Southeastern Regional TRANSMISSION PLANNING

2022 SERTP

PJM–SERTP Regional Transmission Plan Review

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

September 23, 2022

Microsoft Teams

Southeastern Regional TRANSMISSION PLANNING

PJM – SERTP Interregional

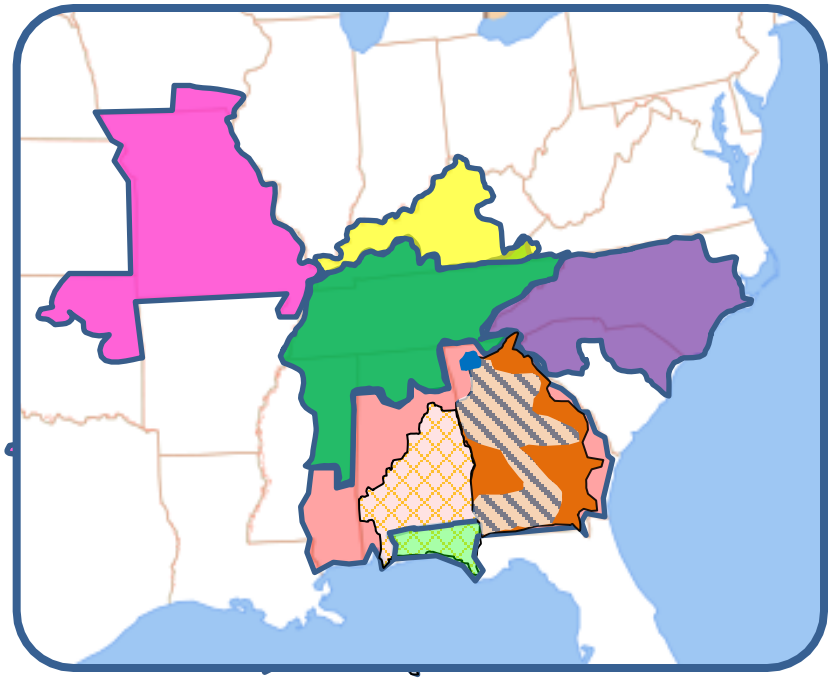
Agenda

- Final 2022 SERTP Regional Transmission Plan – PJM Seam
- SERTP Modeling Input Assumptions

Southeastern Regional TRANSMISSION PLANNING

PJM – SERTP Interregional

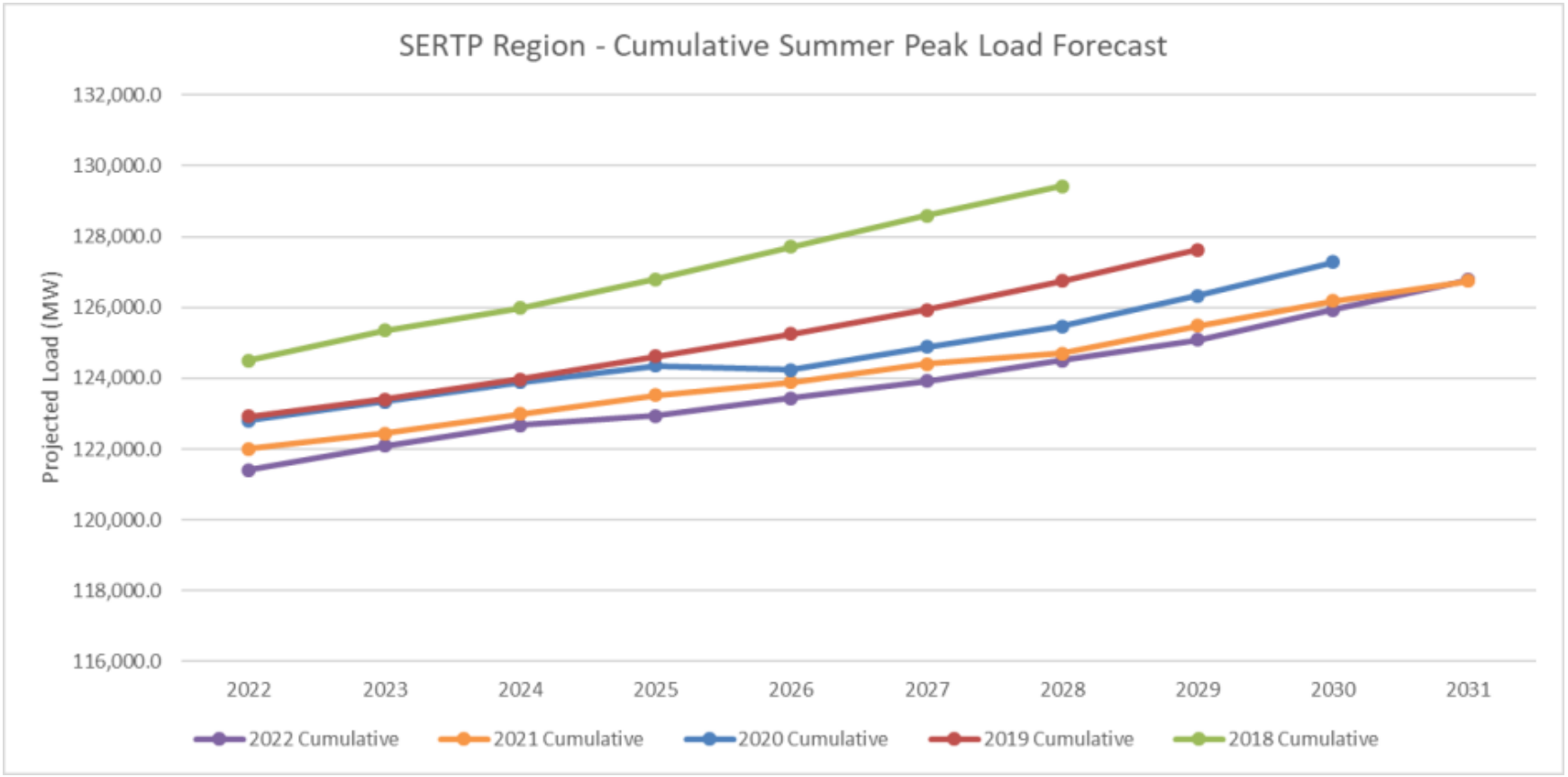
Southeastern Regional Transmission Planning (SERTP)



SERTP

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

SERTP Cumulative Summer Peak Load Forecast



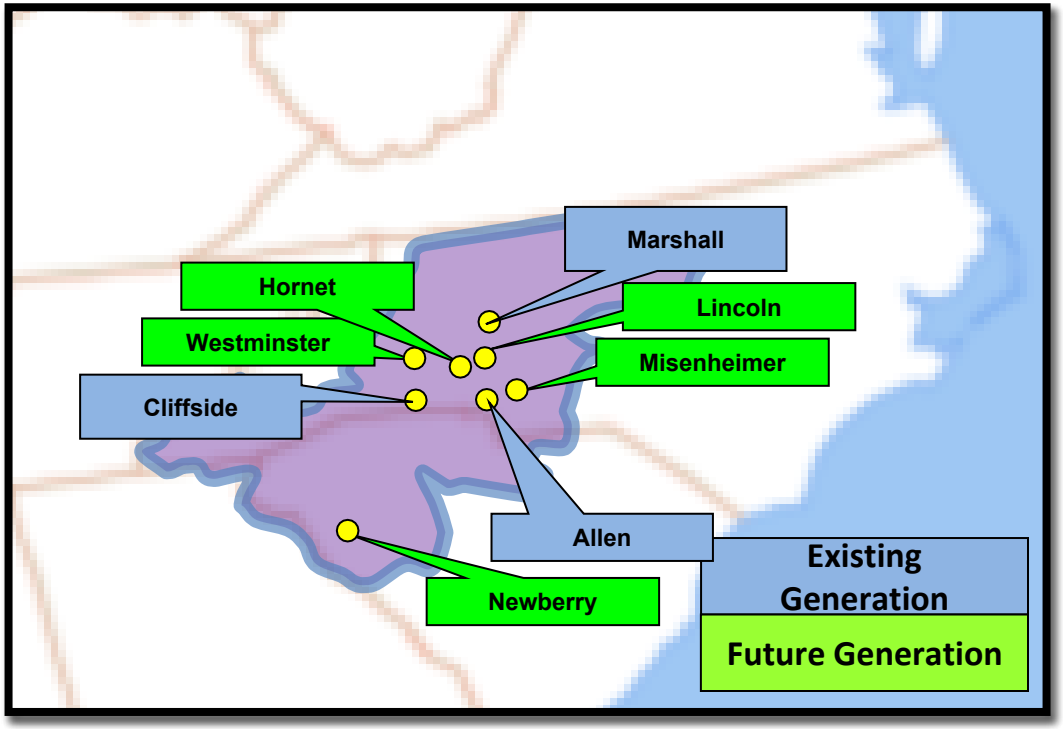
DUKE ENERGY CAROLINAS Balancing Authority Area

Generation Assumptions

Southeastern Regional
TRANSMISSION PLANNING

DUKE ENERGY CAROLINAS – Generation Assumptions

The following diagram depicts the location of generation assumptions <u>that change</u> throughout the ten year planning horizon for the 2022 SERTP Process.



Southeastern Regional
TRANSMISSION PLANNING

DUKE CAROLINAS – Generation Assumptions

The following table depicts the generation assumptions <u>that change</u> throughout the ten year planning horizon for the 2022 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Allen 1	COAL	158	0	--	--	--	--	--	--	--	--
Allen 5	COAL	253	0	--	--	--	--	--	--	--	--
Cliffside 5	COAL	574	574	574	0	--	--	--	--	--	--
Marshall 1	COAL	388	388	388	388	388	388	0	--	--	--
Marshall 2	COAL	392	392	392	392	392	392	0	--	--	--
Misenheimer	PV	74.4	74.4	74.4	74.4	74.4	74.4	74.4	74.4	74.4	74.4
Westminster	PV	75	75	75	75	75	75	75	75	75	75
Hornet	PV	--	74	74	74	74	74	74	74	74	74
Newberry	PV	--	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5
Lincoln 17	GAS	--	402	402	402	402	402	402	402	402	402

Southeastern Regional
TRANSMISSION PLANNING

DUKE ENERGY CAROLINAS – 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	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Cleveland	195	195	195	195	196	196	196	196	196	196
Broad River	875	875	875	875	875	875	875	875	875	875
Catawba	407	407	407	407	407	407	407	407	407	407
Rowan	460	441	428	373	376	370	180	180	180	180
Kings Mountain	32	92	92	92	92	92	92	92	92	92

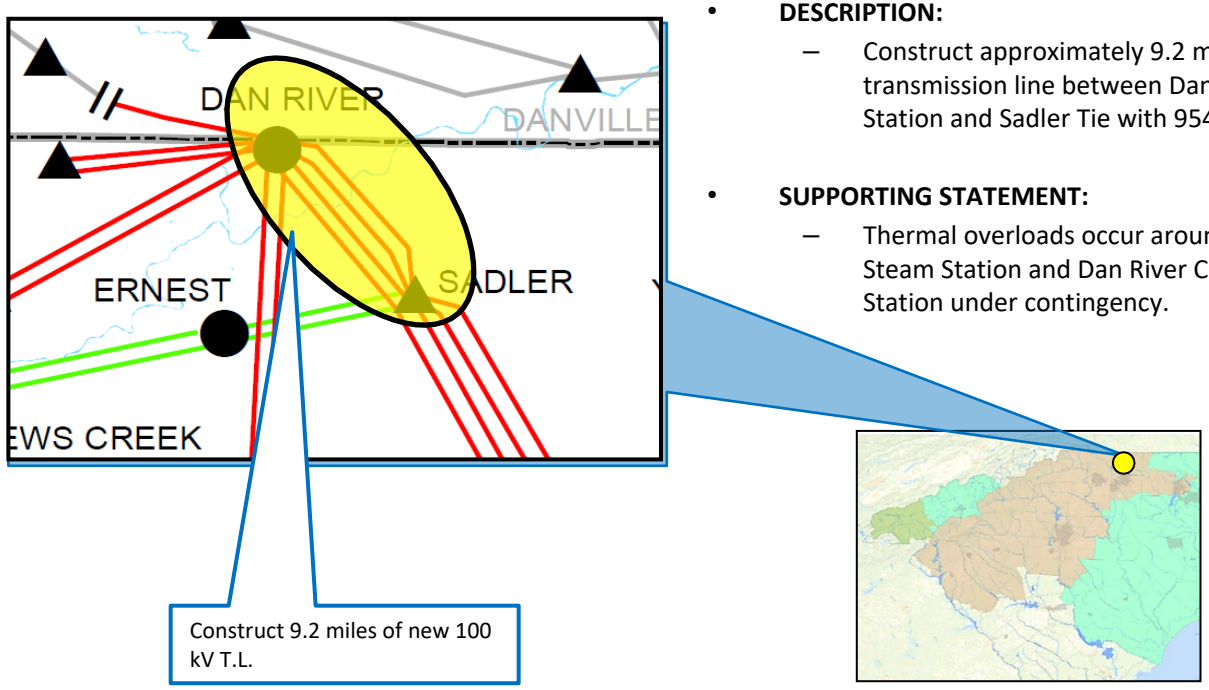
DUKE ENERGY CAROLINAS Balancing Authority Area

Preliminary Transmission Expansion Plan

DUKE ENERGY CAROLINAS - 1

SADLER TIE – DAN RIVER 100 KV TRANSMISSION LINE

- **2024**

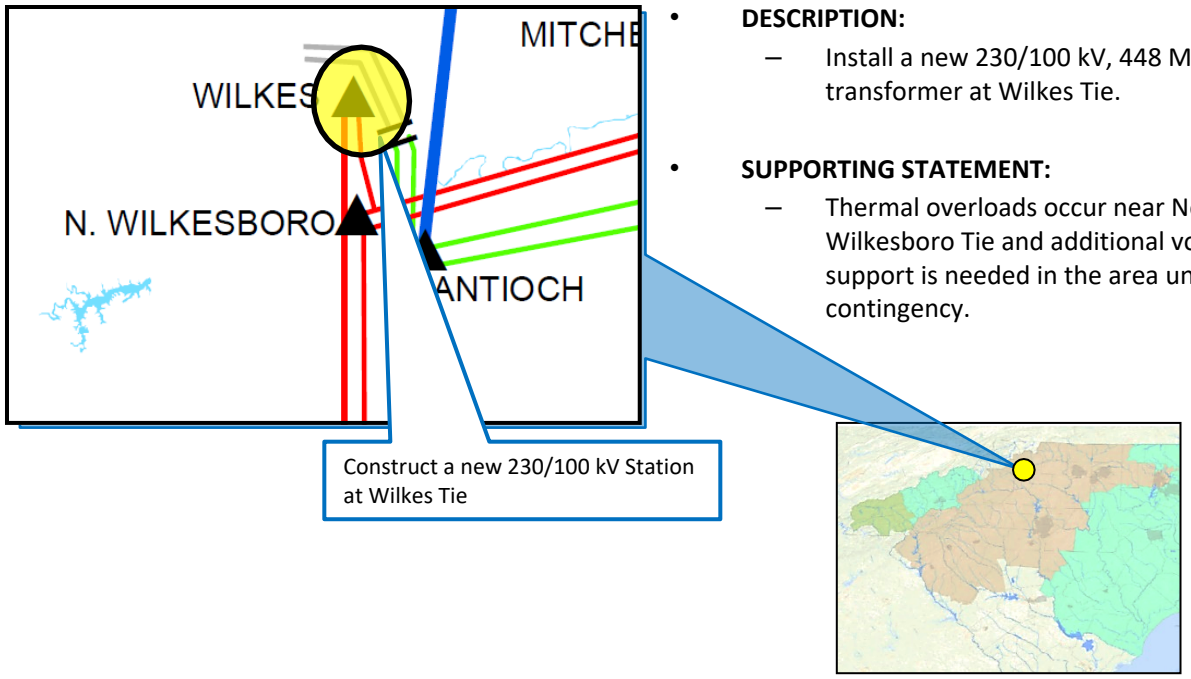


- **DESCRIPTION:**
  - Construct approximately 9.2 miles of new 100 kV transmission line between Dan River Steam Station and Sadler Tie with 954 AAC at 120°C.
- **SUPPORTING STATEMENT:**
  - Thermal overloads occur around Dan River Steam Station and Dan River Combined Cycle Station under contingency.

DUKE ENERGY CAROLINAS - 2

WILKES TIE 230 KV SUBSTATION

- **2024**



- **DESCRIPTION:**
  - Install a new 230/100 kV, 448 MVA transformer at Wilkes Tie.
- **SUPPORTING STATEMENT:**
  - Thermal overloads occur near North Wilkesboro Tie and additional voltage support is needed in the area under contingency.

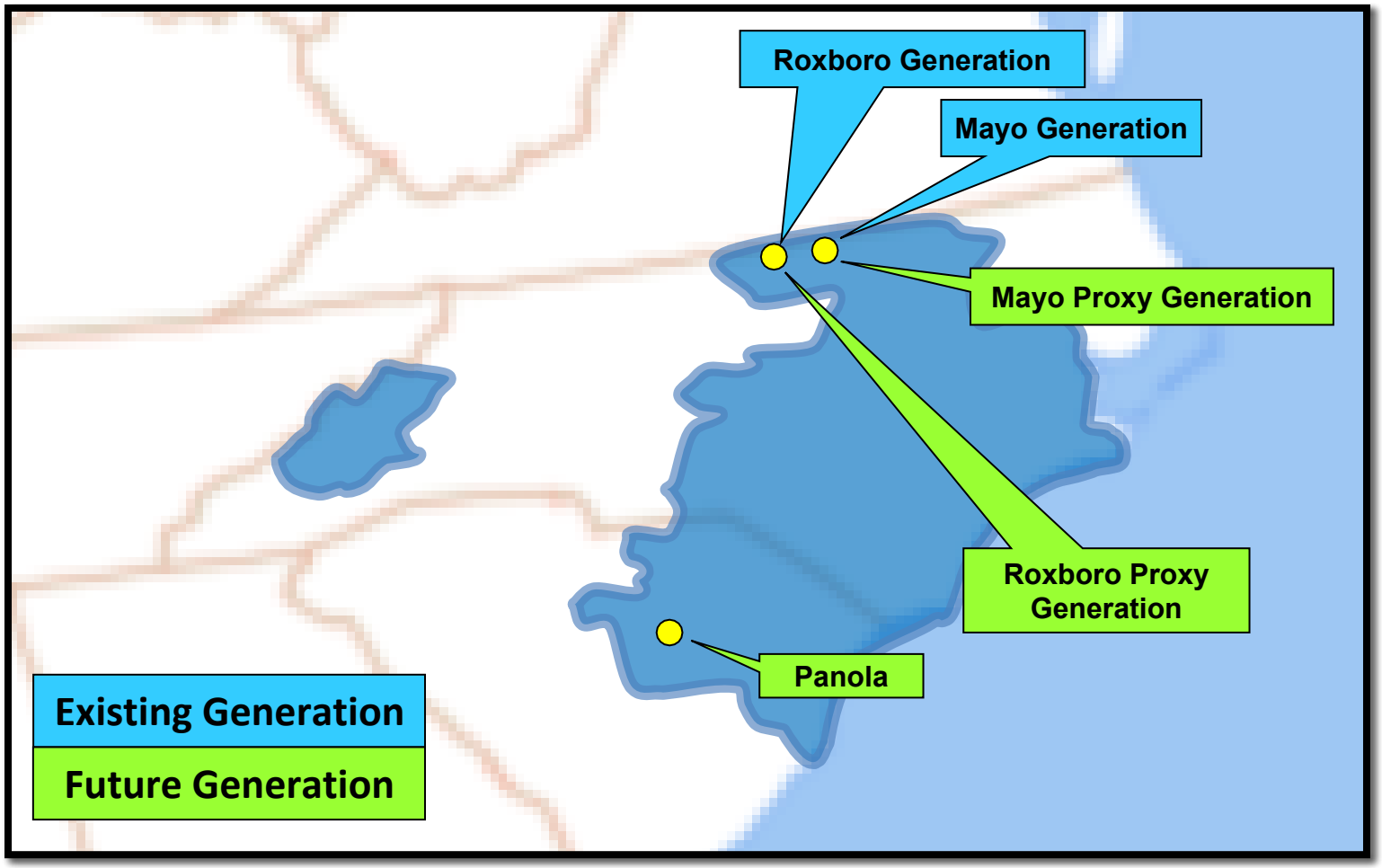
DUKE ENERGY PROGRESS EAST/WEST

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 2022 SERTP Process.



DUKE ENERGY PROGRESS – Generation Assumptions (Cont.)

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2022 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ROXBORO #1 COAL	COAL	379	379	379	379	379	379	0	--	--	--
ROXBORO #2 COAL	COAL	665	665	665	665	665	665	0	--	--	--
ROXBORO #3 COAL	COAL	691	691	691	691	691	0	--	--	--	--
ROXBORO #4 COAL	COAL	698	698	698	698	698	0	--	--	--	--
MAYO COAL	COAL	727	727	727	727	727	727	0	--	--	--
PANOLA PV	PV	67	67	67	67	67	67	67	67	67	67
ROXBORO PROXY #1	--	--	--	--	--	--	1350	1350	1350	1350	1350
ROXBORO PROXY #2	--	--	--	--	--	--	--	1350	1350	1350	1350
MAYO PROXY	--	--	--	--	--	--	--	602	602	602	602

LG&E/KU Balancing Authority Area

Generation Assumptions

Southeastern Regional
TRANSMISSION PLANNING

LG&E/KU – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2022 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Zorn	Gas	0	0	0	0	0	0	0	0	0	0
Ashwood	Solar	0	86	86	86	86	86	86	86	86	86
Rhudes Creek	Solar	100	100	100	100	100	100	100	100	100	100

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	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
TRIMBLE COUNTY	324	324	324	324	324	324	324	324	324	324

LG&E/KU Balancing Authority Area

Preliminary Transmission Expansion Plan

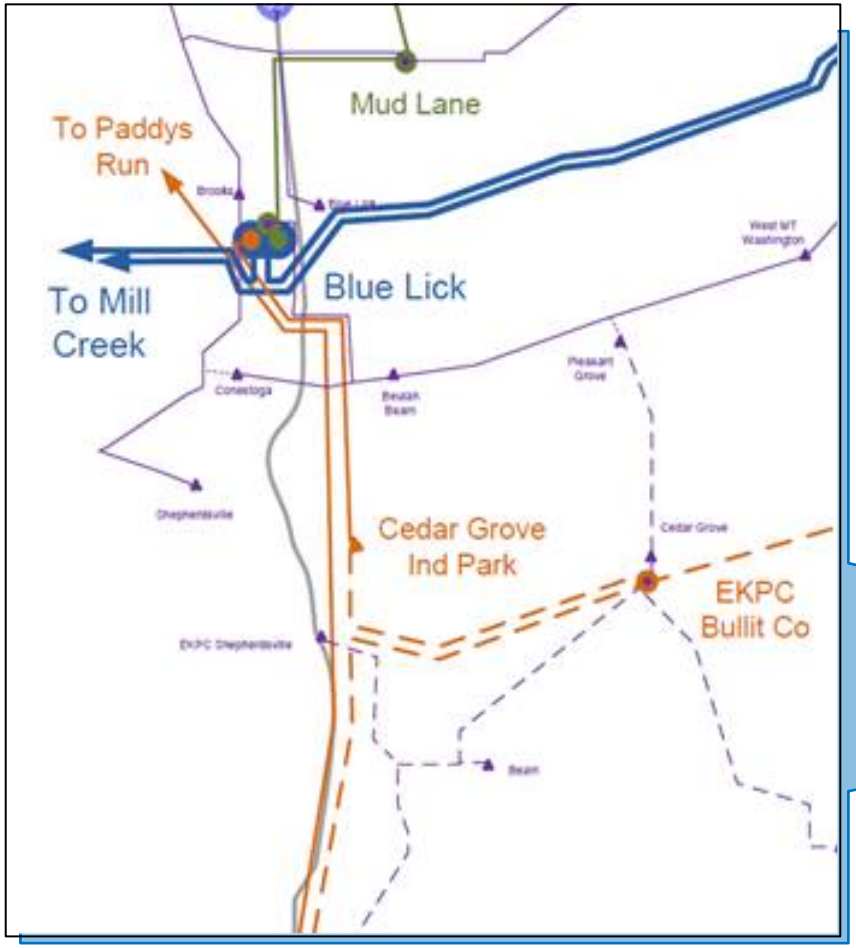
Southeastern Regional TRANSMISSION PLANNING

LG&E/KU Balancing Authority Area

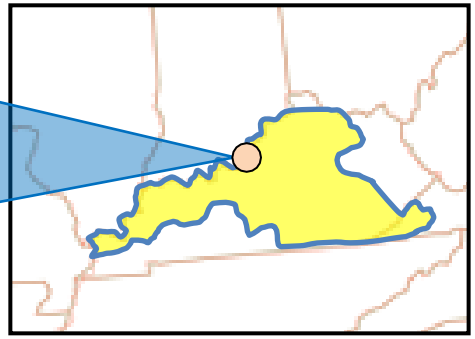
LG&E/KU - 1

- **2024**

BLUE LICK – CEDAR GROVE 161 KV



- **DESCRIPTION:**
  - Reconductor approximately 4.7 miles of the Blue Lick - Cedar Grove 161 kV transmission line with 795 ACSR or better.
- **SUPPORTING STATEMENT:**
  - The Blue Lick – Cedar Grove 161 KV transmission line overloads under contingency.



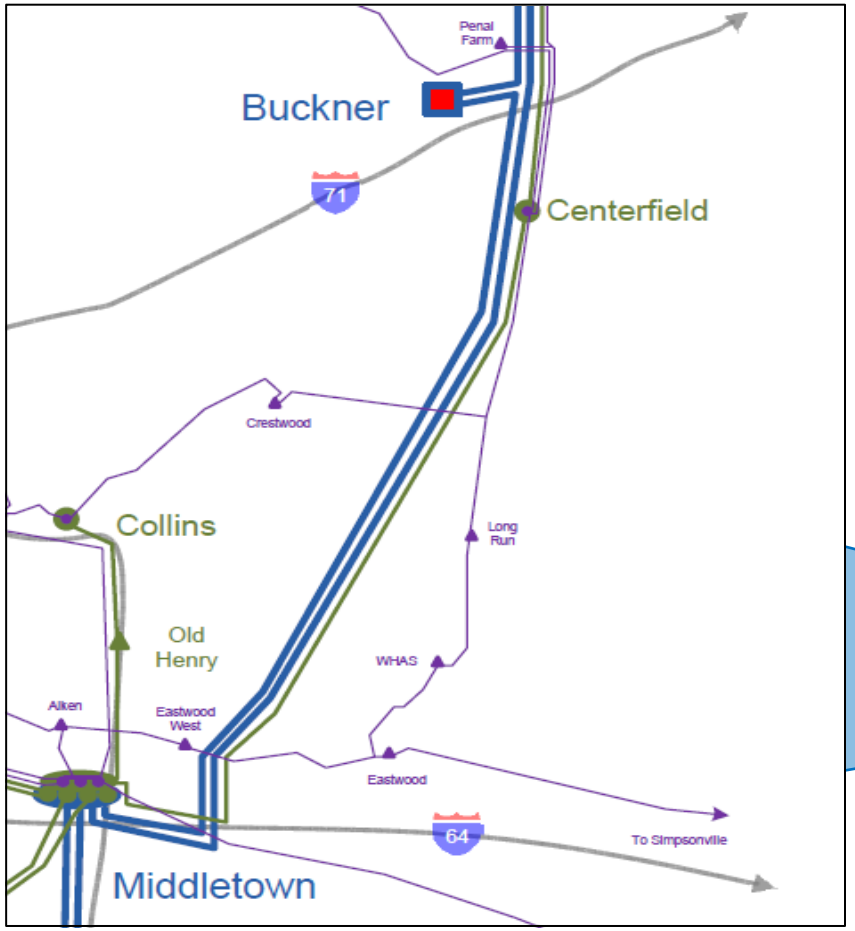
Southeastern Regional TRANSMISSION PLANNING

LG&E/KU Balancing Authority Area

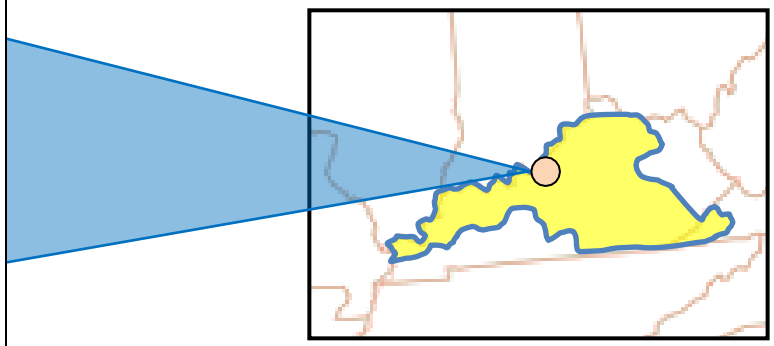
LG&E/KU - 2

- **2024**

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.



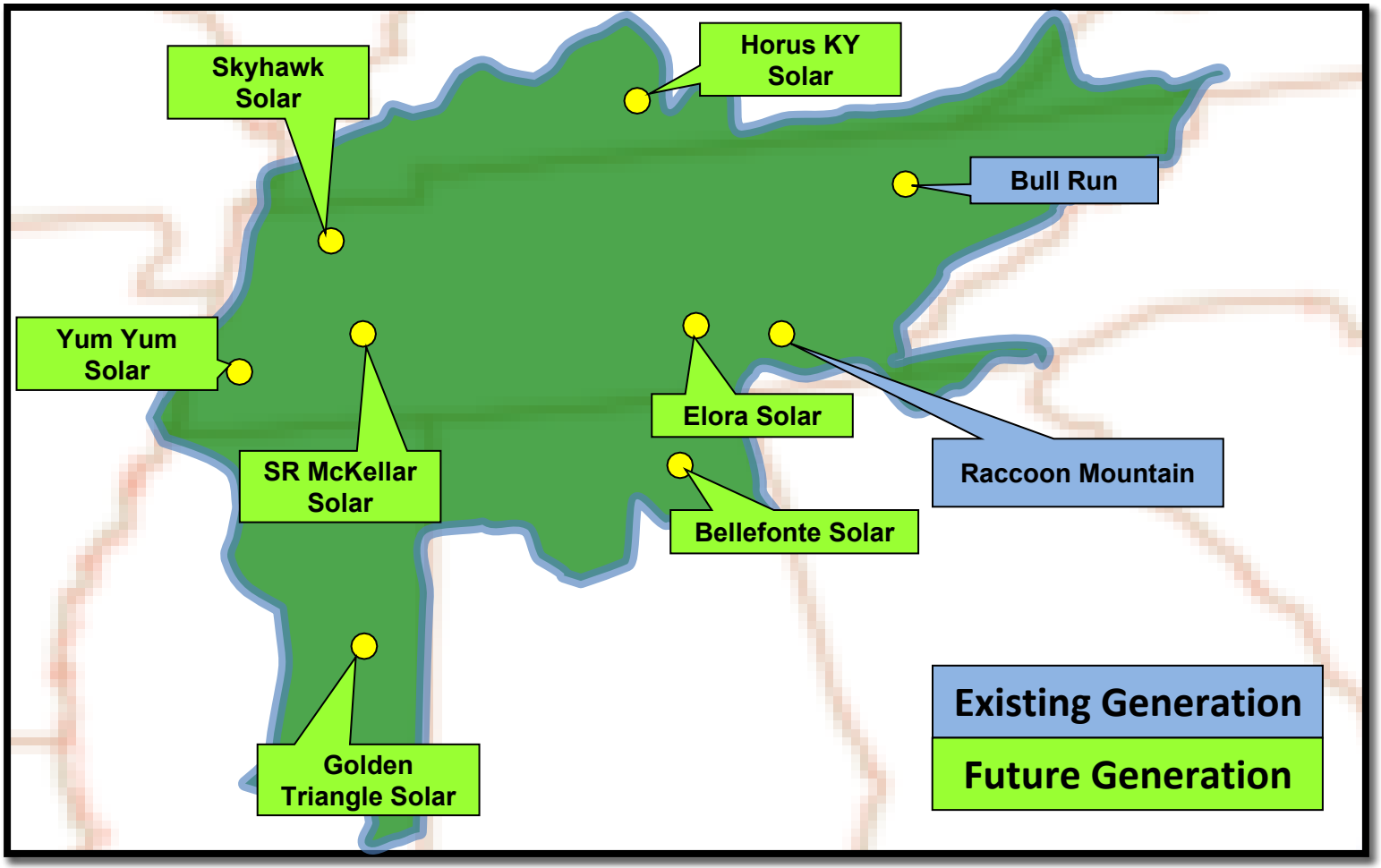
TVA Balancing Authority Area

Generation Assumptions

TVA Balancing Authority Area

TVA – Generation Assumptions

The following diagram depicts the location of generation assumptions that change throughout the ten year planning horizon for the 2022 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 2022 SERTP Process. The years shown represent Summer Peak conditions.

SITE	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
RACOON MTN GEN 3	440	440	440	440	440	440	440	440	440	440
BULL RUN FP UNIT 1	925	925	0	--	--	--	--	--	--	--
BELLEFONTE SOLAR	150	150	150	150	150	150	150	150	150	150
ELORA SOLAR	150	150	150	150	150	150	150	150	150	150
YUM YUM SOLAR	147	147	147	147	147	147	147	147	147	147
GOLDEN TRIANGLE SOLAR	--	200	200	200	200	200	200	200	200	200
HORUS KY SOLAR	--	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
SKYHAWK SOLAR	--	100	100	100	100	100	100	100	100	100
SR MCKELLAR SOLAR	--	80	80	80	80	80	80	80	80	80

TVA Balancing Authority Area

Preliminary Transmission Expansion Plan

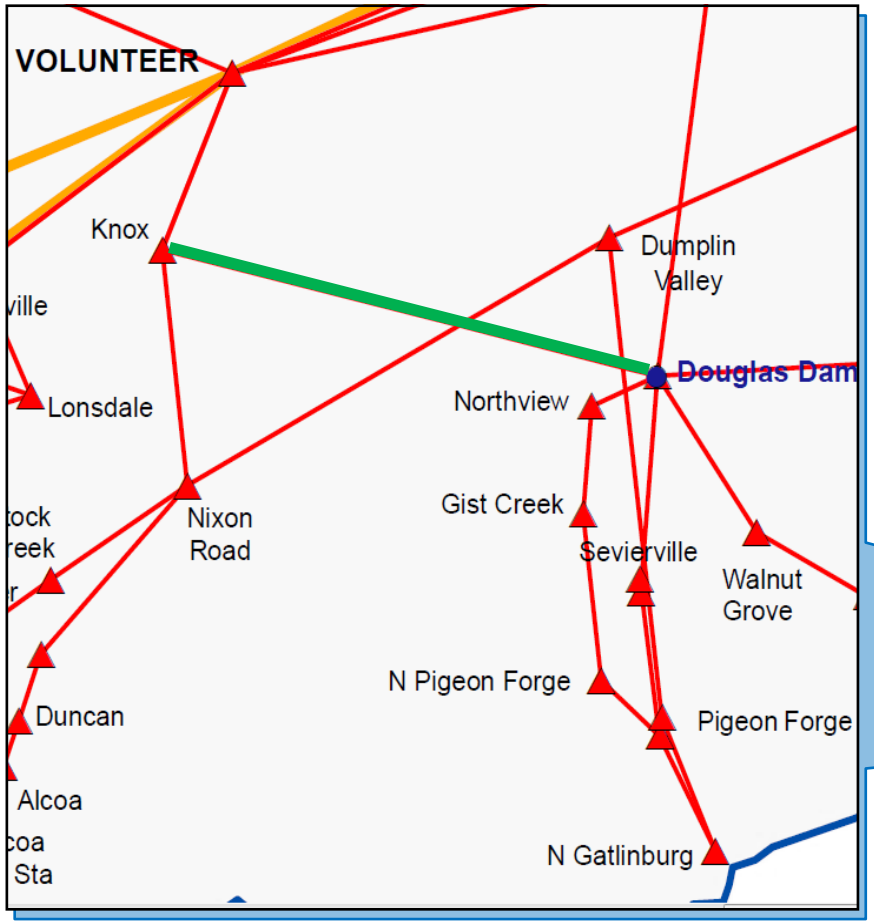
Southeastern Regional TRANSMISSION PLANNING

TVA Balancing Authority Area

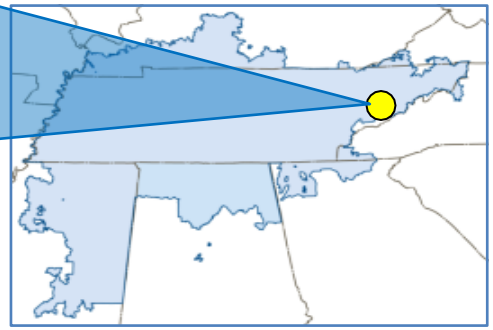
TVA – 1

- **2022**

KNOX – DOUGLAS 161 KV TRANSMISSION LINE



- **DESCRIPTION:**
  - Rebuild approximately 15.0 miles of the Knox to Douglas 161 kV transmission line with 954 ACSS at 125°C.
- **SUPPORTING STATEMENT:**
  - The Knox to Douglas 161 kV transmission line overloads under contingency.



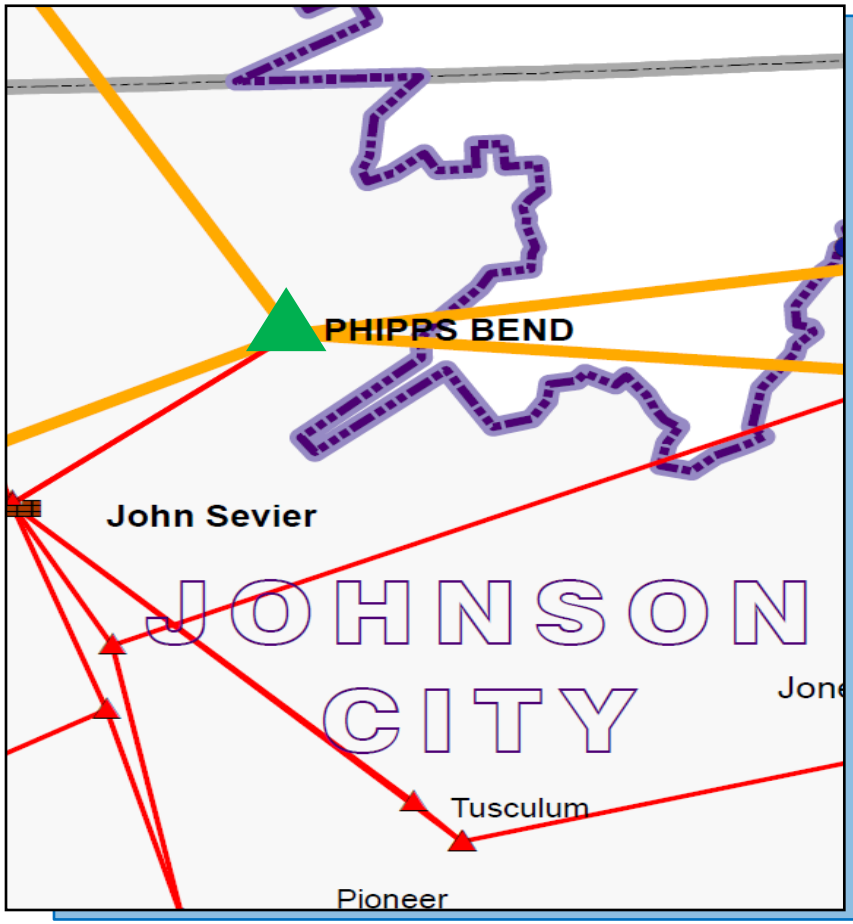
Southeastern Regional TRANSMISSION PLANNING

TVA Balancing Authority Area

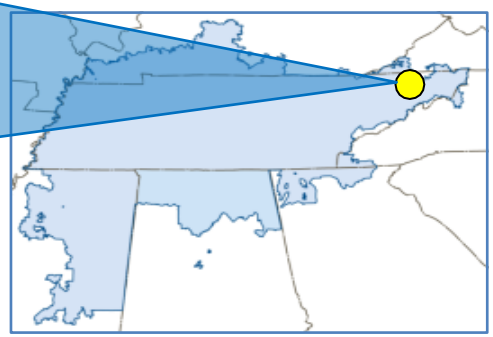
TVA – 2

- **2022**

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.



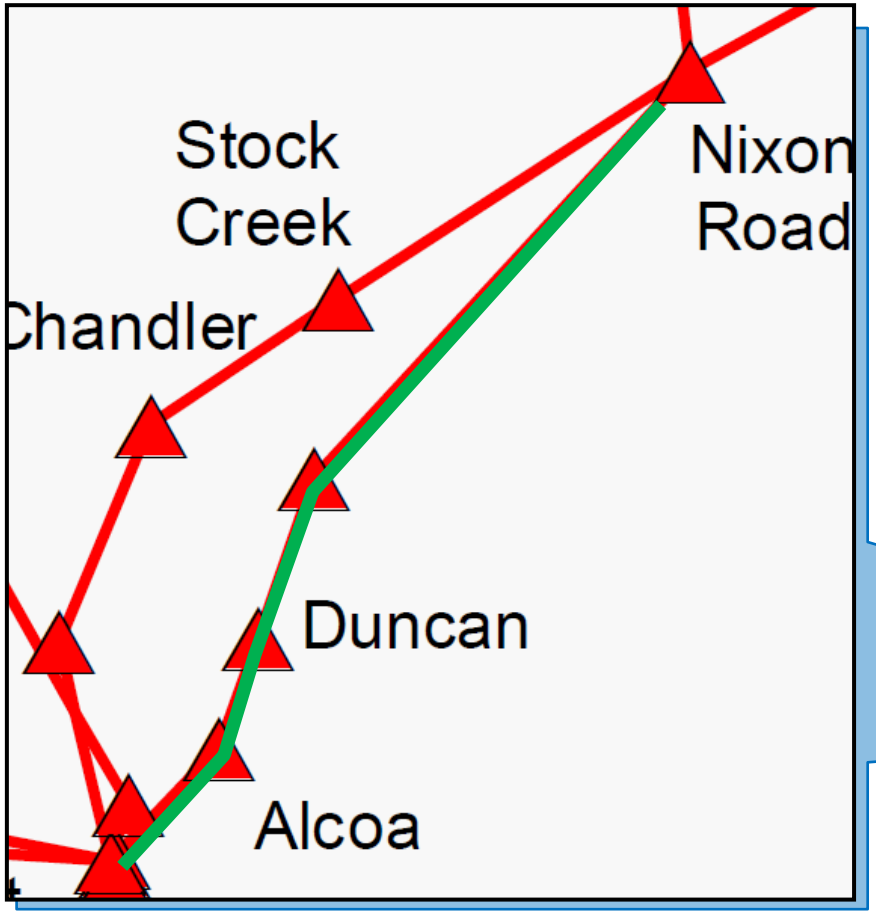
Southeastern Regional TRANSMISSION PLANNING

TVA Balancing Authority Area

TVA – 3

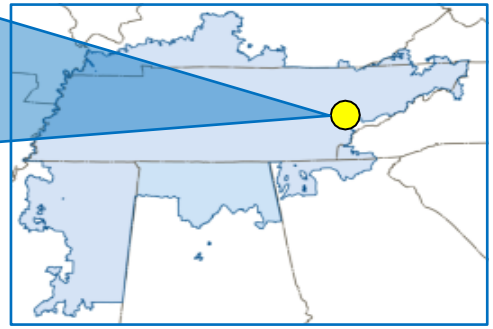
- **2023**

ALCOA SS – NIXON ROAD 161 KV TRANSMISSION LINE



- **DESCRIPTION:**
  - Rebuild approximately 12.0 miles of the Alcoa North to Nixon Road 161 kV transmission line with 1590 ACSR at 100°C and construct approximately 2.0 miles of new transmission line to create the Alcoa SS to Nixon Rd 161 kV #2 transmission line.

- **SUPPORTING STATEMENT:**
  - The existing Alcoa Switching Station to Nixon Road 161 kV transmission line overloads under contingency.



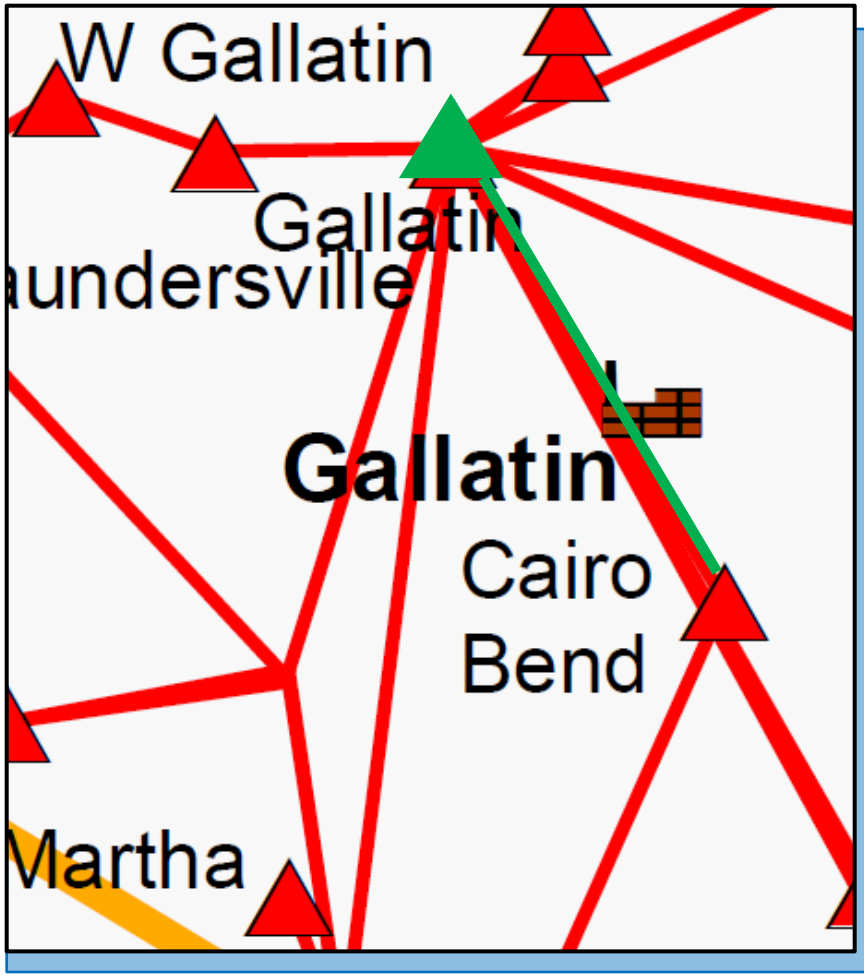
Southeastern Regional TRANSMISSION PLANNING

TVA Balancing Authority Area

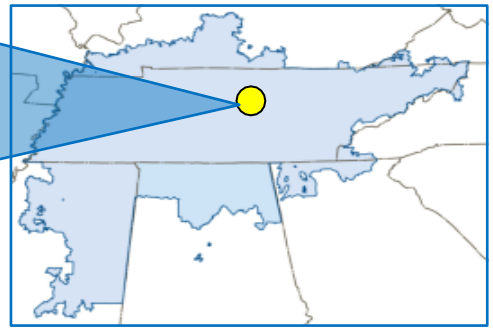
TVA – 4

- **2023**

GALLATIN - CAIRO BEND 161 KV TRANSMISSION LINE



- **DESCRIPTION:**
  - Reconductor approximately 2.2 miles of the Gallatin - Cairo Bend 161 kV transmission line section with 954 ACSS at 150°C and upgrade terminal equipment to 440 MVA at Gallatin 161 kV.
- **SUPPORTING STATEMENT:**
  - The Gallatin FP - Cairo Bend 161 kV transmission line section overloads under contingency.



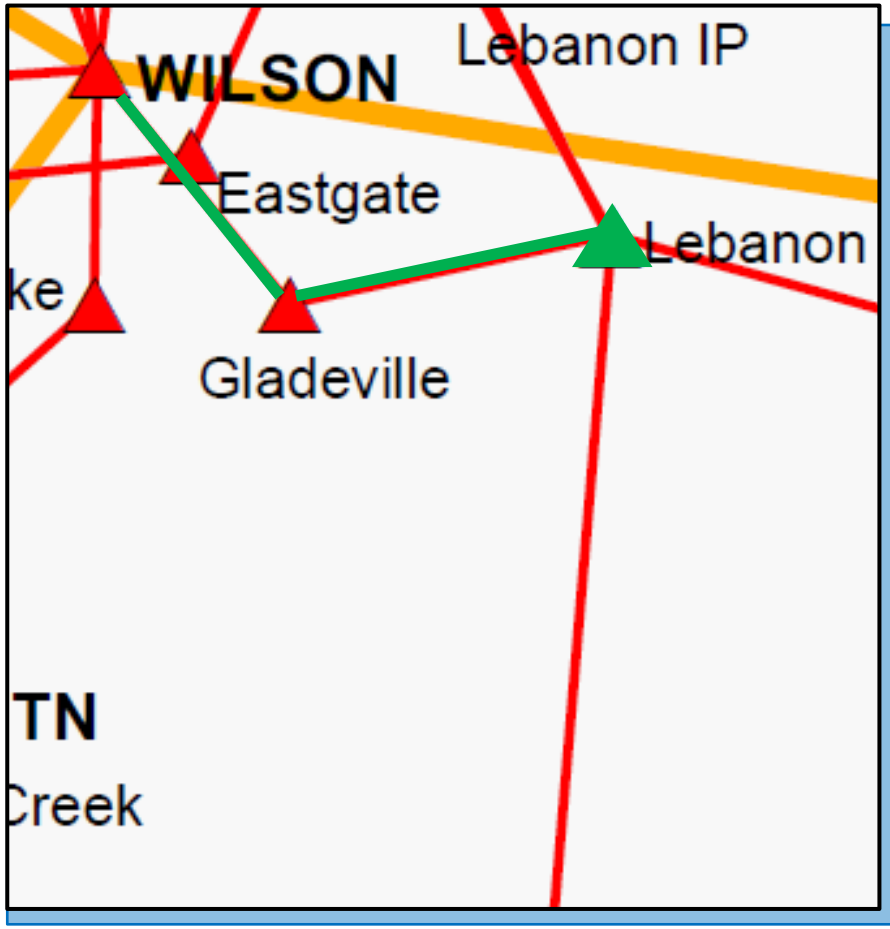
Southeastern Regional TRANSMISSION PLANNING

TVA Balancing Authority Area

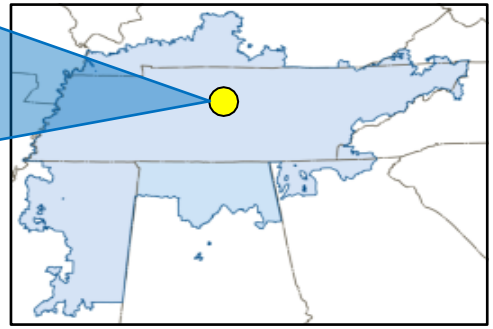
TVA – 5

- **2023**

WILSON - LEBANON 161 KV TRANSMISSION LINE



- **DESCRIPTION:**
  - Rebuild approximately 6.0 miles on the Wilson - Lebanon 161 kV transmission line with 636 ACSR at 100°C and upgrade terminal equipment to 230 MVA at Lebanon 161 kV substation.
- **SUPPORTING STATEMENT:**
  - The Wilson - Lebanon 161 kV transmission line overloads under contingency.



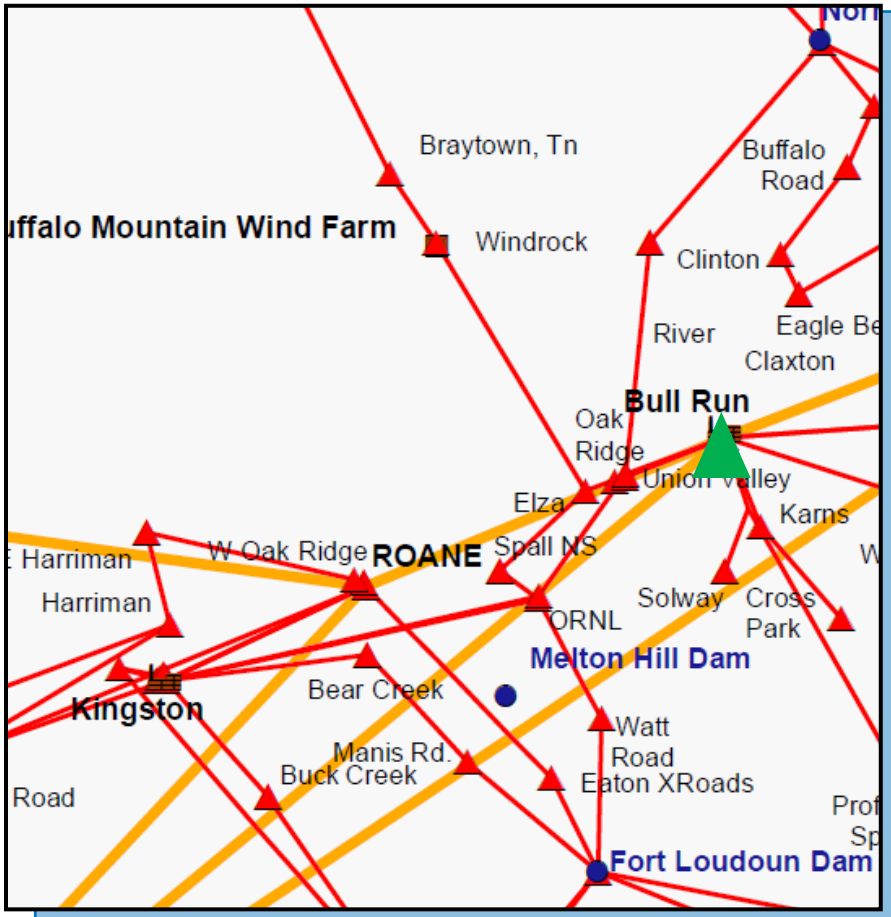
Southeastern Regional TRANSMISSION PLANNING

TVA Balancing Authority Area

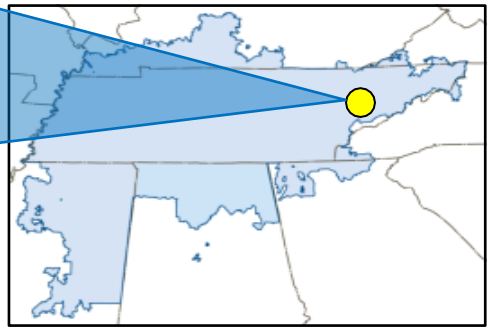
TVA – 6

- **2023**

ANDERSON 500 KV SUBSTATION



- **DESCRIPTION:**
  - Build new Anderson 500kV Substation and build Anderson 500/161 kV transformer bank.
- **SUPPORTING STATEMENT:**
  - Area 500/161 kV transformer overloads under contingency.



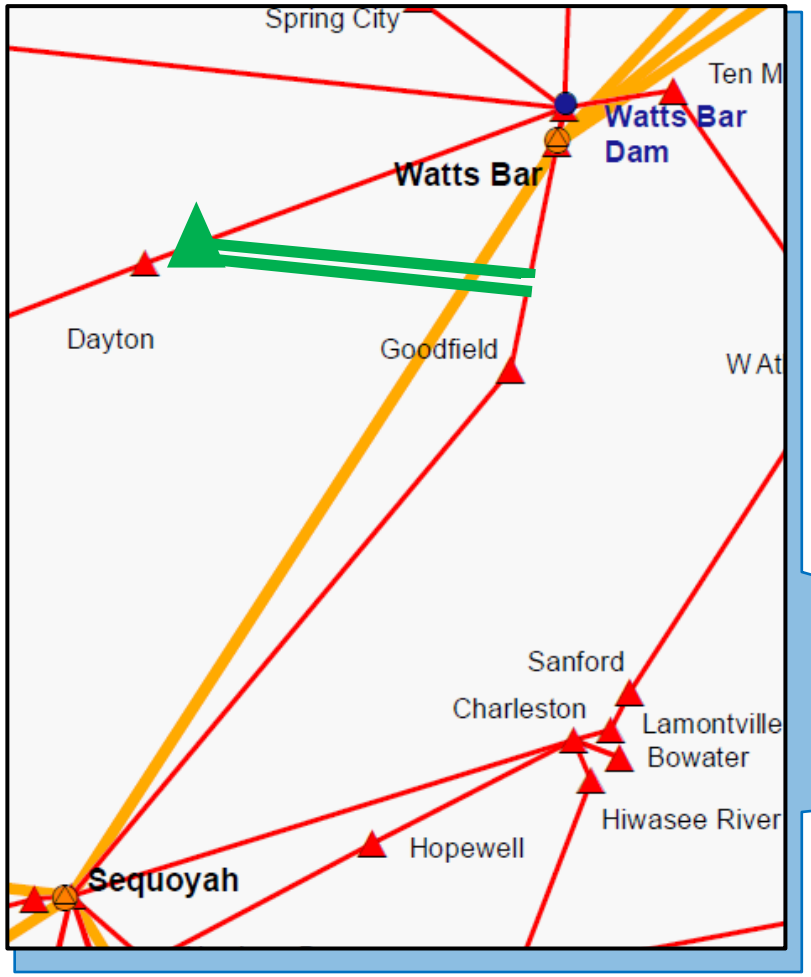
Southeastern Regional TRANSMISSION PLANNING

TVA Balancing Authority Area

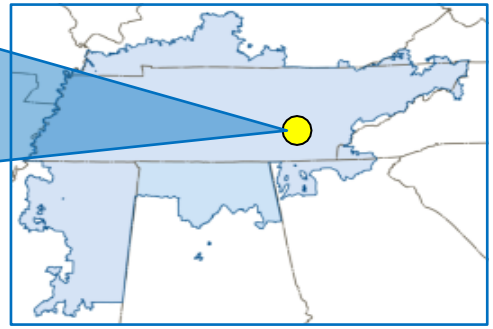
TVA – 7

- **2023**

N. DAYTON SUBSTATION



- **DESCRIPTION:**
  - Construct North Dayton 161 kV substation. Loop in Sequoyah - WBHP 161 kV transmission line into new substation by constructing approximately 27.0 miles of transmission line using 1351 ACSR.
- **SUPPORTING STATEMENT:**
  - Thermal overloads and voltage support is needed in the North Dayton, TN area under contingency.



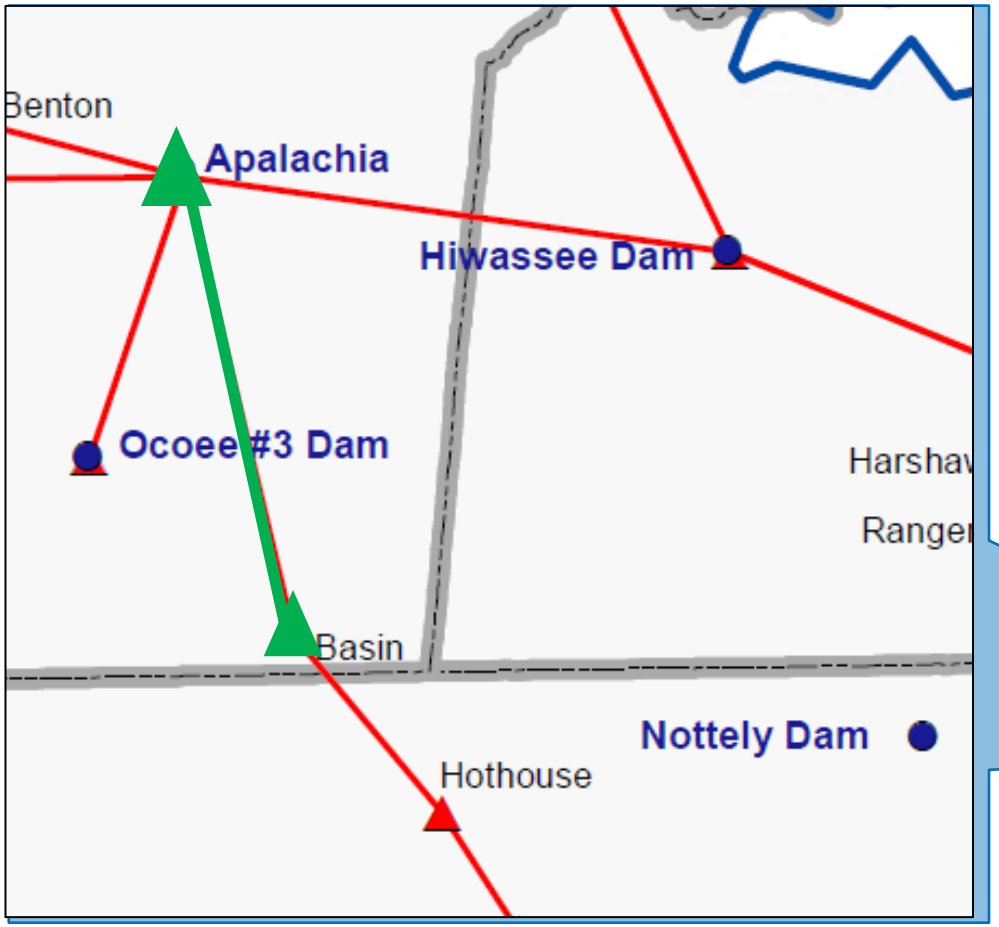
Southeastern Regional TRANSMISSION PLANNING

TVA Balancing Authority Area

TVA – 8

• **2025**

APALACHIA - BASIN RECONDUCTOR/UPRATE

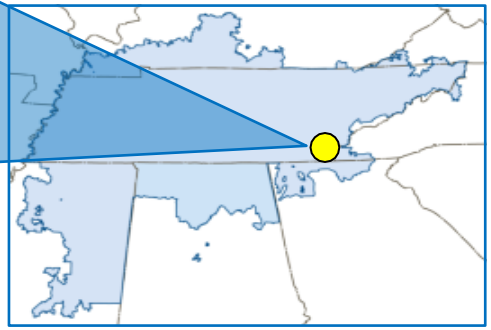


DESCRIPTION:

– Reconductor the 8.4 miles of ACSR 477, replace a wave trap at Basin, and reset a CT at Apalachia.

SUPPORTING STATEMENT:

– The Apalachia - Basin 161 kV transmission line overloads under contingency.



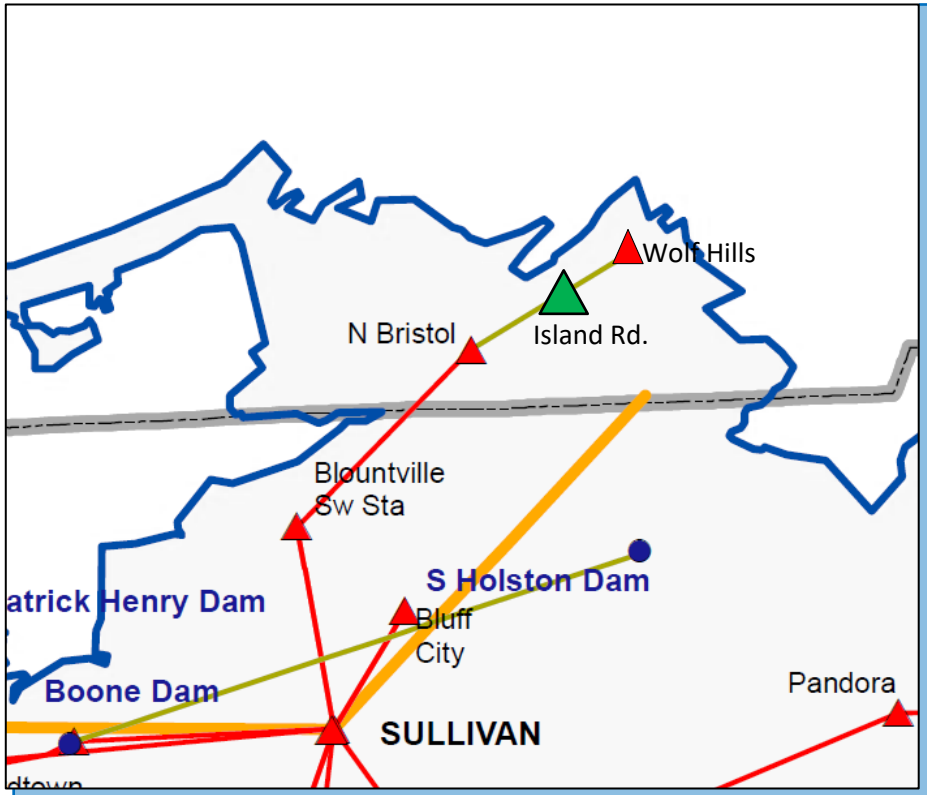
Southeastern Regional TRANSMISSION PLANNING

TVA Balancing Authority Area

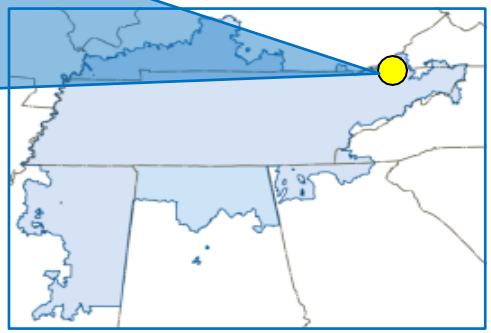
TVA – 9

• **2025**

ISLAND RD 138KV CAPACITOR BANK



- **DESCRIPTION:**
  - Construct the Island Road 138kV Substation with a minimum of a 72MVAR capacitor bank.
- **SUPPORTING STATEMENT:**
  - Voltage support is needed in the North Bristol, TN area under contingency.



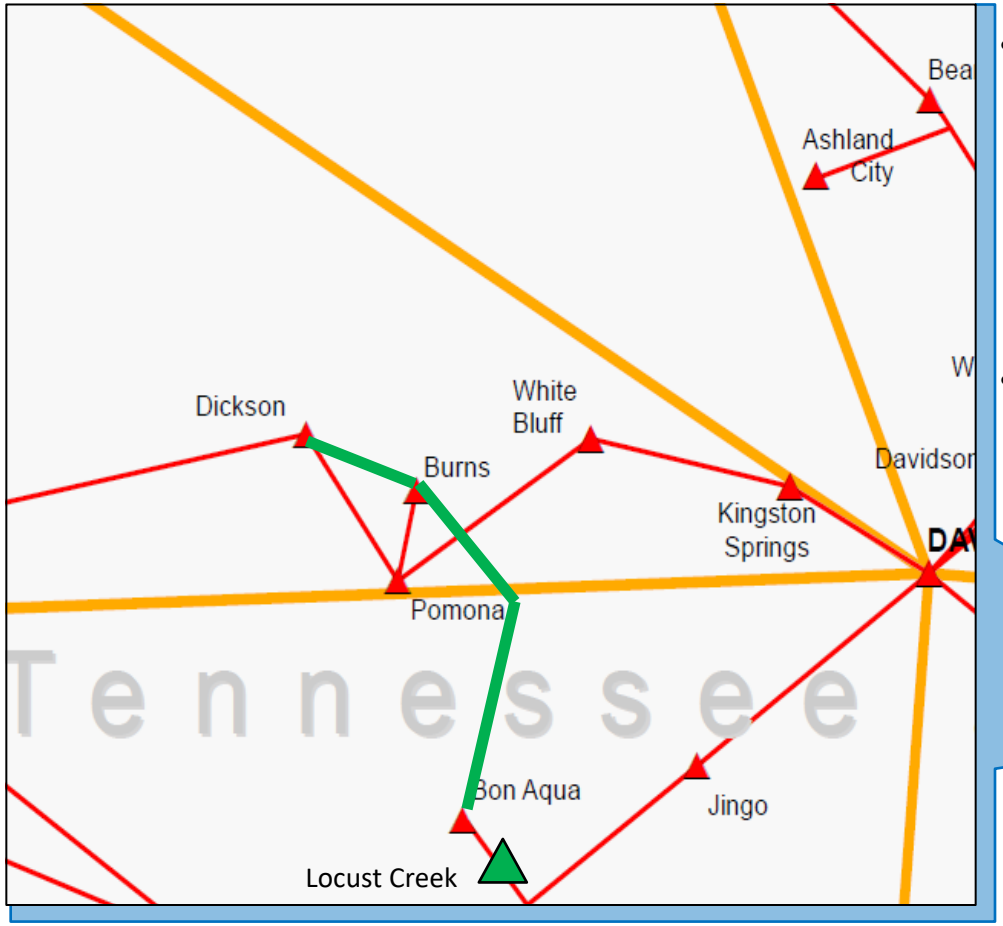
Southeastern Regional TRANSMISSION PLANNING

TVA Balancing Authority Area

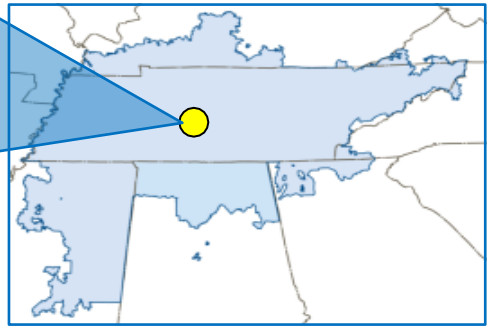
TVA – 10

• **2026**

DICKSON 161 KV AREA IMPROVEMENT



- **DESCRIPTION:**
  - Construct approximately 19.5 miles of new 161 kV transmission line from Bon Aqua to Burns, construct approximately 4.3 miles new 161 kV double circuit into Dickson, and construct a new Locust Creek 161 kV Substation.
- **SUPPORTING STATEMENT:**
  - Voltage support is needed in the Dickson, TN area under contingency.



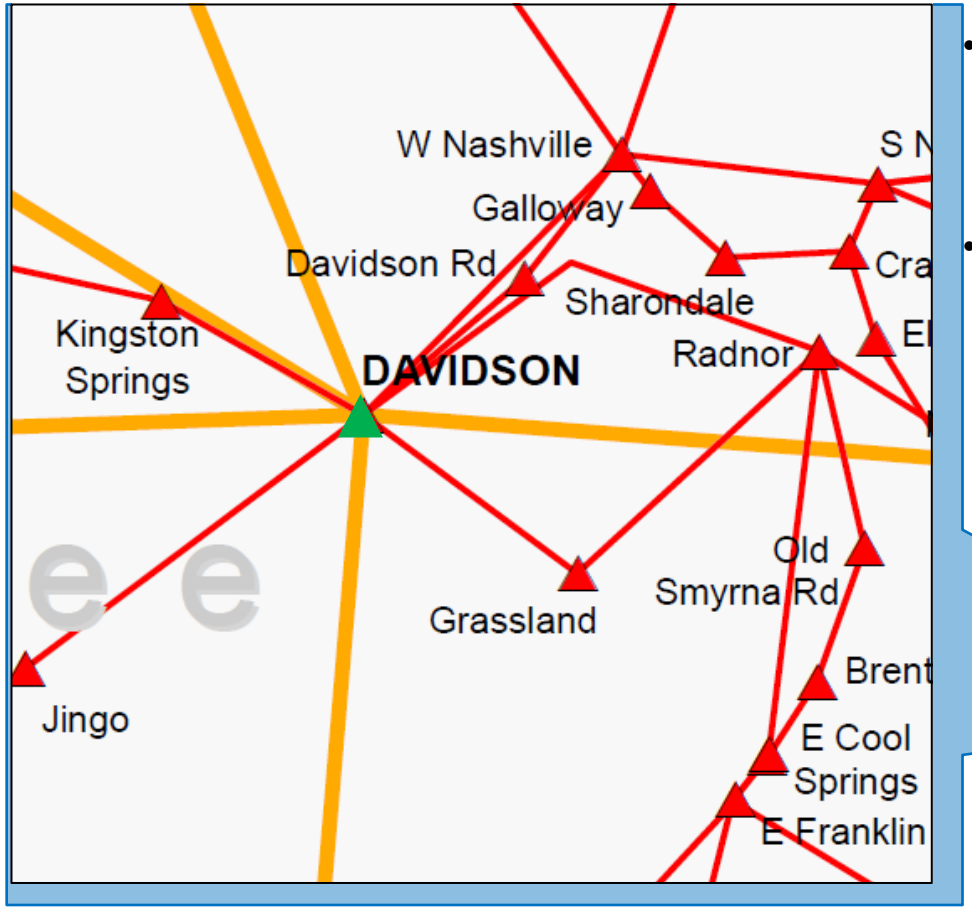
Southeastern Regional TRANSMISSION PLANNING

TVA Balancing Authority Area

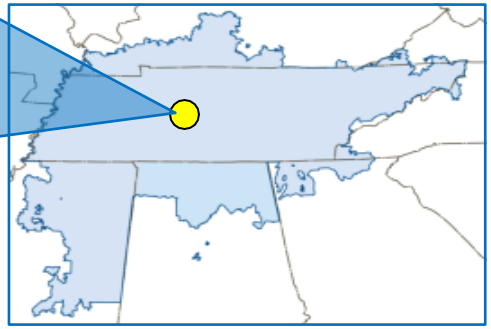
TVA – 11

- **2027**

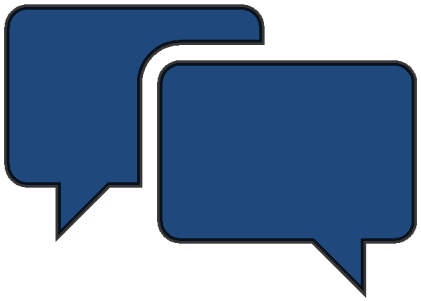
DAVIDSON 500KV SWITCH HOUSE



- **DESCRIPTION:**
  - Construct a new 500 kV switch house with all new assets and replace aging assets in the Davidson Yard.
- **SUPPORTING STATEMENT:**
  - Additional thermal capacity and voltage support is needed in the Davidson County, TN area under contingency.



2022 SERTP



Questions?

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