PJM – SERTP
Regional Transmission Plan Review

Order 1000 Biennial Regional Transmission Plan Review Meeting –Presentation 2 of 2

September 3, 2024

Zoom

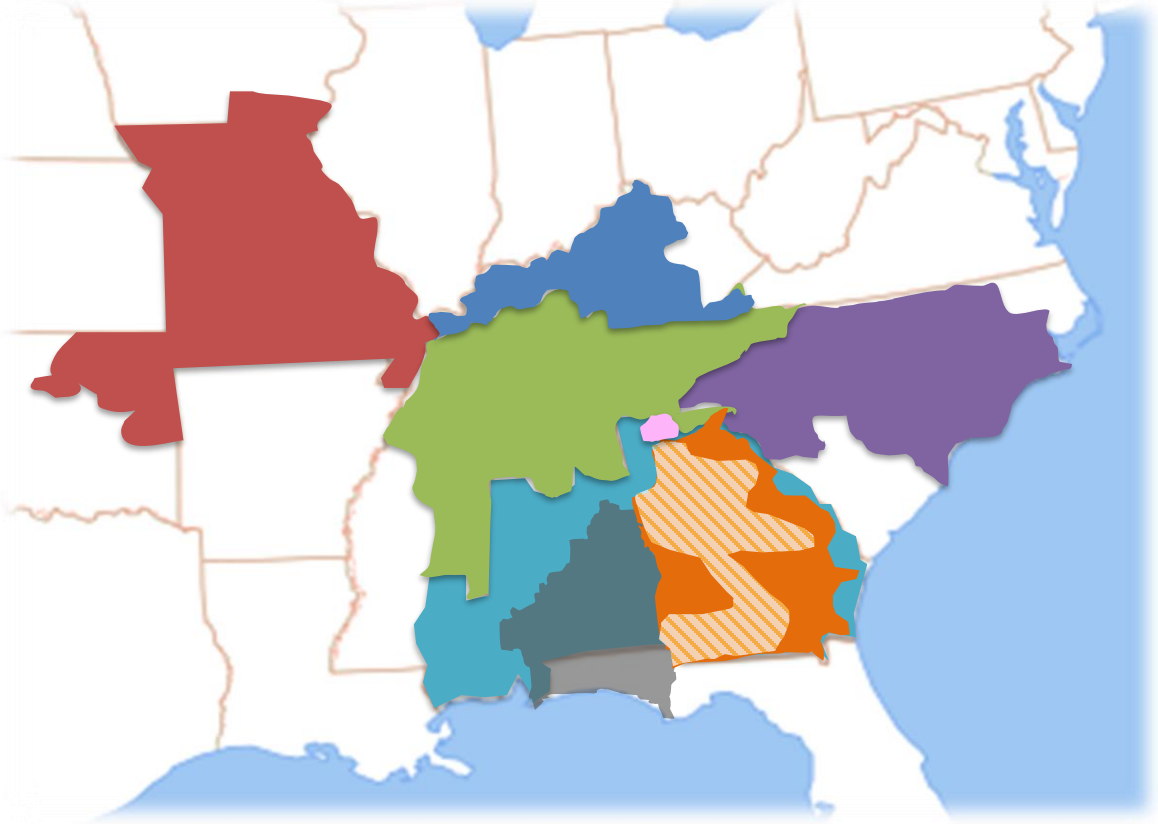
Southeastern Regional TRANSMISSION PLANNING

PJM – SERTP Interregional

Agenda

- SERTP Modeling Input Assumptions
- 2024 SERTP Regional Transmission Plan

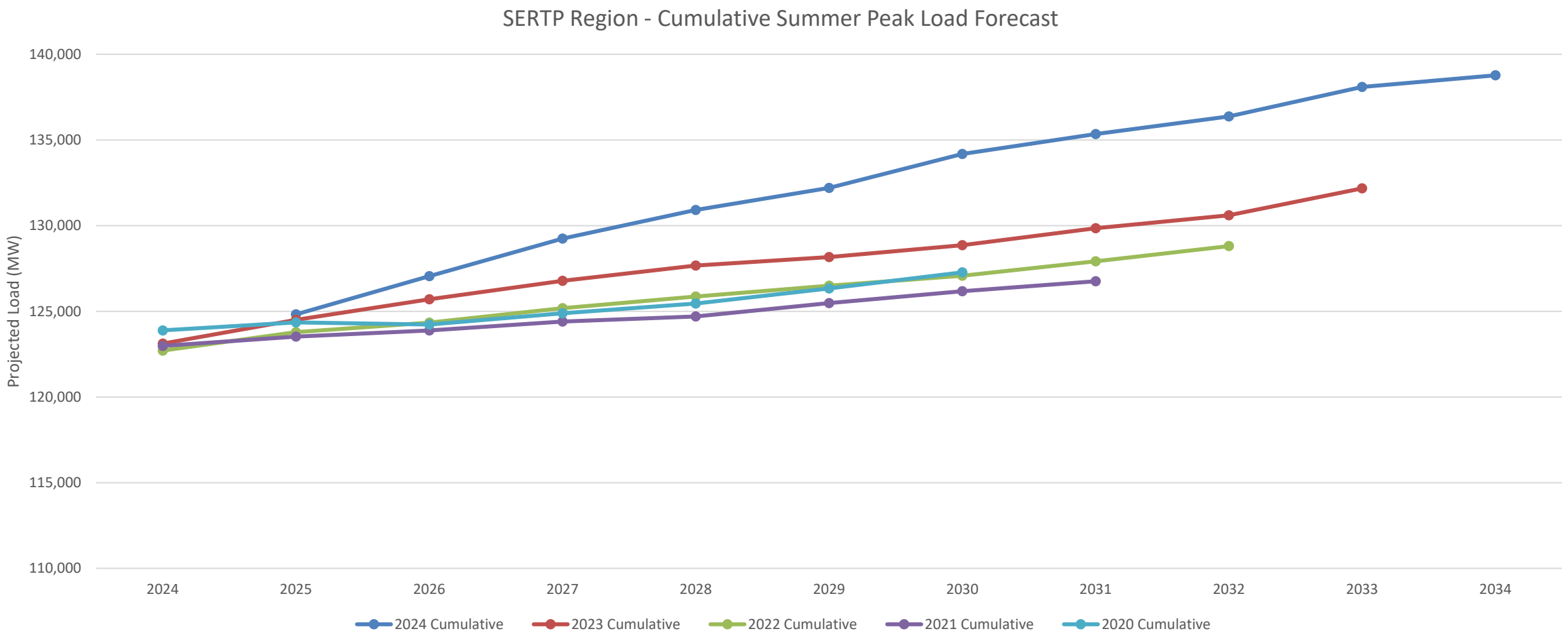
Southeastern Regional Transmission Planning (SERTP)



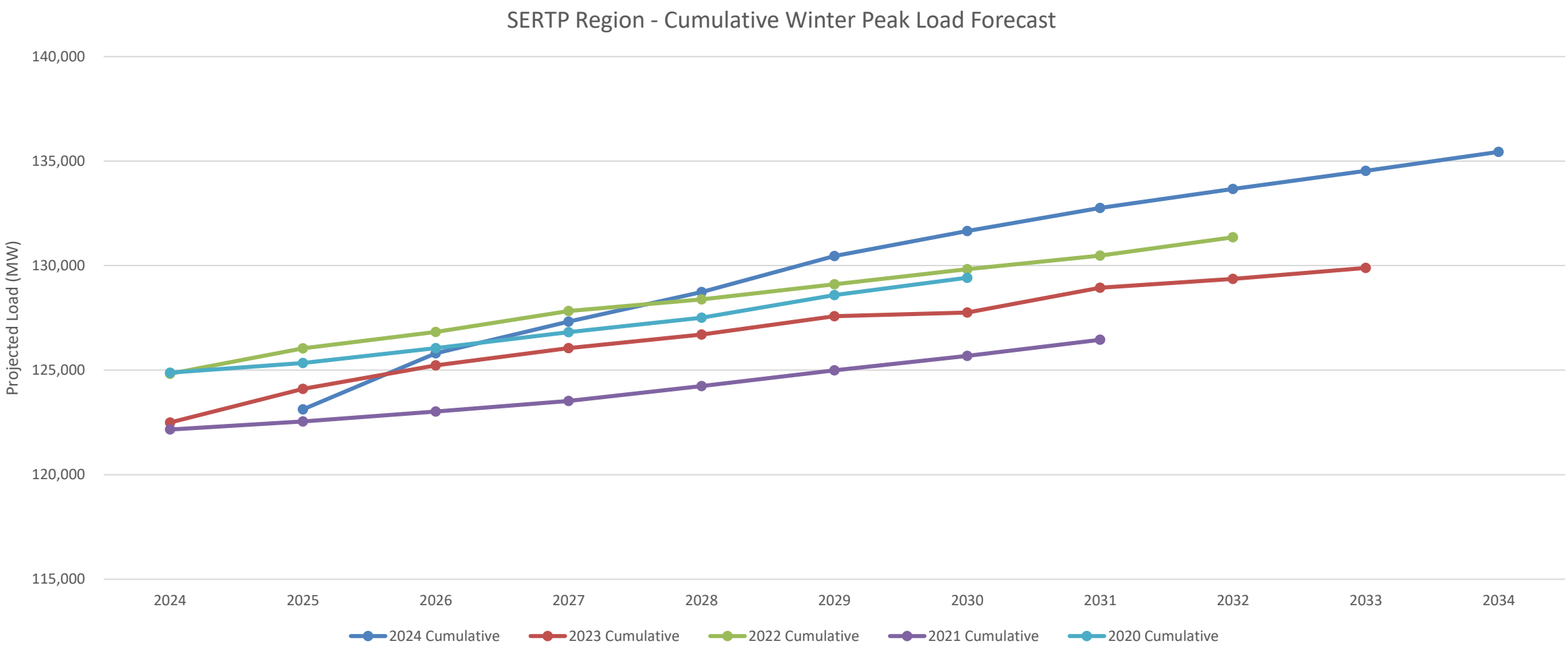
SERTP

- Associated Electric Cooperative Inc.
- Dalton Utilities
- Duke Energy
- Georgia Transmission
- LG&E KU
- MEAG Power
- PowerSouth Energy Cooperative
- Southern Company
- TVA

SERTP Cumulative Summer Peak Load Forecast



SERTP Cumulative Winter Peak Load Forecast



Criteria For Projects in Presentation

- **For the full list of projects, the 2024 Preliminary Expansion Plan Report is posted on the SERTP website**
  - Report
- **Criteria for projects near PJM interface included in today's presentation:**
  - New\Alternative\Grid Enhancing Technology
  - 161kV-300kV: Projects ~20miles or longer
  - 161kV and above: New stations
  - 300kV and above: All projects
  - Tie lines: all projects

DEC Balancing Authority Area

DUKE ENERGY CAROLINAS Balancing Authority Area

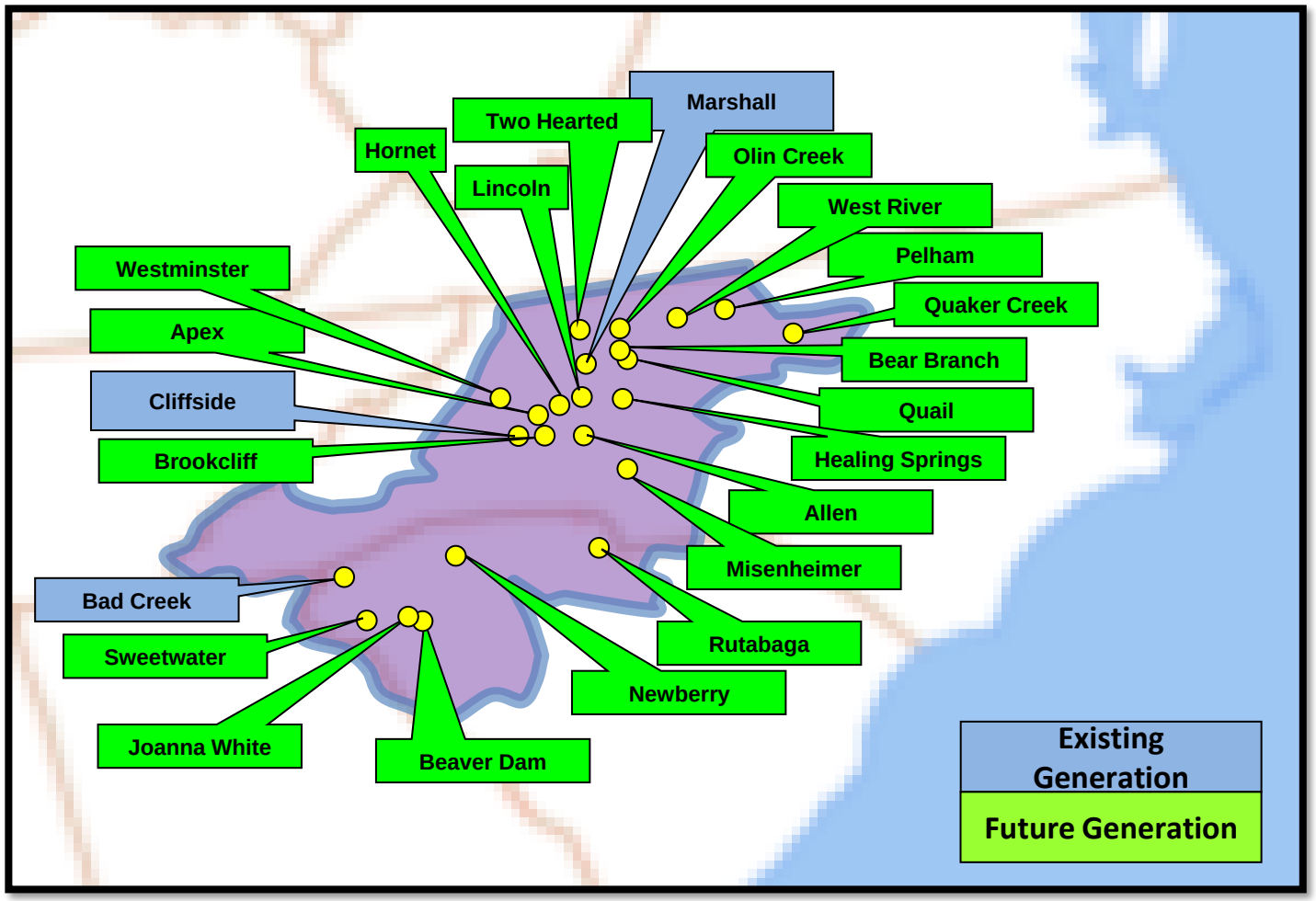
2024 Generation Assumptions

Southeastern Regional TRANSMISSION PLANNING

DEC Balancing Authority Area

DUKE ENERGY CAROLINAS – Generation Assumptions

The following diagram depicts the location of generation assumptions that change throughout the ten year planning horizon for the 2024 SERTP Process.



DEC Balancing Authority Area

DEC – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2024 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Allen 1	Coal	167	0	--	--	--	--	--	--	--	--	--
Allen 1 Proxy[1]	Proxy Generation	--	--	--	--	167	167	167	167	167	167	167
Allen 5	Coal	259	0	--	--	--	--	--	--	--	--	--
Cliffside 5	COAL	574	574	574	574	574	574	574	0	--	--	--
Cliffside 5 Proxy[1]	Proxy Generation	--	--	--	--	--	--	--	574	574	574	574
Lincoln 17	Natural Gas	--	402	402	402	402	402	402	402	402	402	402
Marshall 1	COAL	388	388	388	388	388	0	--	--	--	--	--
Marshall 1 Replacement	Natural Gas	--	--	--	--	--	388	388	388	388	388	388
Marshall 2	COAL	392	392	392	392	392	0	--	--	--	--	--
Marshall 2 Replacement	Natural Gas	--	--	--	--	--	392	392	392	392	392	392
Marshall 3	Coal	705	705	705	705	705	705	705	705	0	--	--
Marshall 4	Coal	711	711	711	711	711	711	711	711	0	--	--
Allen	Storage	--	--	50	50	50	50	50	50	50	50	50
Apex	Solar	--	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9

1. Generators left in model in expectation of replacement generation through the Generation Replacement Request process.

DEC Balancing Authority Area

DEC – Generation Assumptions Continued

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2024 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Bad Creek 4	Pumped Storage	420	420	420	420	420	420	420	420	420	420	420
Bear Branch	Solar	--	--	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Beaverdam	Solar	--	--	42	42	42	42	42	42	42	42	42
Brookcliff	Solar	--	50	50	50	50	50	50	50	50	50	50
Healing Springs	Solar	--	--	--	55	55	55	55	55	55	55	55
Hornet	Solar	--	--	73	73	73	73	73	73	73	73	73
Joanna White	Solar	--	--	--	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5
Misenheimer	Solar	74.4	74.4	74.4	74.4	74.4	74.4	74.4	74.4	74.4	74.4	74.4
Newberry	Solar	--	--	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5
Olin Creek	Solar	--	35	35	35	35	35	35	35	35	35	35
Pelham	Solar	32	32	32	32	32	32	32	32	32	32	32
Quail	Solar	--	--	30	30	30	30	30	30	30	30	30
Quaker Creek	Solar	--	--	35	35	35	35	35	35	35	35	35
Rutabaga	Solar	--	--	--	--	69.75	69.75	69.75	69.75	69.75	69.75	69.75
Sweetwater	Solar	--	--	--	34	34	34	34	34	34	34	34
Two Hearted	Solar	--	22	22	22	22	22	22	22	22	22	22
West River	Solar	--	--	40	40	40	40	40	40	40	40	40
Westminster	Solar	--	--	70	70	70	70	70	70	70	70	70

Southeastern Regional TRANSMISSION PLANNING

DEC Balancing Authority Area

DUKE ENERGY CAROLINAS – Generation Assumptions (Point-to-Point)

The following table depicts generation assumptions based upon expected long-term firm point-to-point commitments for the SERTP 2024 Planning Process. The years shown represent Summer Peak conditions.

SITE	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Cleveland	195	195	195	195	196	196	196	196	196	196
Broad River	925	925	925	925	925	925	925	925	925	925
Catawba	407	407	407	407	407	407	407	407	407	407
Rowan	441	428	373	376	370	180	180	180	180	180
Kings Mountain	92	92	92	92	92	92	92	92	92	92

DEC Balancing Authority Area

DUKE ENERGY CAROLINAS Balancing Authority Area

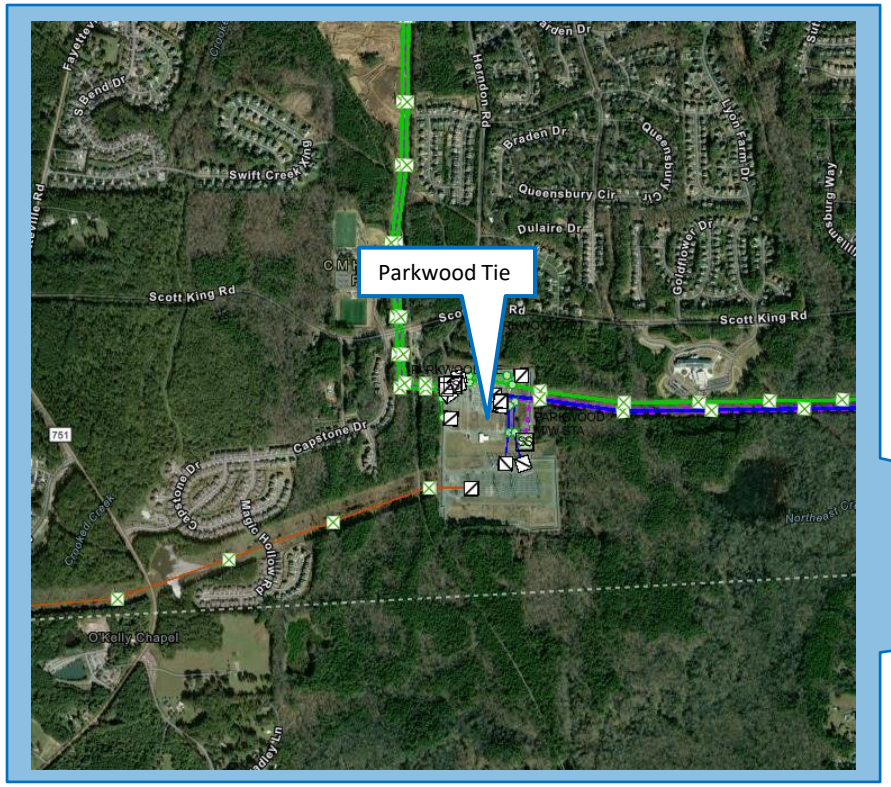
Preliminary Transmission Expansion Plan

DEC Balancing Authority Area

DUKE ENERGY CAROLINAS – 1

- **2024**

PARKWOOD TIE

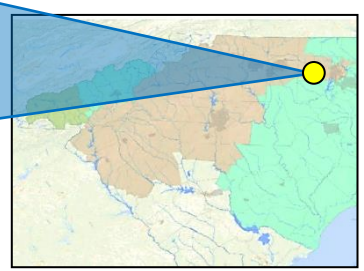


DESCRIPTION:

- Replace the existing 3 - 500/230 kV single phase autobanks of bank 5 with new 1680 MVA single phase banks

SUPPORTING STATEMENT:

- The existing bank experienced a failure



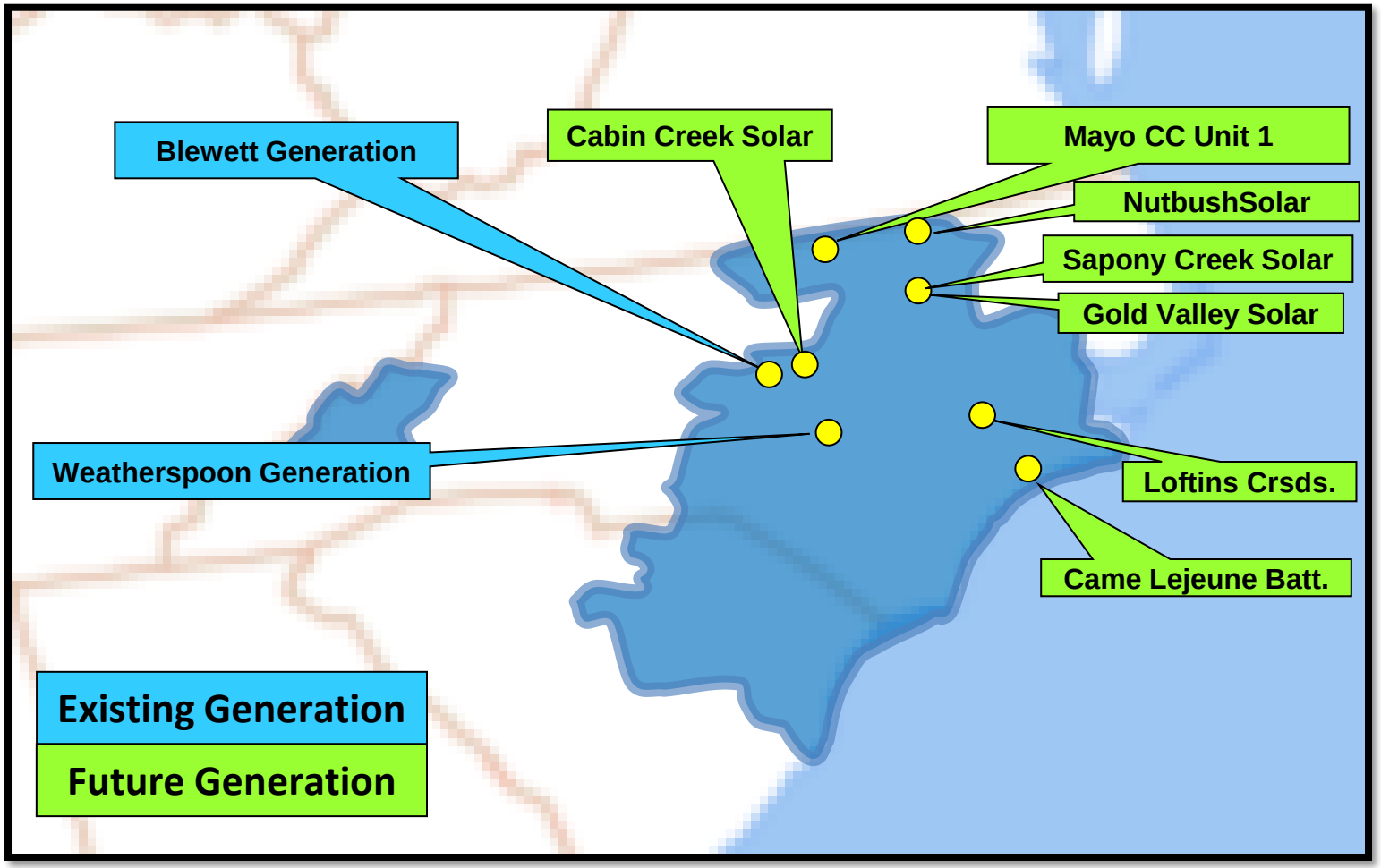
DUKE ENERGY PROGRESS EAST/WEST

Balancing Authority Areas

Generation Assumptions

DUKE ENERGY PROGRESS – Generation Assumptions

The following diagram depicts the location of generation assumptions <u>that change</u> throughout the ten year planning horizon for the 2024 SERTP Process.



DUKE ENERGY PROGRESS – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2024 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
BLEWETT IC #1	OIL	0	--	--	--	--	--	--	--	--	--	--
BLEWETT IC #2	OIL	0	--	--	--	--	--	--	--	--	--	--
BLEWETT IC #3	OIL	0	--	--	--	--	--	--	--	--	--	--
BLEWETT IC #4	OIL	0	--	--	--	--	--	--	--	--	--	--
WEATHERSPOON IC #1	GAS/OIL	0	--	--	--	--	--	--	--	--	--	--
WEATHERSPOON IC #2	GAS/OIL	0	--	--	--	--	--	--	--	--	--	--
WEATHERSPOON IC #3	GAS/OIL	0	--	--	--	--	--	--	--	--	--	--
WEATHERSPOON IC #4	GAS/OIL	0	--	--	--	--	--	--	--	--	--	--

DUKE ENERGY PROGRESS – Generation Assumptions (Cont.)

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2024 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
CABIN CREEK SOLAR	PV	70.2	70.2	70.2	70.2	70.2	70.2	70.2	70.2	70.2	70.2	70.2
GOLD VALLEY SOLAR	PV	78.8	78.8	78.8	78.8	78.8	78.8	78.8	78.8	78.8	78.8	78.8
NUTBUSH SOLAR	PV	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
CAMP LEJEUNE BATT.	BATTERY	11	11	11	11	11	11	11	11	11	11	11
SAPONY CREEK SOLAR	PV	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
LOFTINS CROSSROADS	PV	75	75	75	75	75	75	75	75	75	75	75
MAYO CC UNIT 1*	CC	--	--	--	--	--	--	--	--	450	450	450

***Mayo CC Unit 1 is a fictitious unit used to balance case generation and load in late-year studies.**

DUKE ENERGY PROGRESS – Generation Assumptions (Point-to-Point)

The following table depicts generation assumptions based upon expected long-term firm point-to-point commitments. The years shown represent Summer Peak conditions.

SITE	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
HAMLET #1 AND #2	110	110	110	110	110	110	110	110	110	110	110
HAMLET #6	55	55	55	55	55	55	55	55	55	55	55
HAMLET #3	0	4	6	9	9	11	13	14	0	0	0

DUKE ENERGY PROGRESS EAST

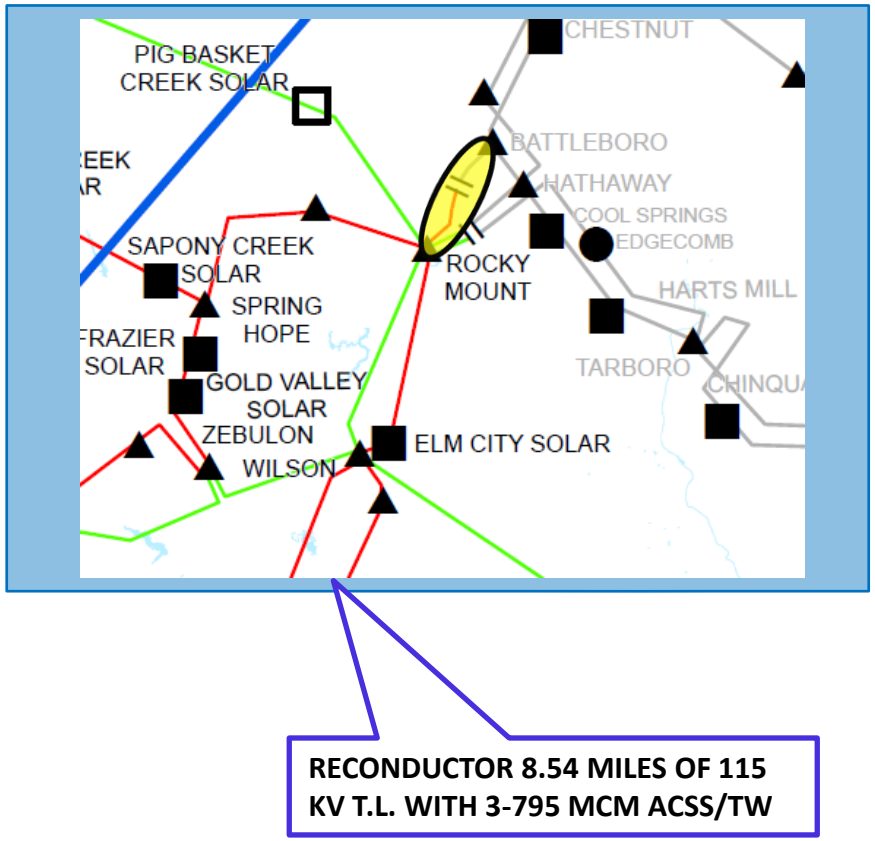
Balancing Authority Area

Regional Transmission Expansion Plan

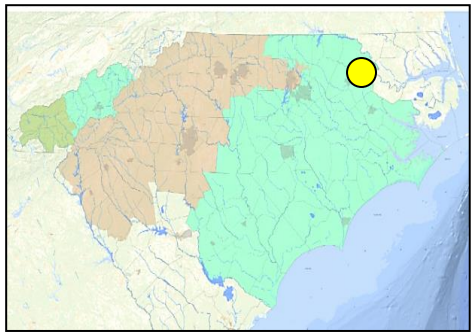
DUKE ENERGY PROGRESS EAST – 1

- **2025**

Rocky Mount – V.P. Battleboro 115 kV line, Reconductor



- **DESCRIPTION:**
  - Reconductor the entire Rocky Mount – Vepco (Dominion) Battleboro 115 kV line, 8.54 miles, with 3-795 MCM ACSS/TW conductor. This conductor qualifies the project as a GET
- **SUPPORTING STATEMENT:**
  - With generation in the PJM queue, the NERC P7 outage of both Rocky Mount – Hathaway 230 kV lines overloads the Rocky Mount – Vepco (Dominion) Battleboro 115 kV line.



LG&E/KU Balancing Authority Area

2024 Generation Assumptions

LG&E/KU – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten-year planning horizon for the 2024 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
GI-2021-007	Solar	0	120	120	120	120	120	120	120	120	120

LG&E/KU Balancing Authority Area

LG&E/KU – Generation Assumptions (Point-to-Point)

The following table depicts generation assumptions based upon expected long-term firm point-to-point commitments. The years shown represent Summer Peak conditions.

SITE	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
TRIMBLE COUNTY	324	324	324	324	324	324	324	324	324	324

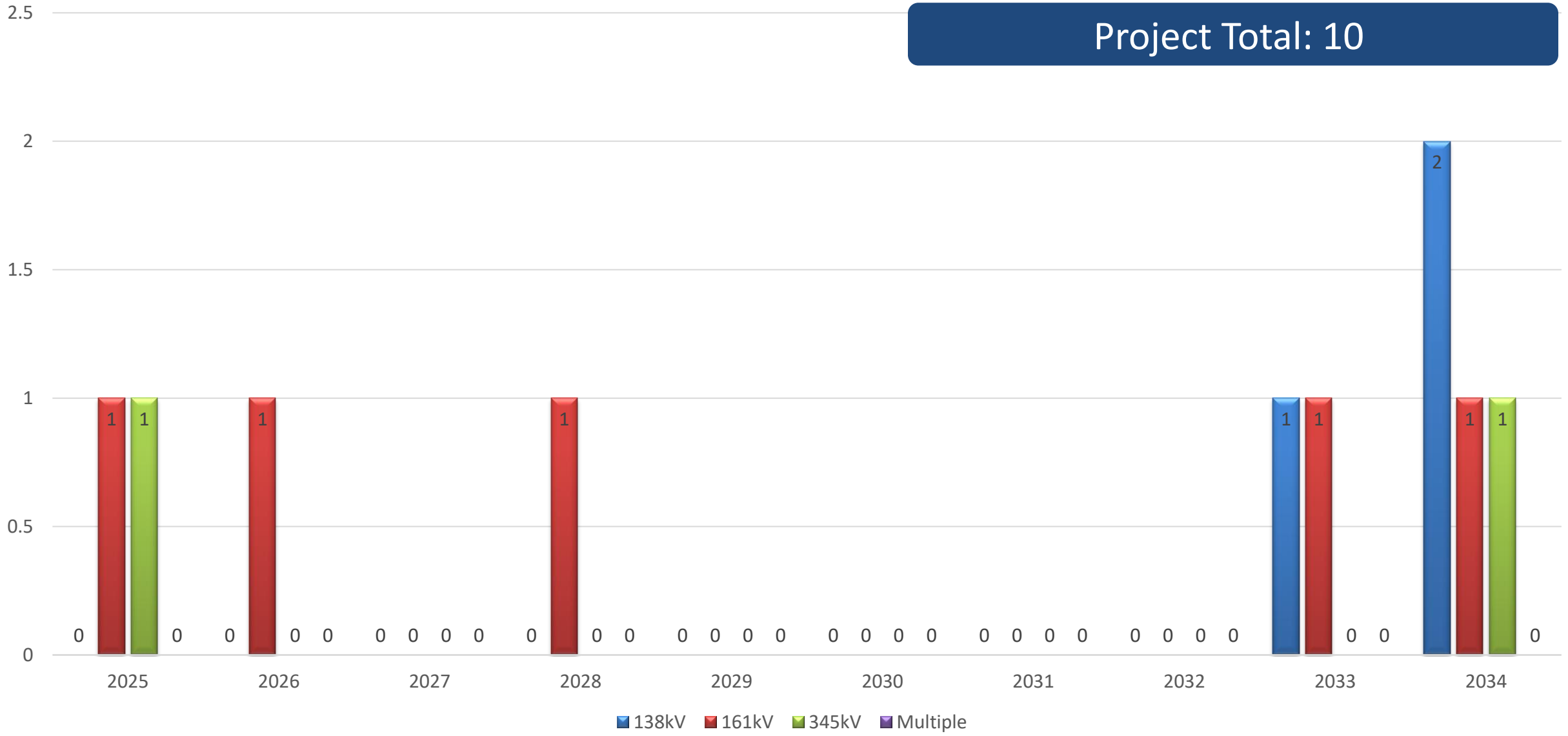
LG&E/KU Balancing Authority Area

Preliminary Transmission Expansion Plan

Southeastern Regional
TRANSMISSION PLANNI

LG&E/KU Project Summary

Project Total: 10

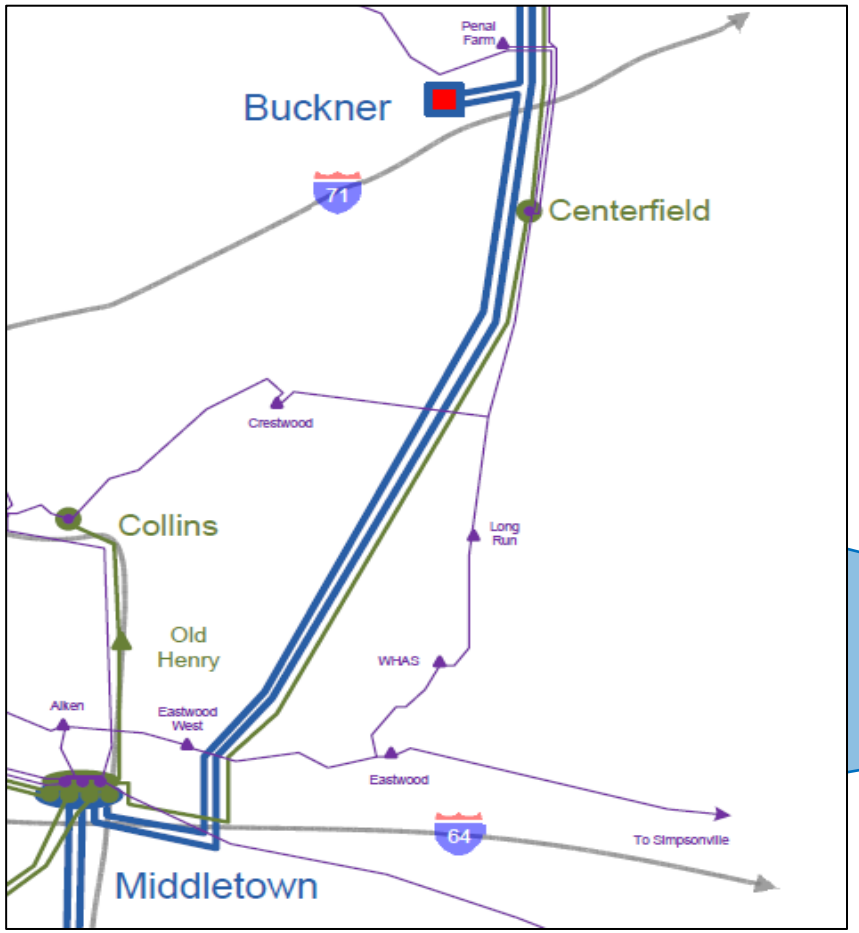


LG&E/KU Balancing Authority Area

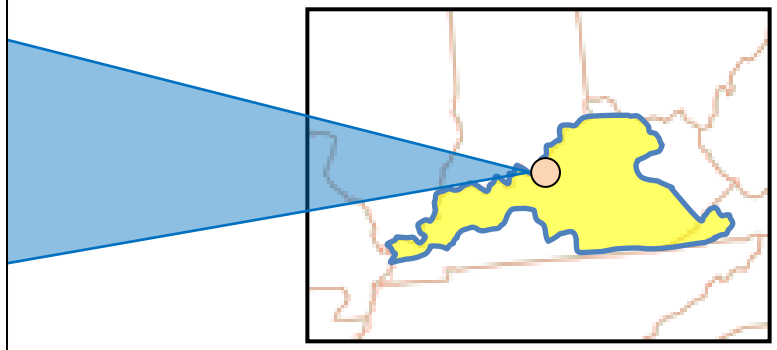
LG&E/KU - 1

- **2025**

MIDDLETOWN – BUCKNER 345 KV



- **DESCRIPTION:**
  - Replace the 345kV 2000A breakers associated with the Middletown – Buckner 345kV line with 3000A breakers.
- **SUPPORTING STATEMENT:**
  - The Middletown – Buckner 345 kV transmission line overloads under contingency.

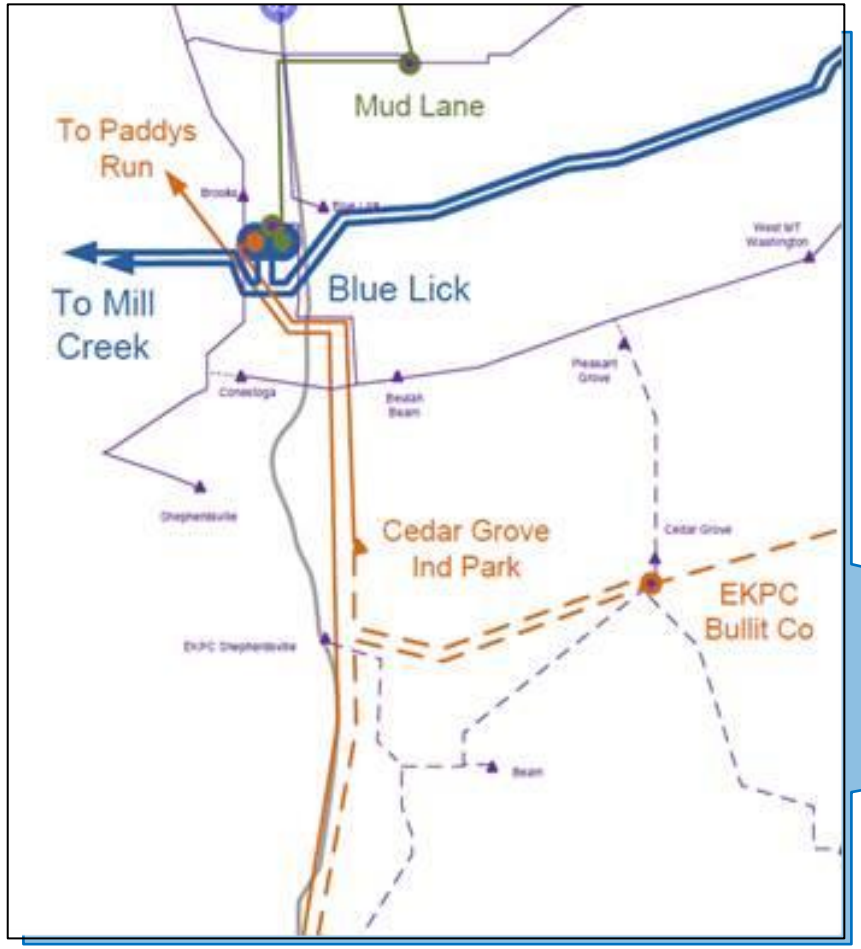


LG&E/KU Balancing Authority Area

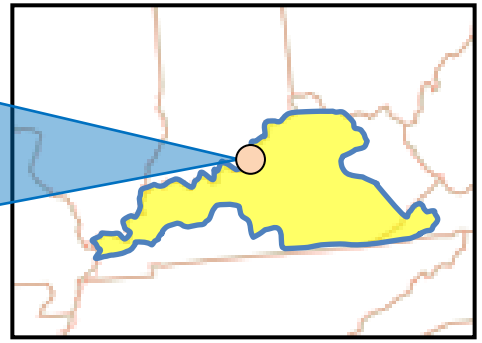
LG&E/KU - 2

- **2028**

BULLITT CO – CEDAR GROVE 161 KV



- **DESCRIPTION:**
  - Reconductor approximately 1.6 miles of the Bullitt Co - Cedar Grove 161 kV transmission line with 795 ACSR or better.
- **SUPPORTING STATEMENT:**
  - The Bullitt Co – Cedar Grove 161 KV transmission line overloads under contingency.



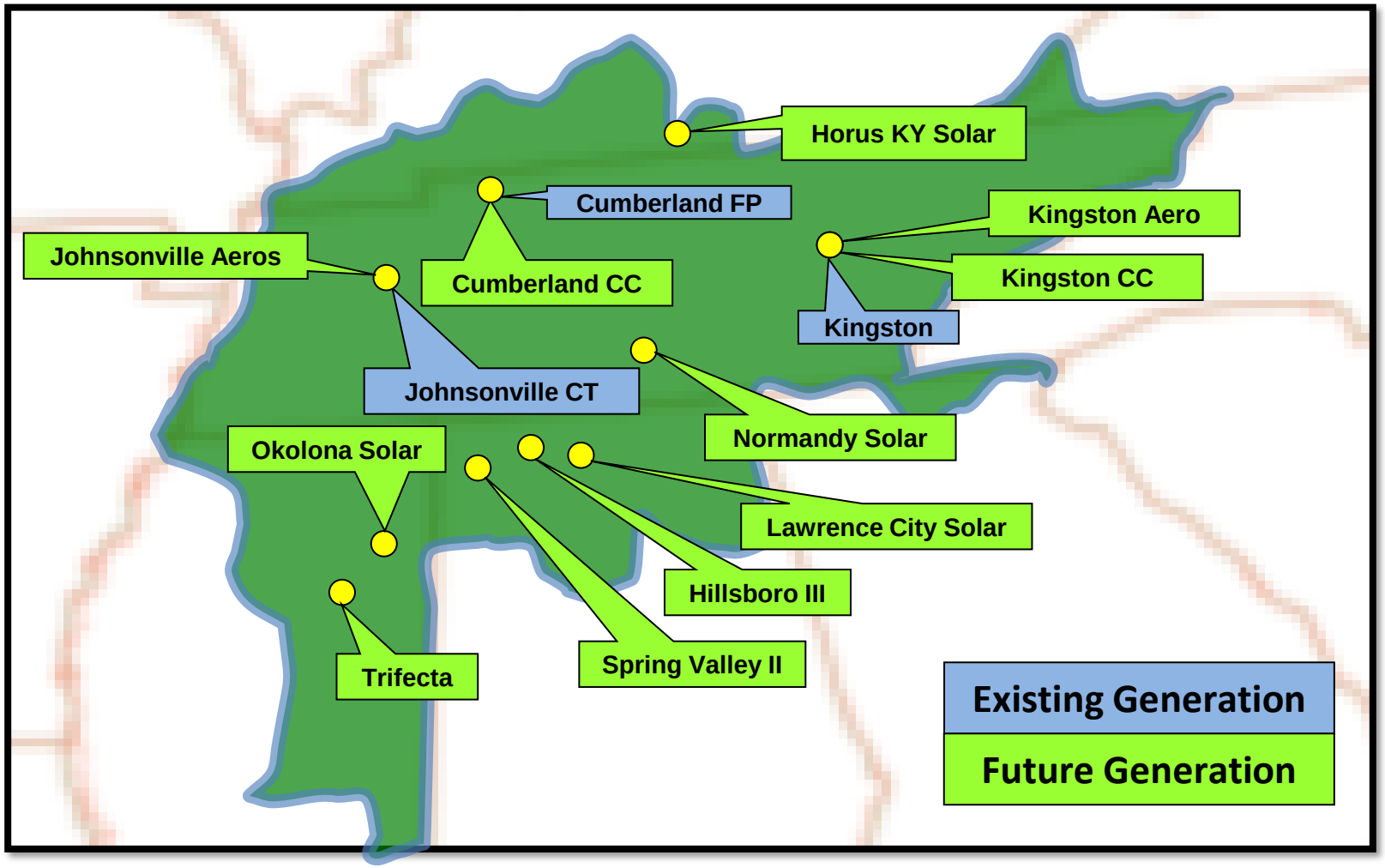
TVA Balancing Authority Area

2024 Generation Assumptions

TVA Balancing Authority Area

TVA – Generation Assumptions

The following diagram depicts the location of generation assumptions <u>that change</u> throughout the ten year planning horizon for the 2024 SERTP Process.



TVA Balancing Authority Area

TVA – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2024 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
JOHNSONVILLE CT	GAS	0	--	--	--	--	--	--	--	--	--
CUMBERLAND FP UNIT 2	COAL	1130	1130	0	--	--	--	--	--	--	--
CUMBERLAND FP UNIT 1	COAL	1130	1130	1130	1130	0	--	--	--	--	--
KINGSTON FP	COAL	1157	1157	1157	0	--	--	--	--	--	--
JOHNSONVILLE AEROS	GAS	530	530	530	530	530	530	530	530	530	530
CUMBERLAND CC	GAS	--	--	1346	1346	1346	1346	1346	1346	1346	1346
KINGSTON CC	GAS	--	--	--	715	715	715	715	715	715	715
KINGSTON AERO	GAS	--	--	--	848	848	848	848	848	848	848

TVA Balancing Authority Area

TVA – Generation Assumptions

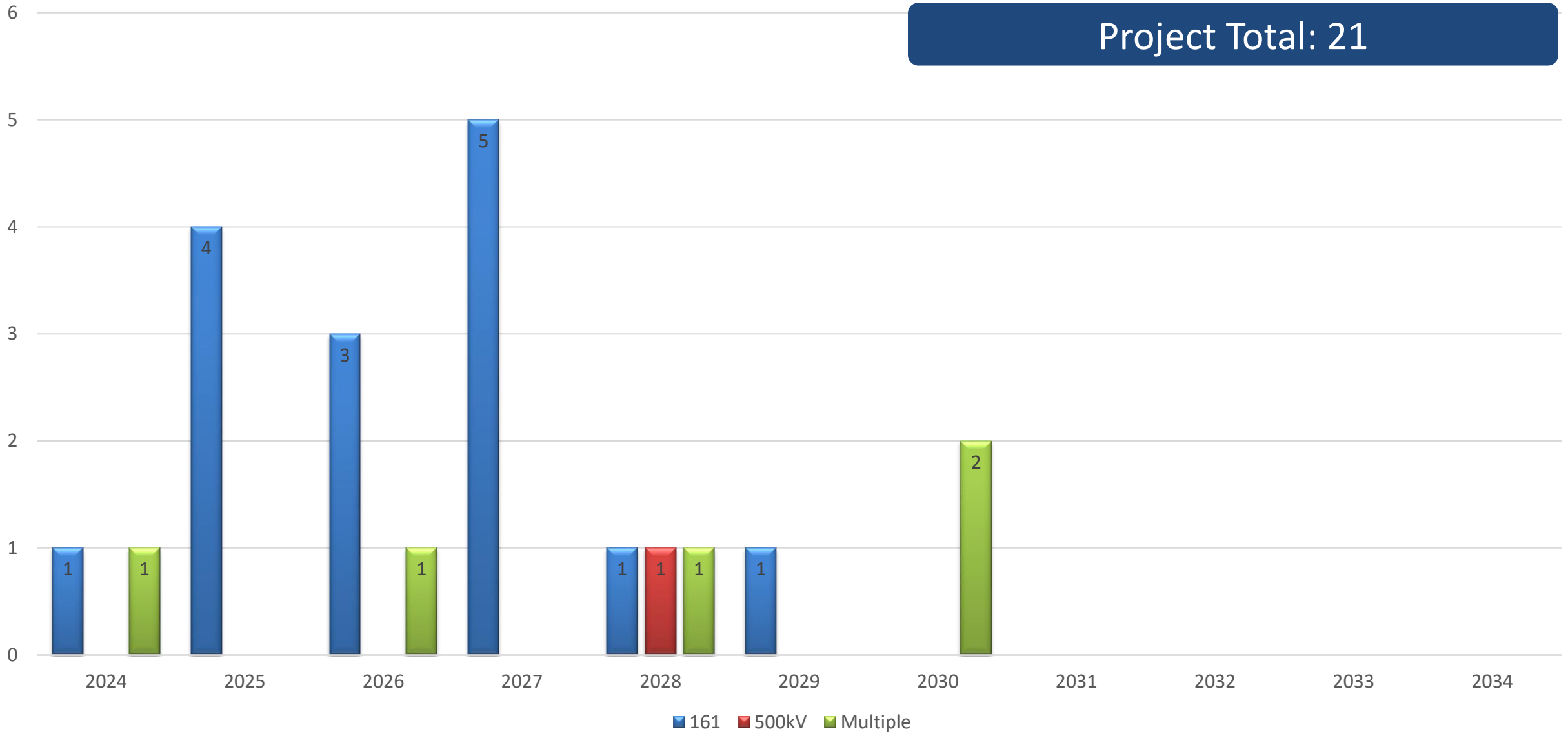
The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2024 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
TRIFECTA	SOLAR	--	--	68	68	68	68	68	68	68	68
HILLSBORO III	SOLAR	--	--	200	200	200	200	200	200	200	200
SPRING VALLEY II	SOLAR	--	--	200	200	200	200	200	200	200	200
LAWRENCE CITY	SOLAR	--	100	100	100	100	100	100	100	100	100
OKOLONA	SOLAR	--	--	145	145	145	145	145	145	145	145
NORMANDY	SOLAR	--	213	213	213	213	213	213	213	213	213
HORUS KY	SOLAR	--	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3

Southeastern Regional
TRANSMISSION PLANNI

TVA Project Summary

Project Total: 21



TVA Balancing Authority Area

TVA Balancing Authority Area

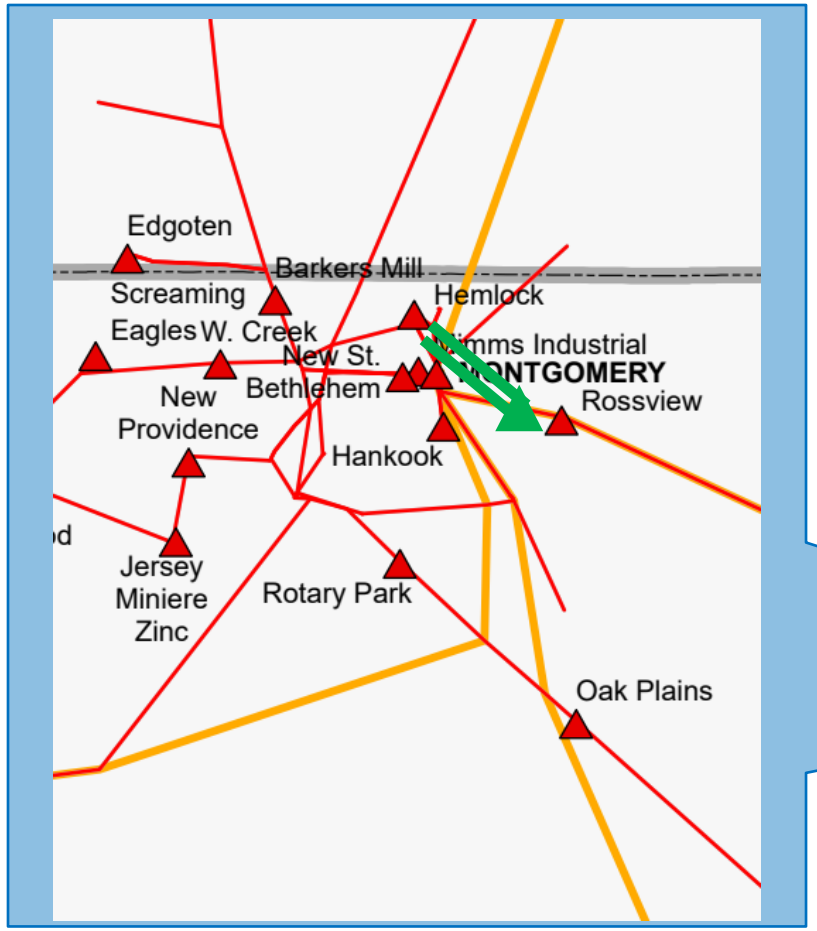
Preliminary Transmission Expansion Plan

TVA Balancing Authority Area

TVA – 1

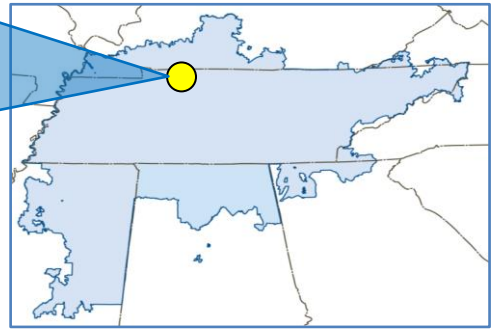
• **2030**

HAMPTON 500 KV STATION



- **DESCRIPTION:**
  - Construct new 500/161 kV station. Loop in existing Montgomery-Wilson 500kV line (approximately 0.1 mile from station to loop point). Loop in existing double circuit 161kV from Montgomery to Hemlock.

- **SUPPORTING STATEMENT:**
  - Additional thermal capacity and voltage support is needed in the Montgomery County, TN & Todd County, KY area under contingency.

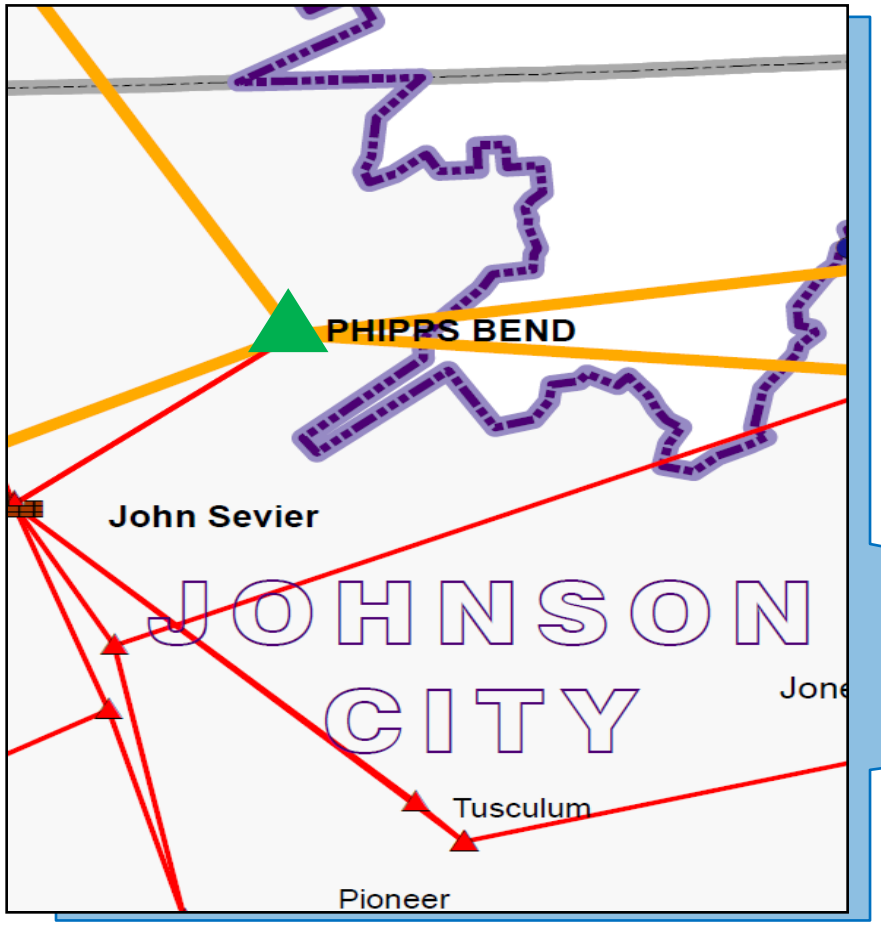


TVA Balancing Authority Area

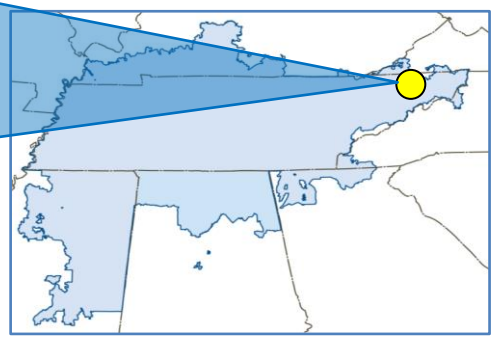
TVA – 2

• **2024**

PHIPPS BEND 500 KV SUBSTATION



- **DESCRIPTION:**
  - Rebuild structures with weathered steel in the Phipps Bend 500 and 161 kV yard.
- **SUPPORTING STATEMENT:**
  - Steel structures in the Phipps Bend 500 kV and 161 kV yards are beginning to show signs of corrosion and will be replaced.

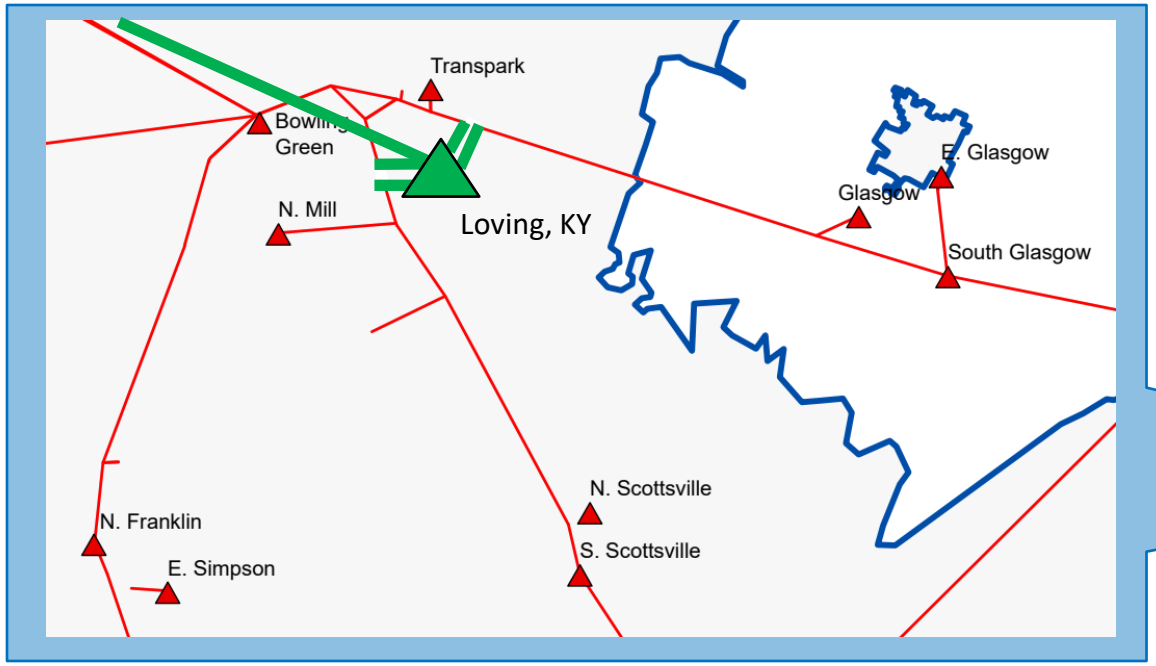


TVA Balancing Authority Area

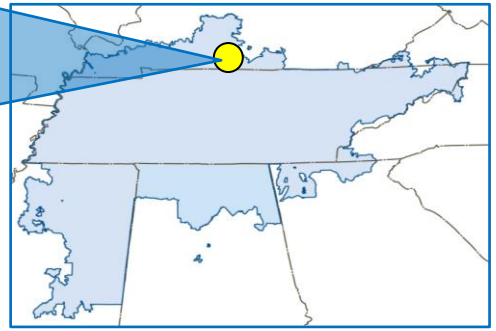
TVA – 3

- **2028**

LOVING, KY 161KV STATION



- **DESCRIPTION:**
  - Construct the Loving, KY 161kV Substation. Reconductor approximately 26.71 miles of transmission line from Bowling Green to Lost City with 1351 ACSS at 140°C. Reconductor approximately 8.64 miles of transmission line from Bowling Green to East Bowling Green with 1351 ACSS at 135°C.
- **SUPPORTING STATEMENT:**
  - Additional capacity is needed in the Bowling Green area for economic development.

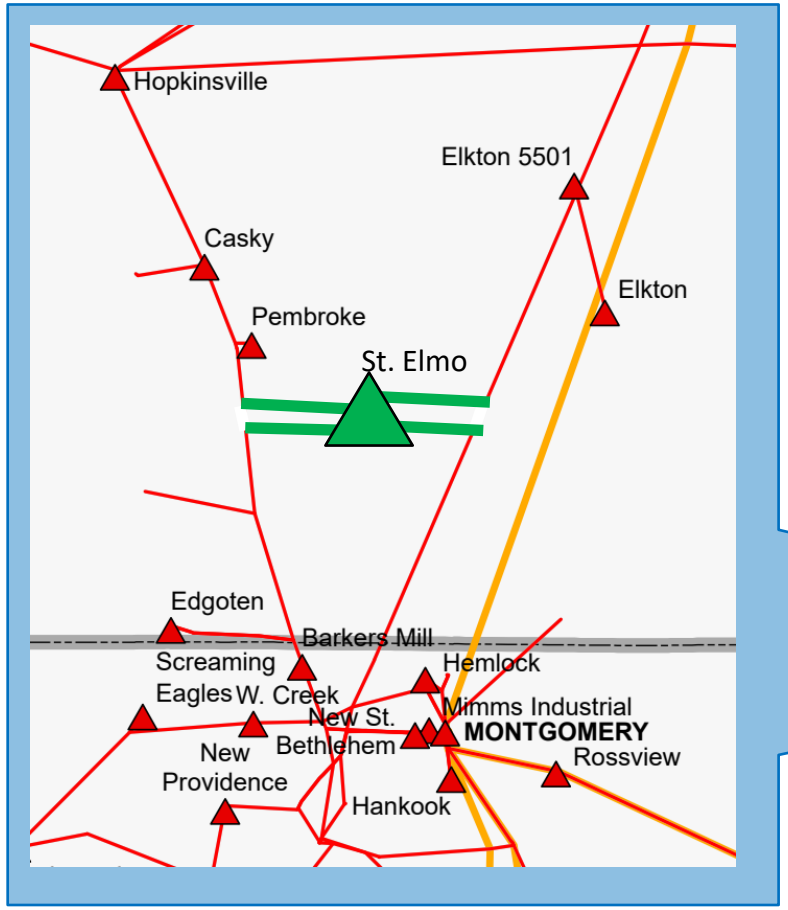


TVA Balancing Authority Area

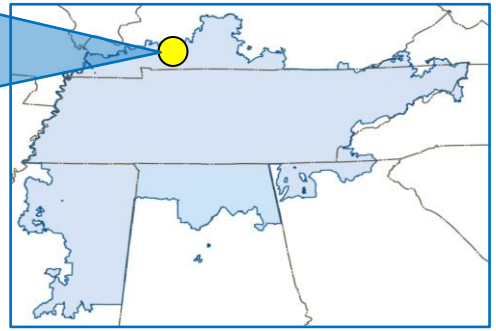
TVA – 4

• **2028**

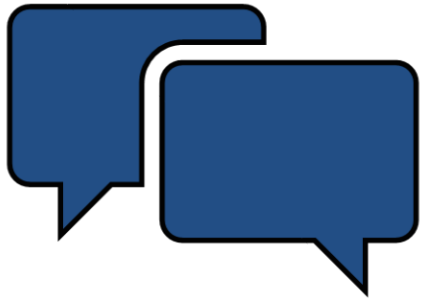
ST. ELMO, KY 161 KY SUBSTATION



- **DESCRIPTION:**
  - Construct new 161kV substation. Loop in Edgoten-Casky 161kV transmission line (approximately 0.6 miles from station to loop point). Loop in Paradise-Clarksville 161kV transmission line (approximately 10 miles from station to loop point).
- **SUPPORTING STATEMENT:**
  - Voltage support and additional capacity is needed for economic development in the Bowling Green area.



2024 SERTP



Questions?

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