consider all confirmed DEC and DEP long term firm transmission reservations with roll-over rights applicable to the study year(s).
- DEC and DEP will each create their respective generation down cases from the common Base Case and share the relevant cases with each other.

Study Methodology

DEC and DEP will exchange contingency and monitored element files so that each can test the impact of the other company’s contingencies on its transmission system. Initially, power flow analyses will be performed based on the assumption that thermal limits will be the controlling limit for the reliability plan. Voltage, stability, short circuit and phase angle studies may be performed if circumstances warrant.

Technical Analysis and Study Results

The technical analysis will be performed in accordance with the study methodology. Results from the technical analysis will be reported throughout the study area to identify transmission elements approaching their limits such that all Participants are aware of potential issues and appropriate steps can be identified to correct these issues, including the potential of identifying previously undetected problems.

DEC and DEP will report results throughout the study area based on:

- Thermal loadings greater than 95%.

Assessment and Problem Identification

- Each utility will utilize its own reliability criteria for its own transmission facilities. Each utility will document the reliability problems resulting from its assessments. These results will be reviewed and discussed with the TAG for feedback.

Solution Development

- The PWG will develop potential solution alternatives to the identified reliability problems.
- The TAG will have the opportunity to propose solution alternatives to the identified reliability problems.
- DEC and DEP will evaluate the effectiveness of the potential solution alternatives using the same cases, methodologies, assumptions and criteria described above.
- DEC and DEP will develop rough, planning-level cost estimates and construction schedules for the solution alternatives.

Selection of a Recommended Collaborative Transmission Plan

- The PWG will compare alternatives and select the preferred solution alternatives, balancing costs, benefits, and risks.
- The PWG will select a preferred set of transmission improvements that provides a reliable and cost-effective transmission solution to meet customers' needs while prudently managing the associated risks.
- The preferred set of transmission improvements developed by the PWG will be reviewed and discussed with the TAG for feedback.

Report on the Study Results

The PWG will compile all the study results and prepare a recommended collaborative plan for OSC review and approval. Prior to the OSC's final review and approval, the final draft of the study report will be reviewed and discussed with the TAG members to solicit their input on the recommended collaborative plan. The final report will include a comprehensive summary of all the study activities as well as the recommended transmission improvements including estimates of costs and construction schedules.