Southeastern Regional TRANSMISSION PLANNING

SERTP – 4th Quarter Meeting

Annual Transmission Planning Summit & Assumptions Input Meeting

December 3rd, 2020

WebEx

Process Information

- The SERTP process is a transmission planning process.
- Please contact the respective transmission provider for questions related to real-time operations or Open Access Transmission Tariff (OATT) transmission service.
- SERTP Website Address:
  - www.southeasternrtp.com

2020 SERTP

Agenda

- **Economic Planning Studies**
  - Final Results
- **2020 Preliminary Modeling Input Assumptions**
  - Planning Horizon 2022-2031
- **Ten (10) Year Regional Transmission Plan**
  - Planning Horizon 2021-2030
- **SERTP Regional Transmission Analyses**
- **Miscellaneous Updates**
- **Upcoming 2021 SERTP Process**

SERTP

Economic Planning Studies

Economic Planning Studies

Economic Planning Studies Process

- Economic Planning Studies were chosen by the Regional Planning Stakeholder Group "RPSG" in March at the 2020 SERTP 1st Quarter Meeting.

- Key study criteria, methodologies, and input assumptions were finalized in May.

- These studies represent analyses of hypothetical scenarios requested by the stakeholders and **do not** represent an actual transmission need or commitment to build.

Economic Planning Studies

Economic Planning Studies Process

- **SERTP Sponsors identify the transmission requirements needed to move large amounts of power above and beyond existing long-term, firm transmission service commitments**
  - Analysis are consistent with NERC standards and company-specific planning criteria

- **Models used to perform the analysis incorporate the load forecasts and resource decisions as provided by LSEs**
  - Power flow models are made available to stakeholders to perform additional screens or analysis

Economic Planning Studies

Economic Planning Studies

- **MISO North Region to LGEE**
  - 200 MW (2022 Summer Peak)
- **PJM to LGEE**
  - 200 MW (2022 Summer Peak)

Economic Planning Studies

Power Flow Cases Utilized

- **Study Years:**
  - 2022

- **Load Flow Cases:**
  - 2020 Series Version 1 SERTP Regional Models
  - Summer Peak

Economic Planning Studies

Final Report Components

- **The SERTP reported, at a minimum, results on elements of 115 kV and greater:**
  - Thermal loadings greater than 90% for facilities that are negatively (+5% ~ Significant Constraints) impacted by the proposed transfers
  - Voltages appropriate to each participating transmission owner's planning criteria
  - Overloaded facilities that had a low response to the requested transfer were excluded and issues identified that are local in nature were also excluded

- **For each economic planning study request, the results of that study include:**

1. Limit(s) to the transfer
2. Potential transmission enhancement(s) to address the limit(s)
3. Planning-level cost estimates and in-service dates for the selected transmission enhancement(s)

Economic Planning Studies

Process Information

- The following information depicts potential enhancements for the proposed transfer levels above and beyond existing, firm commitments. Therefore, this information does not represent a commitment to proceed with the recommended enhancements nor implies that the recommended enhancements could be implemented by the study dates (2021 or 2025).

- These potential solutions only address constraints identified within the SERTP Sponsors' areas that are associated with the proposed transfers. Other Balancing Areas were not monitored which could result in additional limitations and required system enhancements.

Economic Planning Studies

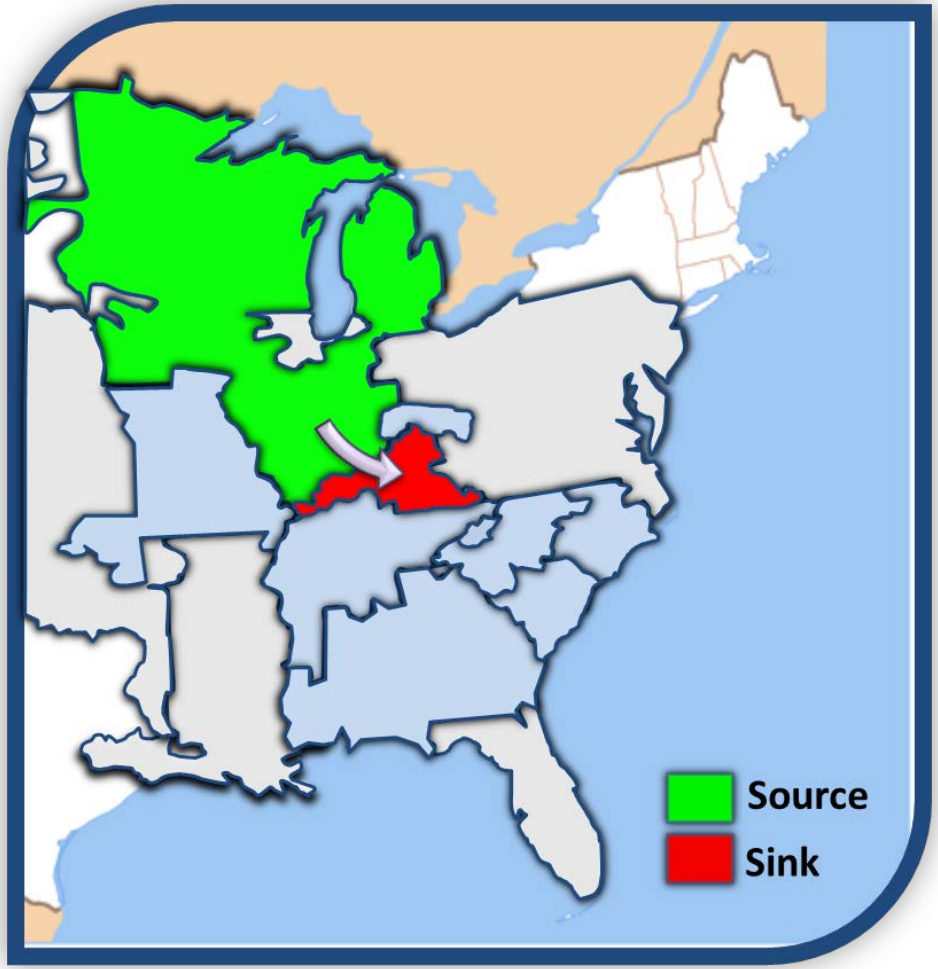
Economic Planning Studies – Preliminary Results

MISO North Region to LGEE – 200 MW

MISO North – LGEE 200 MW

Study Assumptions

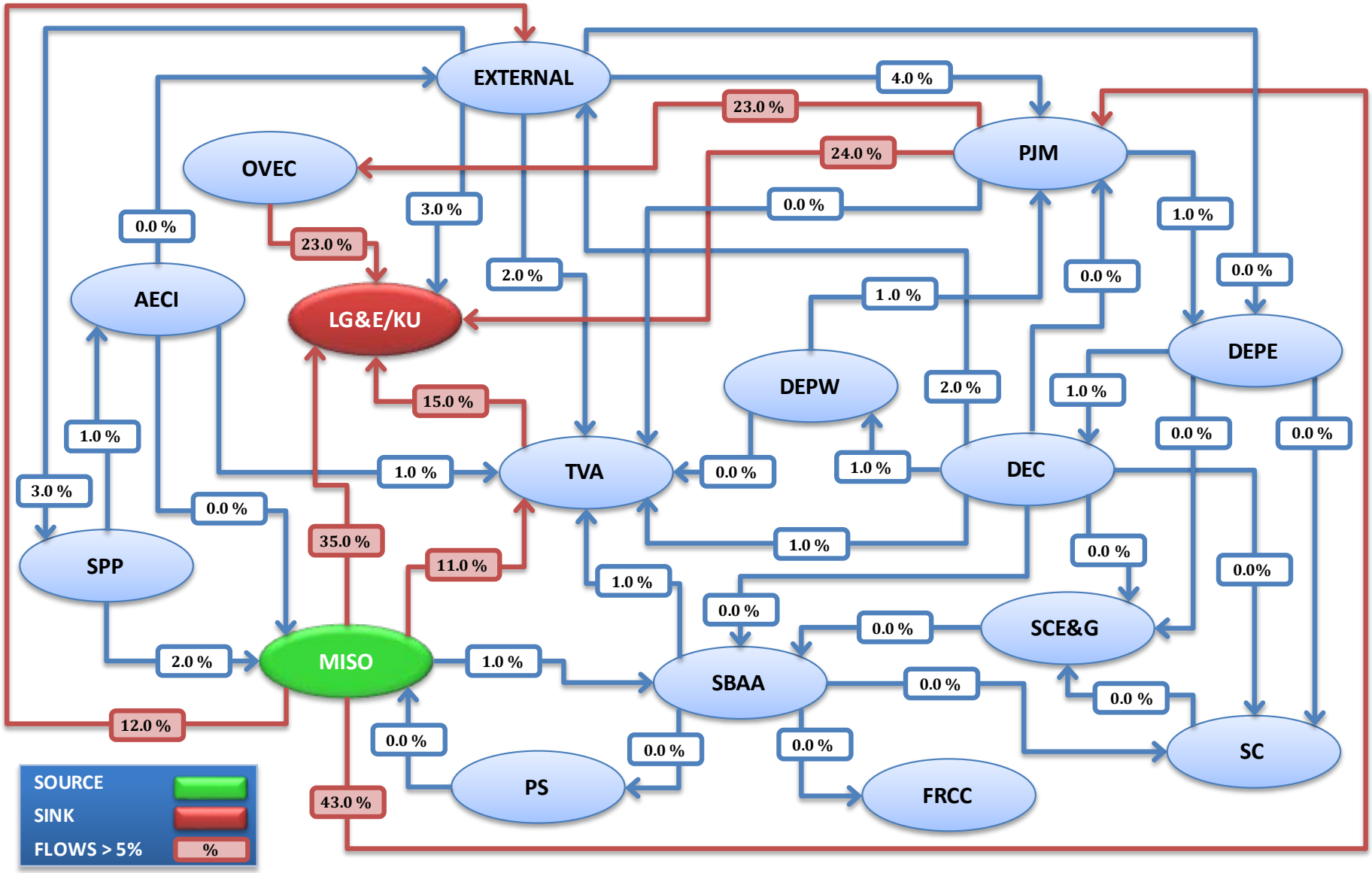
- **Source:** Uniform Generation Scale within MISO North
- **Sink:** Generation within LG&E/KU
- **Transfer Type:** Generation to Generation
- **Year:** 2022
- **Load Level:** Summer Peak



Southeastern Regional
TRANSMISSION PLANNING

MISO North – LGEE 200 MW

Transfer Flow Diagram (% of Total Transfer)



MISO North – LGEE 200 MW

Transmission System Impacts

- **Transmission System Impacts Identified:**
  - Significant constraints were identified in the following SERTP Balancing Authority Areas:
    - LGEE

- **Potential Transmission Enhancements Identified:**
  - (LGEE) One (1) 69kV Transmission Line Upgrades

SERTP TOTAL ($2020) = $121,129

MISO North – LGEE 200 MW

Significant Constraints Identified – *LGEE*

Table 1: Significant Constraints - LGEE

Potential Enhancement	Limiting Element	Rating (MVA)	Thermal Loadings (%)	
			Without Request	With Request
P1	Caron – Fariston 69kV T.L.	57	94.5%	101.5%

Potential Enhancements Identified – *LGEE*

Table 2: Potential Enhancements - LGEE

Item	Potential Enhancement	Planning Level Cost Estimate
P1	**Caron – Fariston 69kV double T.L.** • Increase the maximum operating temperature of 2.37 miles of 397.5 MCM 26X7 ACSR in the Caron to Fariston 69kV line section from 160˚F to a minimum of 176˚F.	**$121,129**
LGEE TOTAL ($2020)		**$ 121,129**(1)

(1) Total planning level cost estimate does not include the cost of projects that are included in SERTP Sponsors' expansion plans and are scheduled to be completed by June 1st of the study year. The studied transfer depends on these projects being in-service, and the cost to support the study transfer could be greater than the total shown above if any of these projects are delayed or cancelled.

MISO North – LGEE 200 MW

Potential Enhancement Locations – *LGEE*

MISO North – LGEE 200 MW

Transmission System Impacts – *SERTP*

Table 3: Transmission System Impacts - SERTP

Balancing Authority	Planning Level Cost Estimate
Associated Electric Cooperative (AECI)	$0
Duke Carolinas (DEC)	$0
Duke Progress East (DEPE)	$0
Duke Progress West (DEPW)	$0
Louisville Gas & Electric and Kentucky Utilities (LG&E/KU)	$121,129
PowerSouth (PS)	$0
Southern (SBAA)	$0
Tennessee Valley Authority (TVA)	$0
SERTP TOTAL ($2020)	**$121,129**

Economic Planning Studies

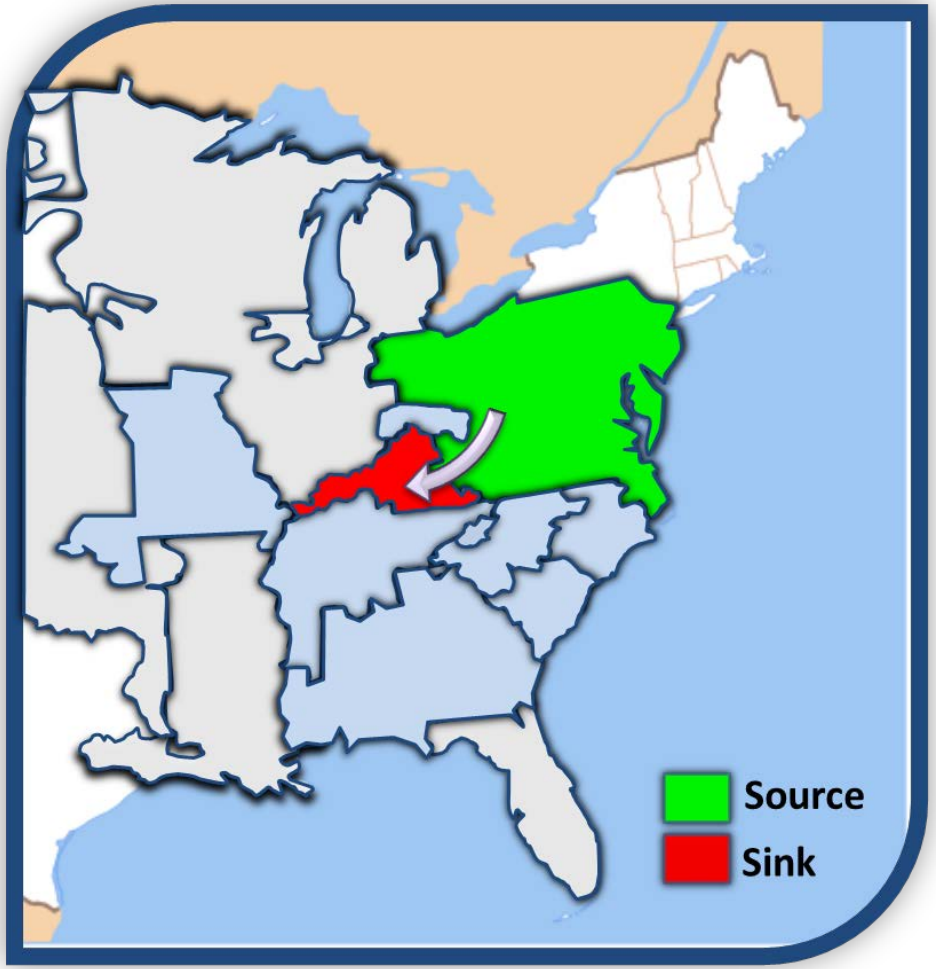
Economic Planning Studies – Preliminary Results

PJM to LGEE – 200 MW

PJM – LGEE 200 MW

Study Assumptions

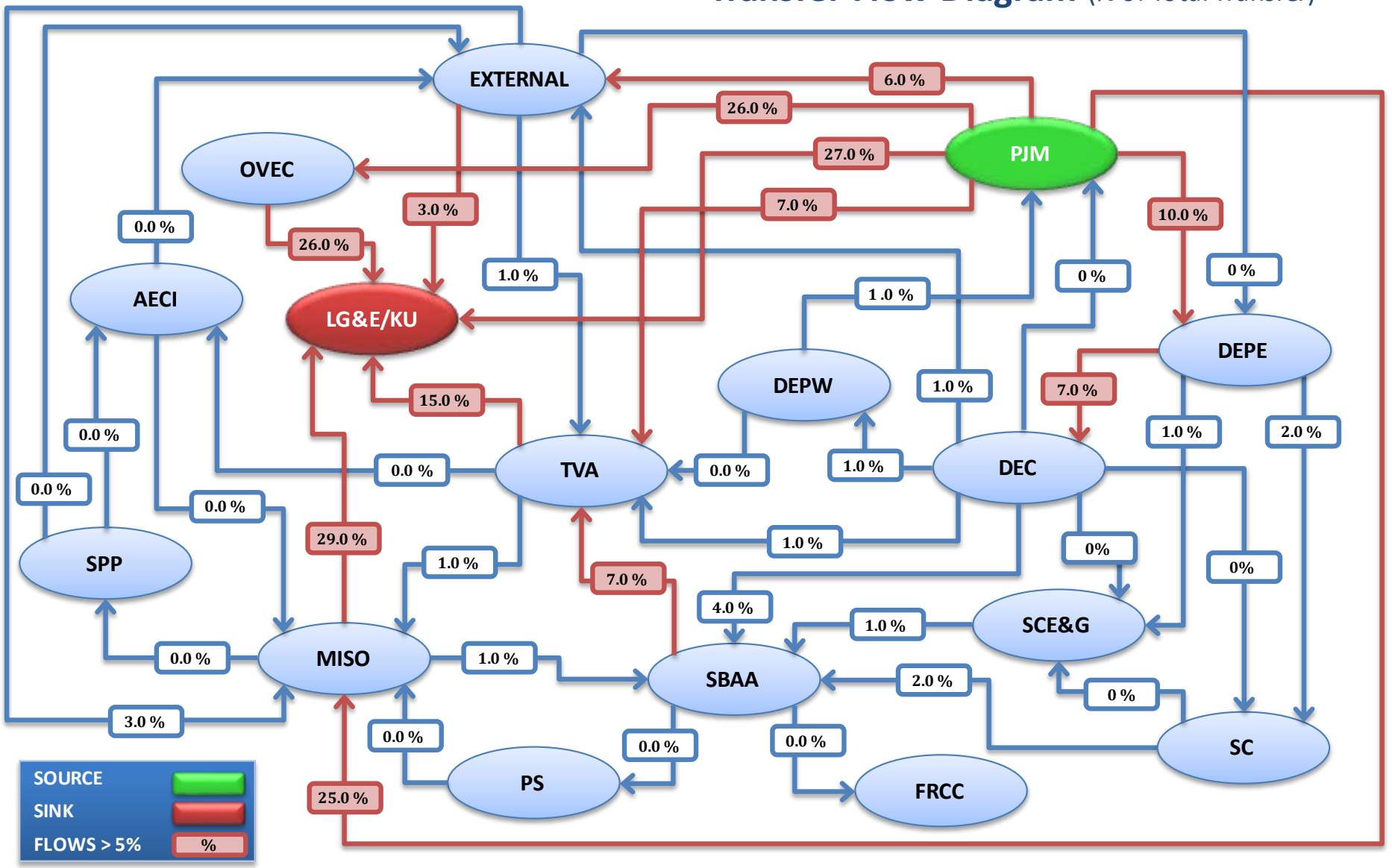
- **Source:** Uniform Generation Scale within PJM
- **Sink:** Generation with LG&E/KU
- **Transfer Type:** Generation to Generation
- **Year:** 2022
- **Load Level:** Summer Peak



Southeastern Regional
TRANSMISSION PLANNING

PJM – LGEE 200 MW

Transfer Flow Diagram (% of Total Transfer)



PJM – LGEE 200 MW

Transmission System Impacts – *SERTP*

- **Transmission System Impacts Identified:**
  - Significant constraints were identified in the following SERTP Balancing Authority Areas:
    - ***LGEE***

- **Potential Transmission Enhancements Identified:**
  - (LGEE) One (1) 69kV Transmission Line Upgrades

SERTP Total ($2020) = $121,129

PJM – LGEE 200 MW

Significant Constraints Identified – *LGEE*

Table 1: Significant Constraints - LGEE

Potential Enhancement	Limiting Element	Rating (MVA)	Thermal Loadings (%)	
			Without Request	With Request
P1	Caron – Fariston 69kV T.L.	57	94.5%	101.6%

Potential Enhancements Identified – *LGEE*

Table 2: Potential Enhancements - LGEE

Item	Potential Enhancement	Planning Level Cost Estimate
P1	**Caron – Fariston 69kV double T.L.** • Increase the maximum operating temperature of 2.37 miles of 397.5 MCM 26X7 ACSR in the Caron to Fariston 69kV line section from 160˚F to a minimum of 176˚F.	**$121,129**
LGEE TOTAL ($2020)		**$ 121,129**(1)

(1) Total planning level cost estimate does not include the cost of projects that are included in SERTP Sponsors' expansion plans and are scheduled to be completed by June 1st of the study year. The studied transfer depends on these projects being in-service, and the cost to support the study transfer could be greater than the total shown above if any of these projects are delayed or cancelled.

PJM – LGEE 200 MW

Potential Enhancement Locations – *LGEE*

Transmission System Impacts – *SERTP*

Table 6: Transmission System Impacts - SERTP

Balancing Authority	Planning Level Cost Estimate
Associated Electric Cooperative (AECI)	$0
Duke Carolinas (DEC)	$0
Duke Progress East (DEPE)	$0
Duke Progress West (DEPW)	$0
Louisville Gas & Electric and Kentucky Utilities (LG&E/KU)	$121,129
PowerSouth (PS)	$0
Southern (SBAA)	$0
Tennessee Valley Authority (TVA)	$0
SERTP TOTAL ($2020)	**$121,129**

2020 SERTP

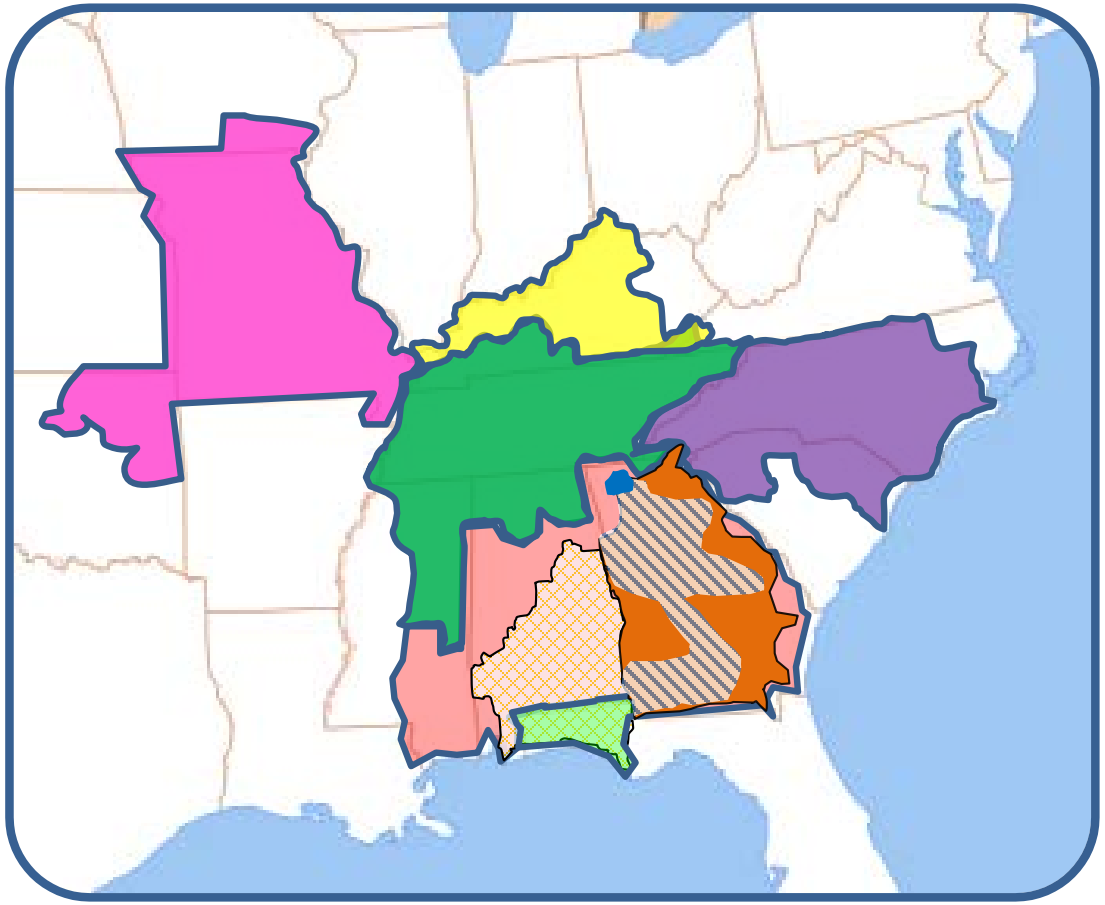
SERTP

Regional Modeling Assumptions

SERTP

Regional Transmission Plan

Southeastern Regional Transmission Planning (SERTP)



SERTP Participants

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

Southeastern Regional Transmission Planning (SERTP)

Balancing Authority Area:

AECI

Duke Carolinas

Duke Progress

LG&E/KU

PowerSouth

Southern

TVA

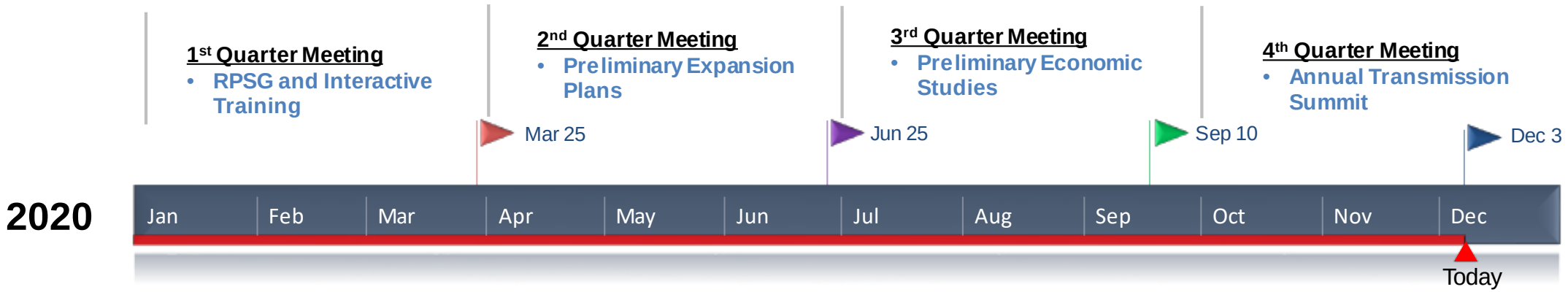
SERTP

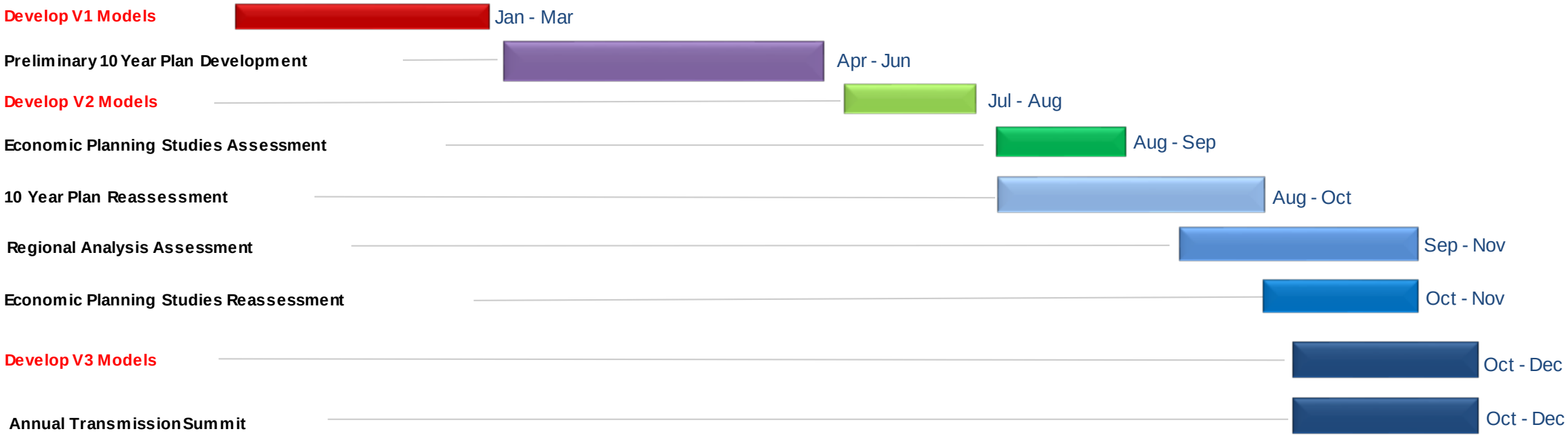
Regional Transmission Expansion Plan Process

Southeastern Regional TRANSMISSION PLANNING

2020 SERTP

10 Year SERTP Regional Transmission Expansion Plan Process



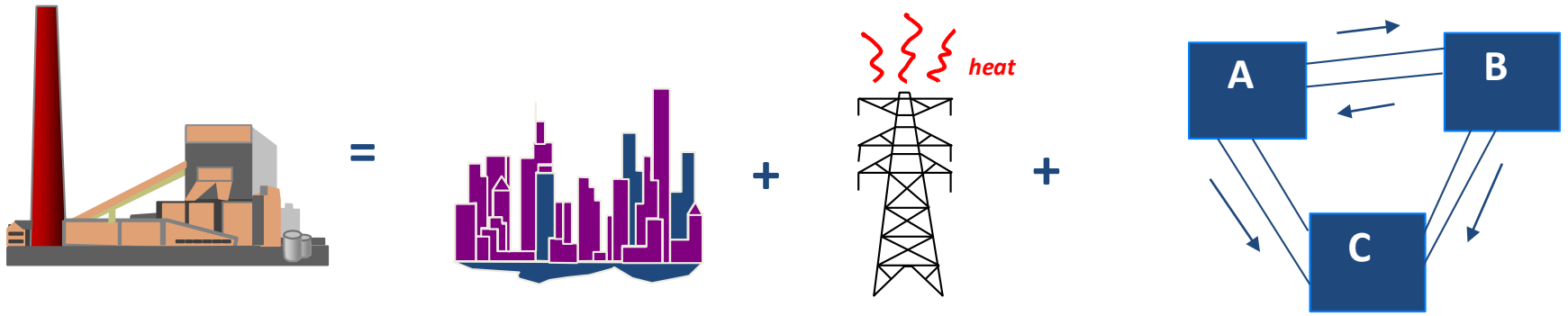


SERTP

Regional Model Assumptions

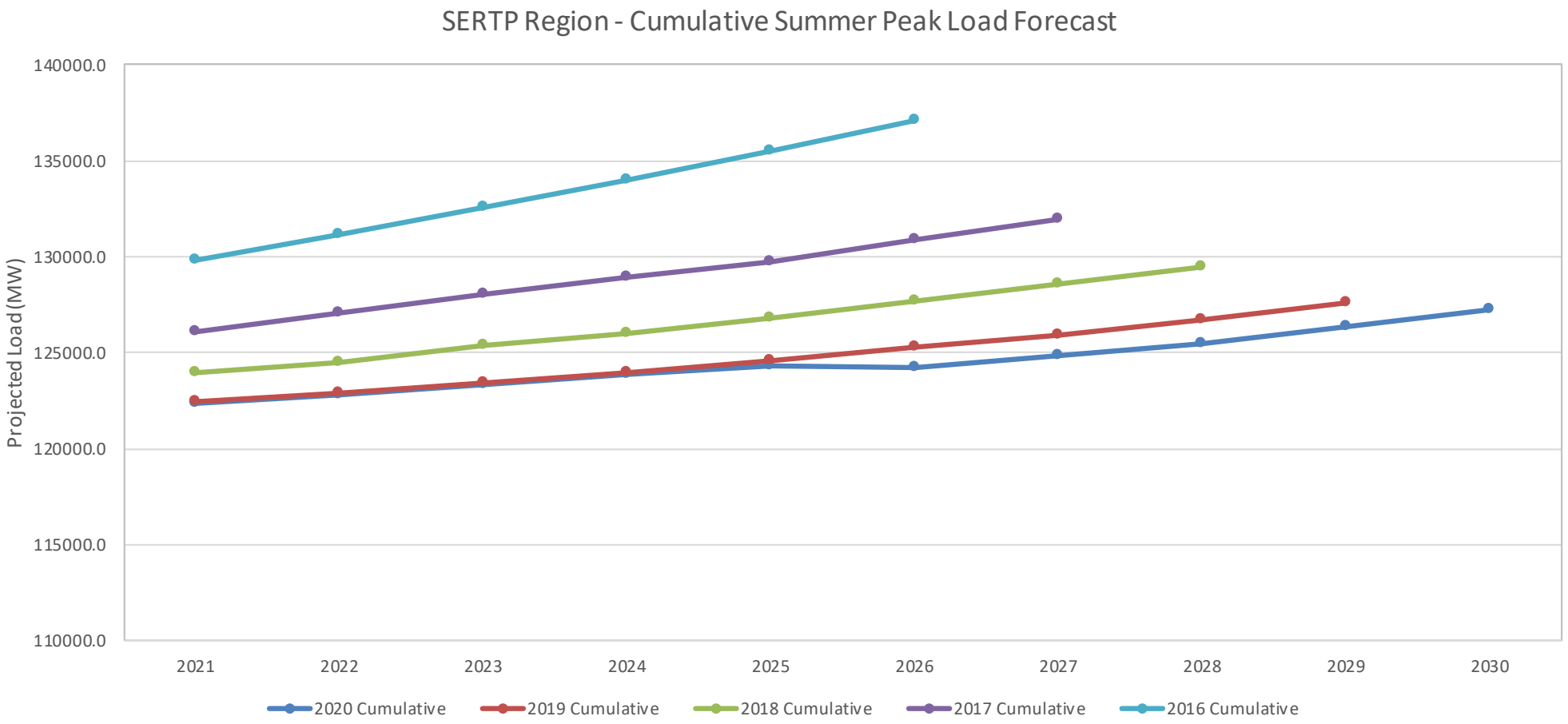
Regional Model Assumptions

Generation = Load + Losses (Topology) + Net Interchange



- Projected load for each year and season
- Losses produced in serving that load
  - Transmission Lines & Transformers
    - 10 Year Transmission Expansion Plan
- Area Interchange of long-term firm commitments across the interface
- Generation needed to balance all of the above

SERTP Cumulative Summer Peak Load Forecast



Regional Transmission Expansion Plan

The projects described in this presentation represent the regional ten (10) year transmission expansion plan. The transmission expansion plan is periodically reviewed and may be revised due to changes in assumptions. This presentation does not represent a commitment to build for projects listed in the future.

SERTP

Regional Transmission Expansion Plans

Southeastern Regional TRANSMISSION PLANNING

AECI Balancing Authority Area

AECI Balancing Authority

Upcoming 2020 Generation Assumptions

* AECI has no generation assumptions expected to change throughout the ten year planning horizon for the 2020 SERTP Process.

AECI Balancing Authority Area

AECI Balancing Authority Area

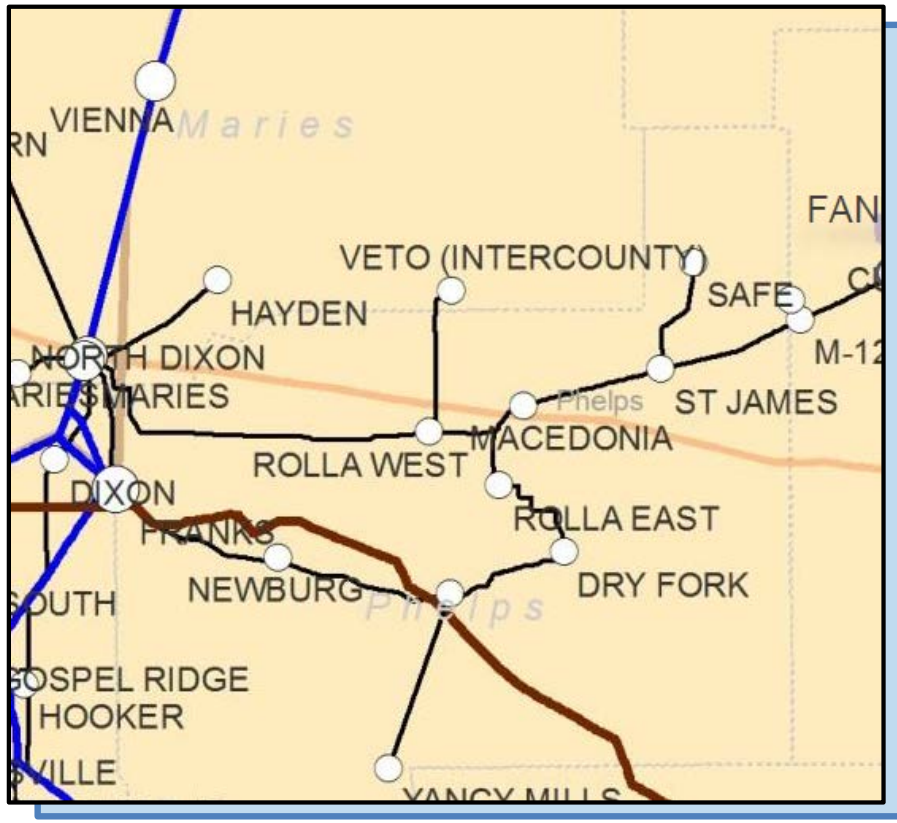
Preliminary Transmission Expansion Plan

AECI Balancing Authority Area

AECI – 1

- **2021**

Macedonia – Dillon 138 kV T.L. & Macedonia 138 kV Substation

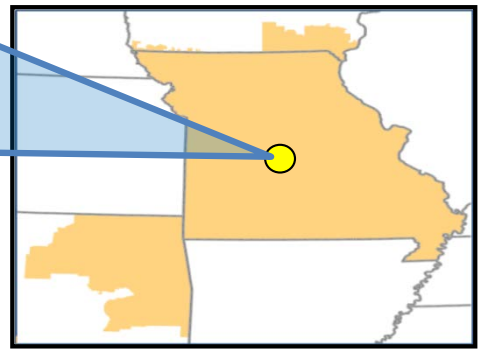


DESCRIPTION:

Construct approximately 1.1 miles of 138 kV transmission line from Macedonia to Dillon (Ameren) with 795 ACSR at 100°C and install a 56 MVA 138/69 kV transformer at Macedonia.

SUPPORTING STATEMENT:

The Maries – Rolla. West transmission line overloads under contingency and additional voltage support is needed in the Maries and Rolla areas under contingency



AECI Balancing Authority Area

AECI Balancing Authority

Upcoming 2021 Generation Assumptions

* AECI has no generation assumptions expected to change throughout the ten year planning horizon for the 2021 SERTP Process.

Duke Carolinas Balancing Authority Area

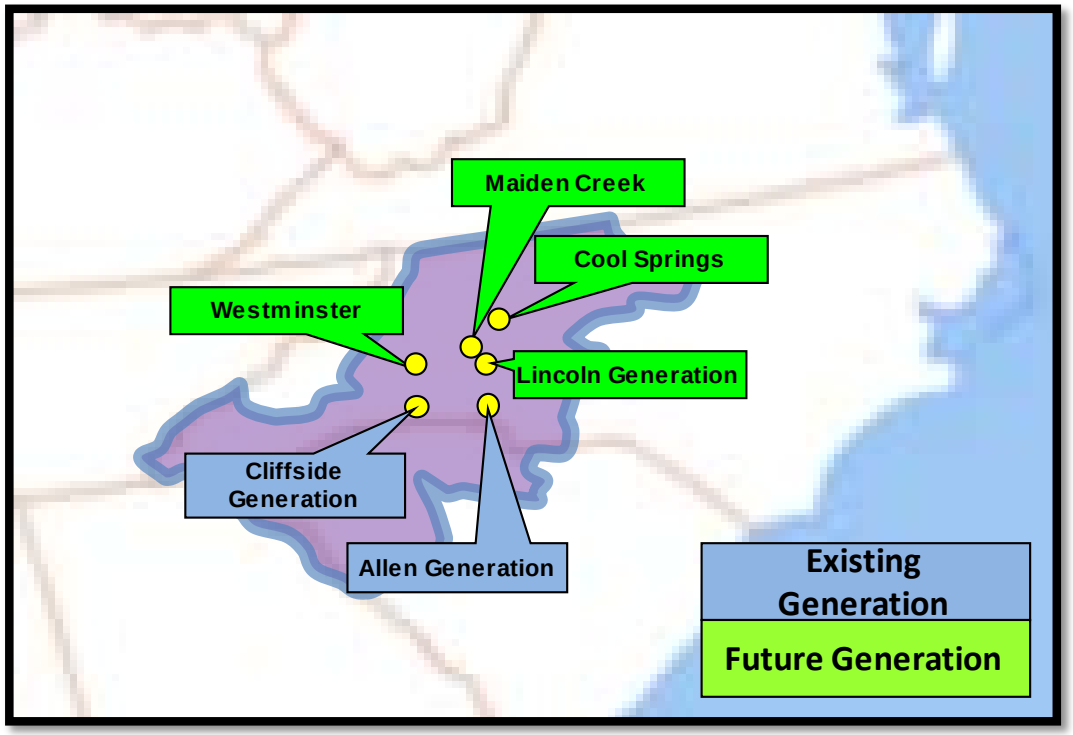
DUKE CAROLINAS Balancing Authority Area

2021 Generation Assumptions

Duke Carolinas Balancing Authority Area

DUKE CAROLINAS – Generation Assumptions

The following diagram depicts the location of generation assumptions <u>that change</u> throughout the ten year planning horizon for the 2020 SERTP Process.



Duke Carolinas Balancing Authority Area

DUKE CAROLINAS – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
ALLEN 1	COAL	174	174	174	174	0	--	--	--	--	--
ALLEN 2	COAL	172	172	172	172	0	--	--	--	--	--
ALLEN 3	COAL	271	271	271	271	0	--	--	--	--	--
ALLEN 4	COAL	274	274	274	274	274	274	274	0	--	--
ALLEN 5	COAL	290	290	290	290	290	290	290	0	--	--
Cliffside 5	COAL	566	566	566	566	566	566	566	566	566	566
Cool Springs	PV	--	80	80	80	80	80	80	80	80	80
Maiden Creek	PV	--	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
Westminster	PV	--	75	75	75	75	75	75	75	75	75
LINCOLN 17	GAS	--	--	--	402	402	402	402	402	402	402

Duke Carolinas Balancing Authority Area

DUKE 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	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
BROAD RIVER	850	850	850	850	850	850	850	850	850	850
CATAWBA	155	155	155	155	155	155	155	155	155	155
ROWAN	150	150	150	150	150	150	150	150	150	150

Duke Carolinas Balancing Authority Area

DUKE CAROLINAS Balancing Authority Area

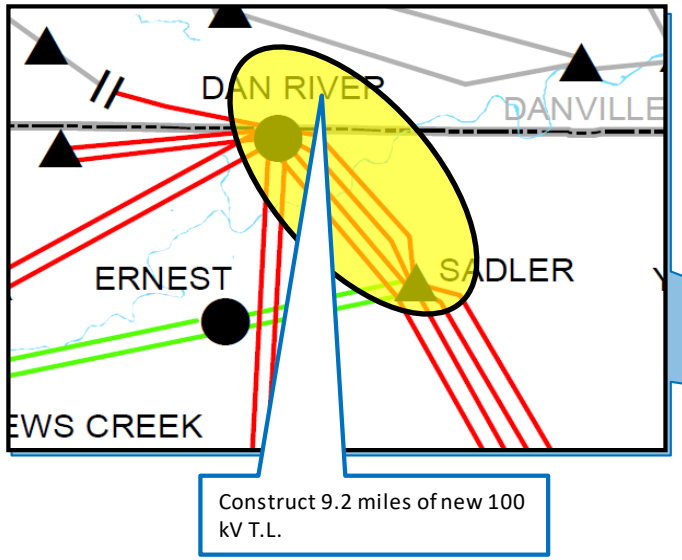
SERTP Regional Transmission Expansion Plan

Duke Carolinas Balancing Authority Area

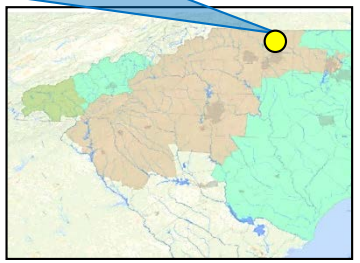
DUKE CAROLINAS – 1

- **2023**

SADLER TIE – DAN RIVER 100 KV TRANSMISSION LINE



- **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.

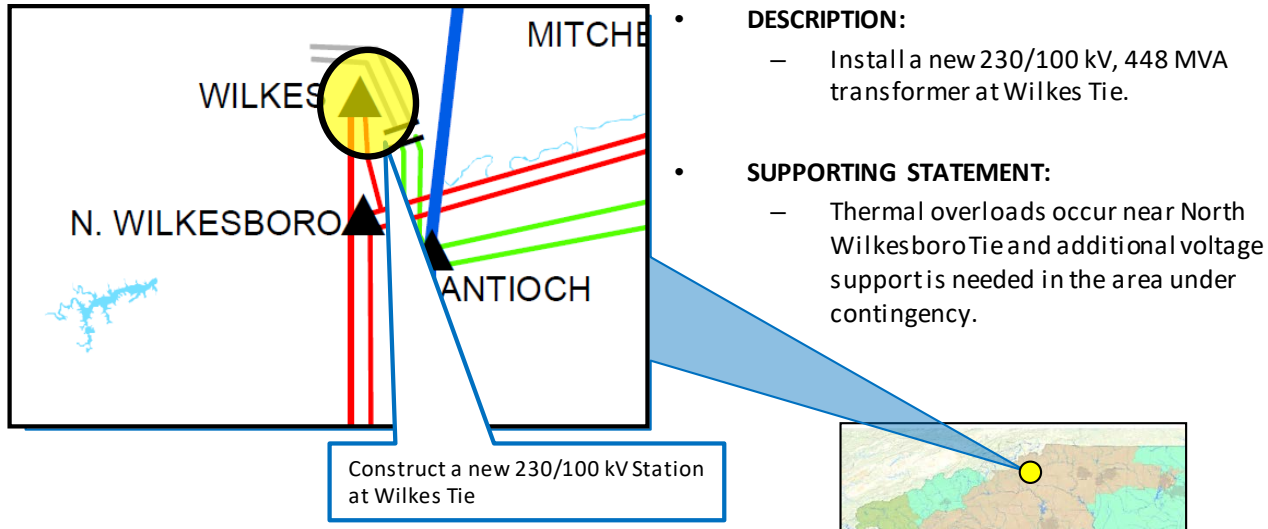


Duke Carolinas Balancing Authority Area

DUKE CAROLINAS – 2

- **2023**

WILKES TIE 230 KV SUBSTATION



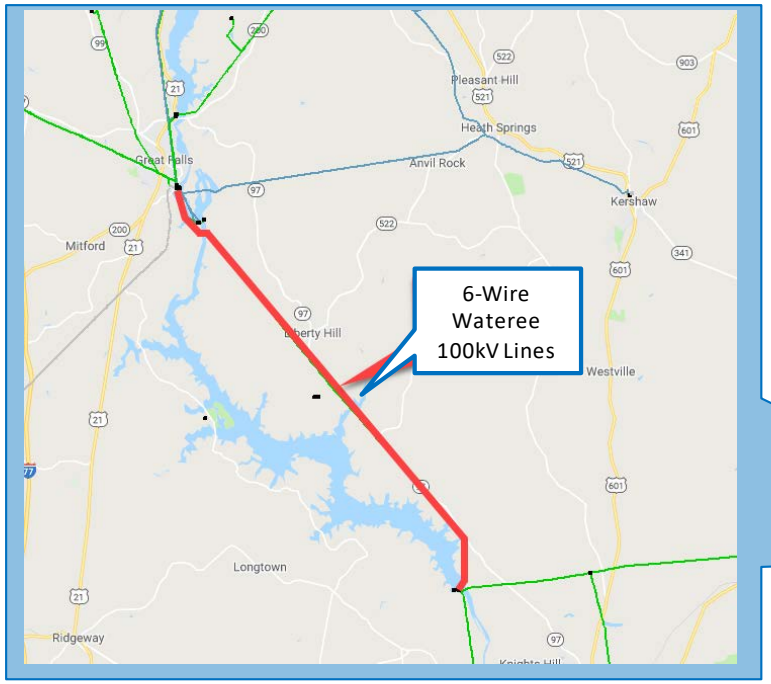
- **DESCRIPTION:**
  - Install a new 230/100 kV, 448 MVA transformer at Wilkes Tie.
- **SUPPORTING STATEMENT:**
  - Thermal overloads occur near North Wilkesboro Tie and additional voltage support is needed in the area under contingency.

Duke Carolinas Balancing Authority Area

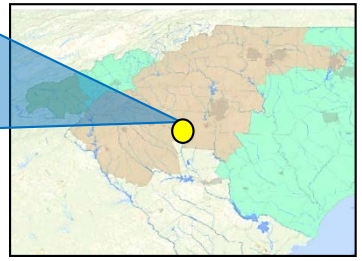
DUKE CAROLINAS - 3

- **2023**

WATEREE LINE 6-WIRE



- **DESCRIPTION:**
  - 6-Wire the double circuit Wateree Line
- **SUPPORTING STATEMENT:**
  - Thermal overloads may occur with the loss of a parallel Great Falls – Wateree 100kV line. Project done in conjunction with DEP's Wateree Transformer replacement project

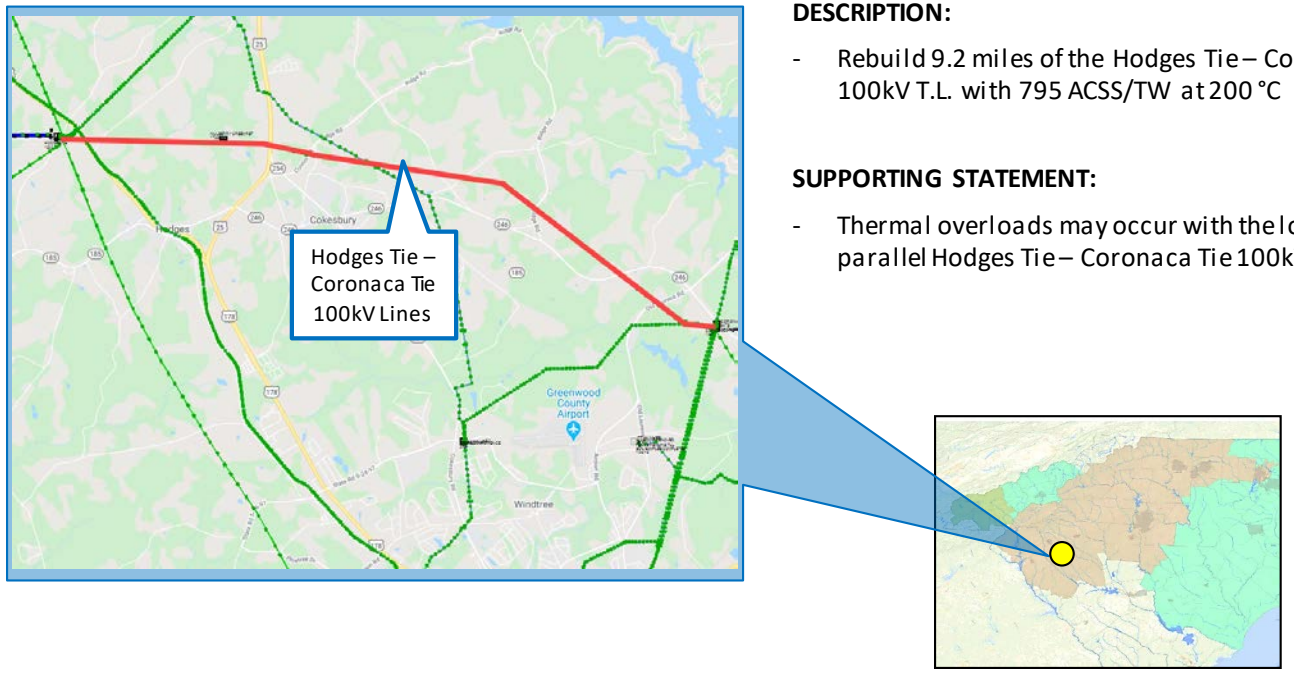


Duke Carolinas Balancing Authority Area

DUKE CAROLINAS - 4

- **2023**

HODGES TIE – CORONACA TIE 100KV TRANSMISSION LINE



DESCRIPTION:

- Rebuild 9.2 miles of the Hodges Tie – Coronaca Tie 100kV T.L. with 795 ACSS/TW at 200 °C

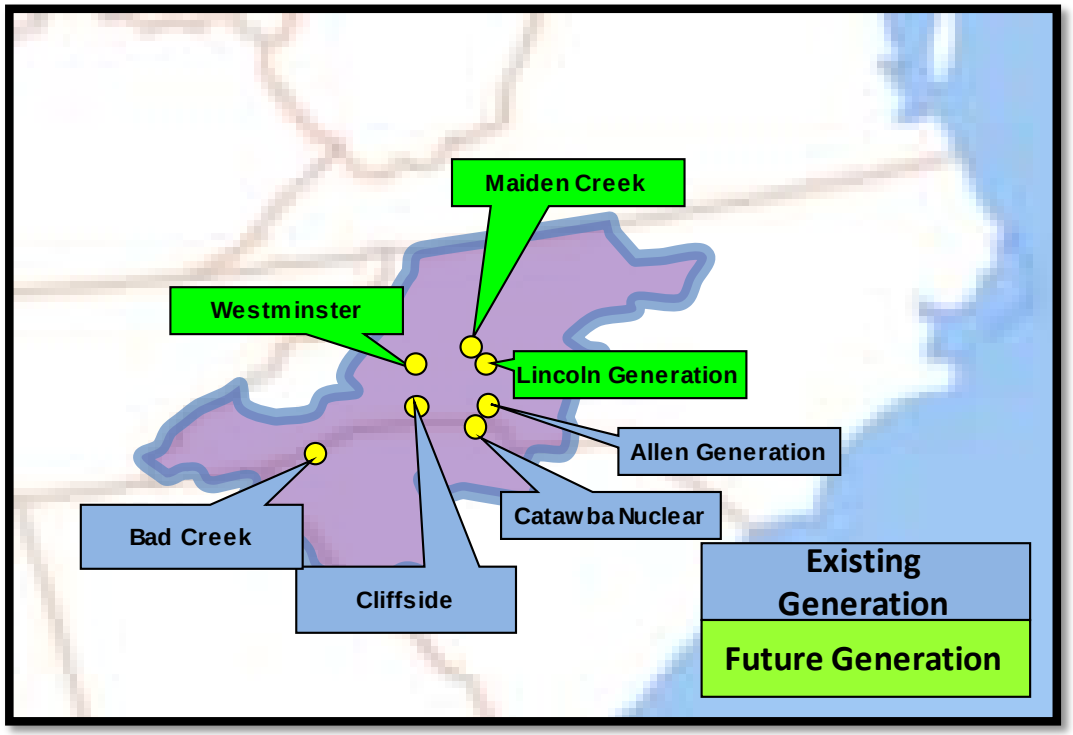
SUPPORTING STATEMENT:

- Thermal overloads may occur with the loss of a parallel Hodges Tie – Coronaca Tie 100kV line.

Duke Carolinas Balancing Authority Area

DUKE CAROLINAS 2021 – Generation Assumptions

The following diagram depicts the location of generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process.



Duke Carolinas Balancing Authority Area

DUKE CAROLINAS 2021 – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
ALLEN 1	COAL	174	174	174	174	0	--	--	--	--	--
ALLEN 2	COAL	172	172	172	172	0	--	--	--	--	--
ALLEN 3	COAL	271	271	271	271	0	--	--	--	--	--
ALLEN 4	COAL	274	274	274	274	274	274	274	0	--	--
ALLEN 5	COAL	290	290	290	290	290	290	290	0	--	--
Cliffside 5	COAL	566	566	566	566	566	566	566	566	566	566
Maiden Creek	PV	--	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3	69.3
Westminster	PV	--	75	75	75	75	75	75	75	75	75
LINCOLN 17	GAS	--	--	--	402	402	402	402	402	402	402
Bad Creek 1	Pumped Storage	420	420	420	420	420	420	420	420	420	420
Bad Creek 2	Pumped Storage	420	420	420	420	420	420	420	420	420	420
Bad Creek 3	Pumped Storage	340	420	420	420	420	420	420	420	420	420
Bad Creek 4	Pumped Storage	340	340	420	420	420	420	420	420	420	420
Catawba Unit 1	Nuclear	1188	1188	1188	1188	1188	1188	1188	1188	1188	1188
Catawba Unit 2	Nuclear	1139	1169	1169	1169	1169	1169	1169	1169	1169	1169

Duke Carolinas Balancing Authority Area

DUKE 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	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
BROAD RIVER	850	850	850	850	850	850	850	850	850	850
CATAWBA	155	155	155	155	155	155	155	155	155	155
ROWAN	150	150	150	150	150	150	150	150	150	150

DUKE PROGRESS EAST/WEST Balancing Authority Area

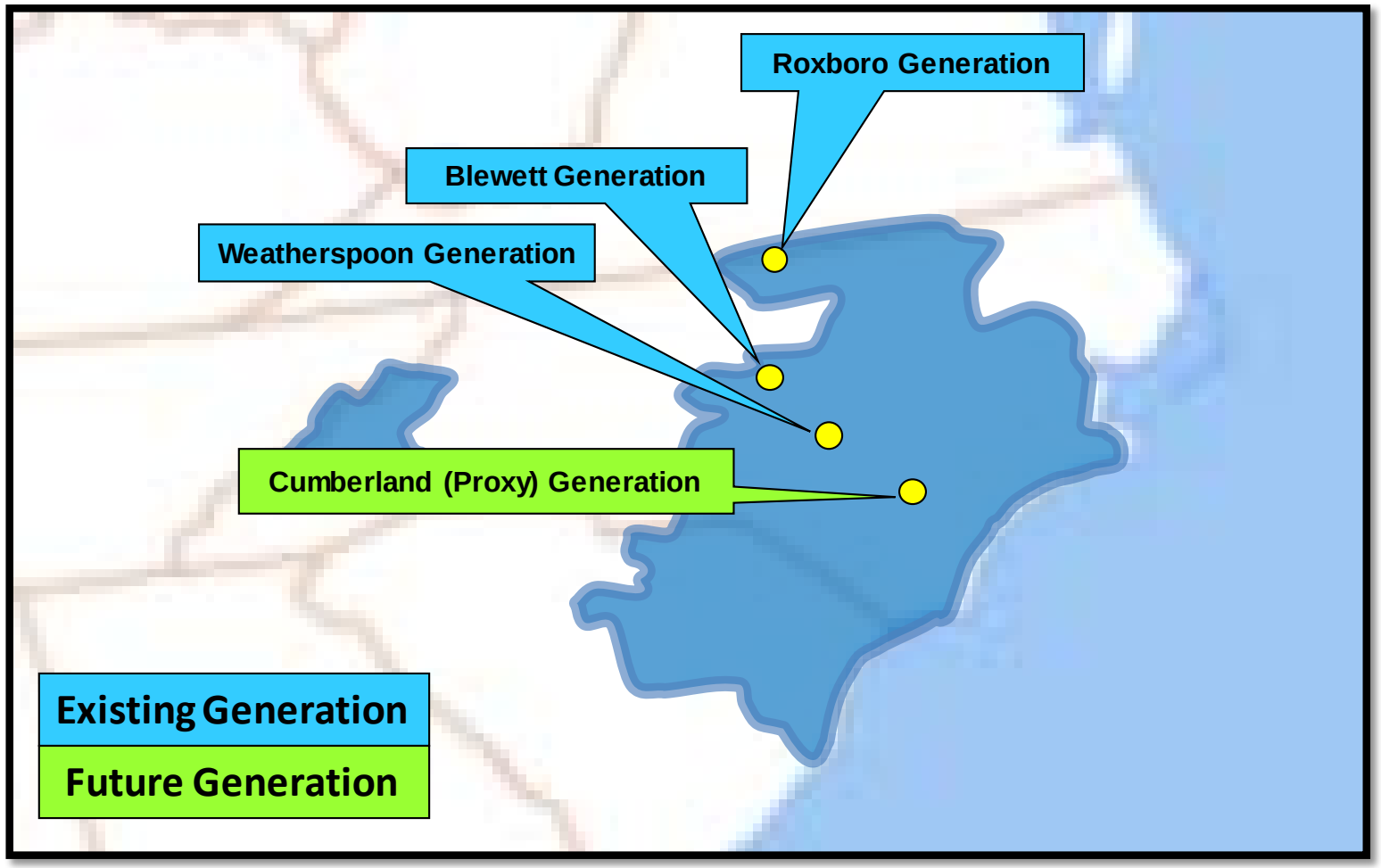
DUKE PROGRESS EAST/WEST Balancing Authority Areas

2021 Generation Assumptions

DUKE PROGRESS EAST/WEST Balancing Authority Area

DUKE PROGRESS – Generation Assumptions

The following diagram depicts the location of generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process.



DUKE PROGRESS – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
BLEWETT IC #1	13	13	13	13	0	--	--	--	--	--
BLEWETT IC #2	13	13	13	13	0	--	--	--	--	--
BLEWETT IC #3	13	13	13	13	0	--	--	--	--	--
BLEWETT IC #4	13	13	13	13	0	--	--	--	--	--
WEATHERSPOON IC #1	31	31	31	31	0	--	--	--	--	--
WEATHERSPOON IC #2	31	31	31	31	0	--	--	--	--	--
WEATHERSPOON IC #3	32	32	32	32	0	--	--	--	--	--
WEATHERSPOON IC #4	30	30	30	30	0	--	--	--	--	--
ROXBORO #1 COAL	379	379	379	379	379	379	379	379	0	--

DUKE PROGRESS EAST/WEST Balancing Authority Area

DUKE PROGRESS – Generation Assumptions (Cont.)

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
ROXBORO #2 COAL	668	668	668	668	668	668	668	668	0	--
CUMBERLAND (PROXY)	--	--	--	--	--	--	--	--	1200	1200

DUKE PROGRESS EAST/WEST Balancing Authority Area

DUKE 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	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
HAMLET #1	55	55	55	55	55	55	55	55	55	55
HAMLET #2	55	55	55	55	55	55	55	55	55	55
HAMLET #3	55	55	55	55	55	55	55	55	55	55

Southeastern Regional TRANSMISSION PLANNING

DUKE PROGRESS EAST Balancing Authority Area

DUKE PROGRESS EAST Balancing Authority

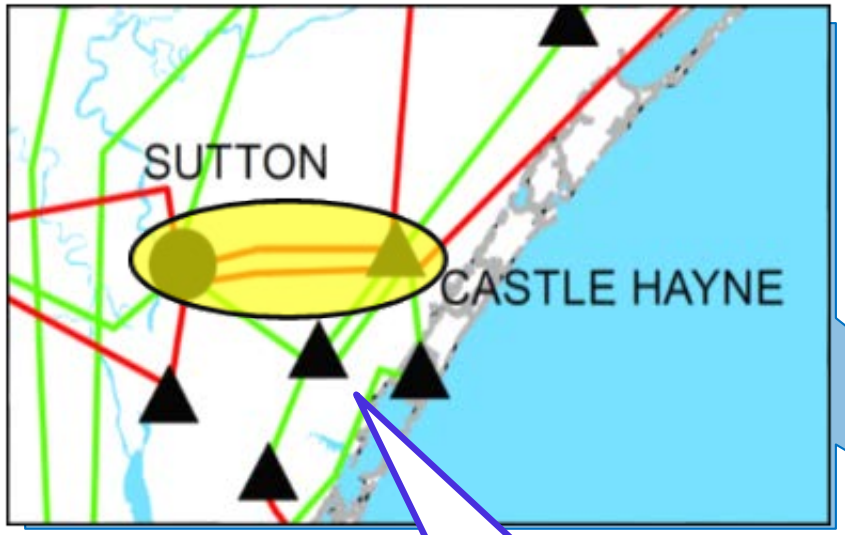
SERTP Regional Transmission Expansion Plan

DUKE PROGRESS EAST Balancing Authority Area

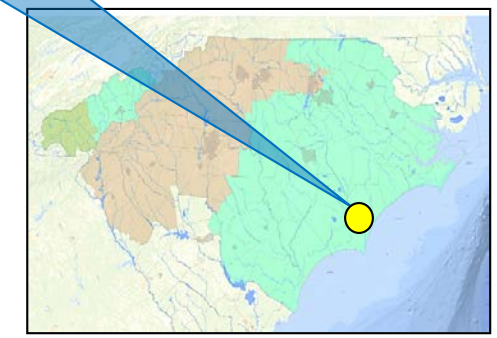
DUKE PROGRESS EAST – 1

- **2021**

SUTTON PLANT – CASTLE HAYNE 115 KV NORTH T.L.



- **DESCRIPTION:**
  - Rebuild approximately 8.0 miles of the Sutton Plant – Castle Hayne 115 kV North transmission line using 1272 ACSR rated for 239 MVA.
- **SUPPORTING STATEMENT:**
  - The Sutton Plant – Castle Hayne 115 kV North transmission line overloads under contingency.

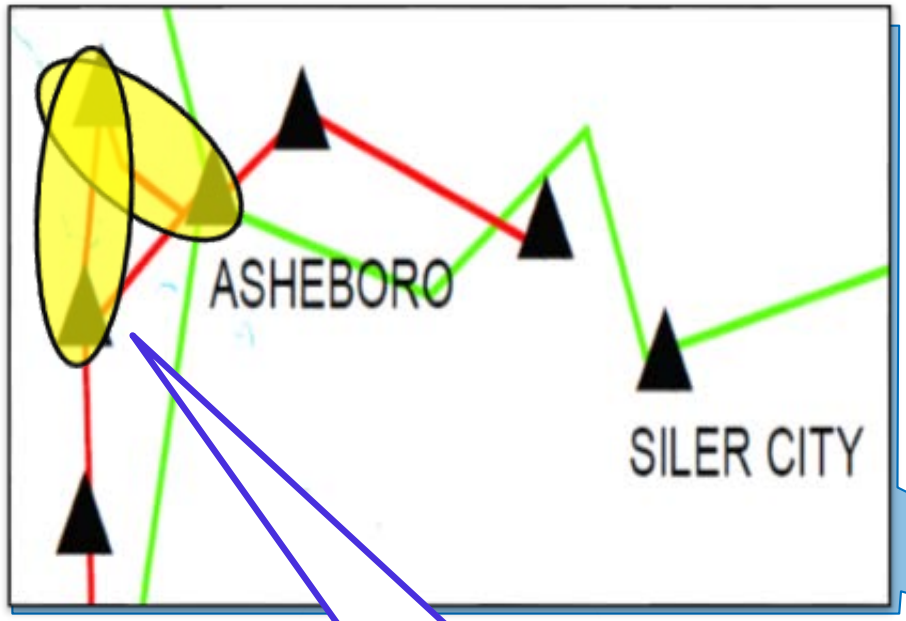


DUKE PROGRESS EAST Balancing Authority Area

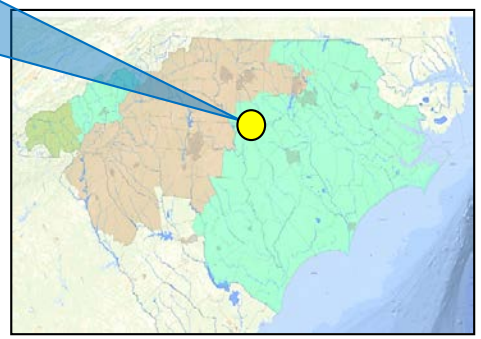
DUKE PROGRESS EAST – 2

- **2021**

ASHEBORO – ASHEBORO EAST (NORTH) 115 KV T.L.



- **DESCRIPTION:**
  - Rebuild approximately 6.5 miles of the Asheboro – Asheboro East (North) 115 kV transmission line using 3-1590 ACSR rated for 307 MVA. Replace disconnect switches at Asheboro 230 kV and both the breaker and the disconnect switches at Asheboro East 115 kV with equipment of at least 2000A capability.
- **SUPPORTING STATEMENT:**
  - The Asheboro – Asheboro East (North) 115 kV transmission line overloads under contingency.

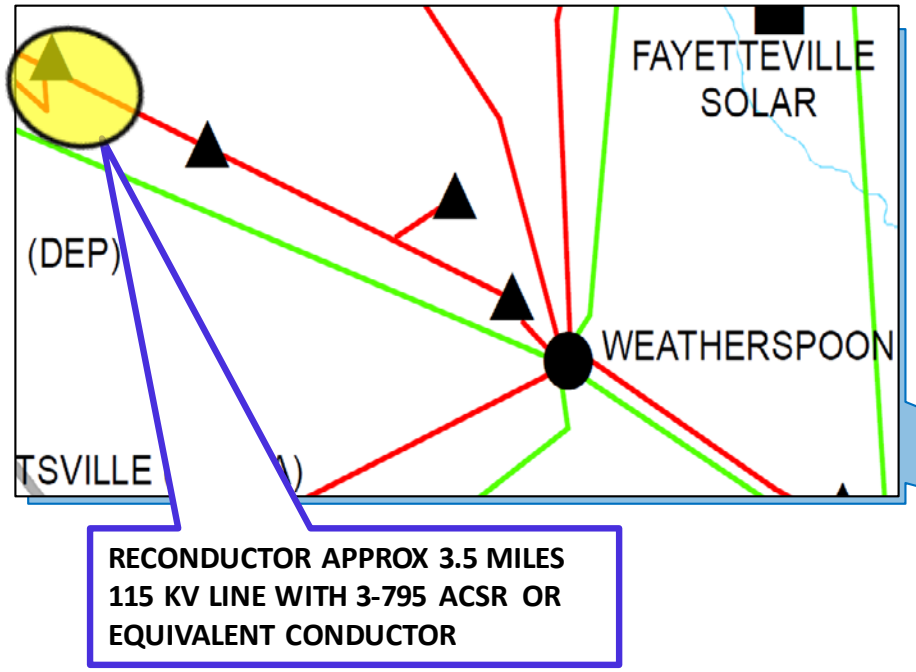


DUKE PROGRESS EAST Balancing Authority Area

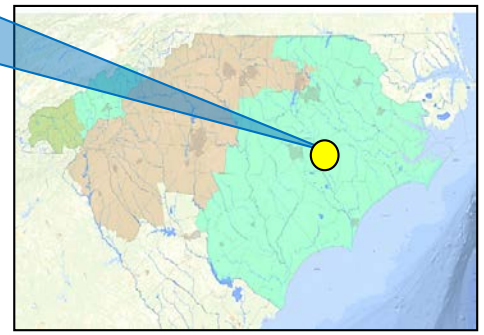
DUKE PROGRESS EAST – 3

- **2022**

IND 304440 – MAXTON 115 KV RECONDUCTOR



- **DESCRIPTION:**
  - Reconductor with 3-795 MCM ACSR or equivalent from IND 304440 to Maxton 115 kV substation approximately 3.5 miles. Replace existing 600A switches with 1200A switches.
- **SUPPORTING STATEMENT:**
  - The IND 304440-Maxton section of the Weatherspoon-IND 304440 115 kV transmission line overloads under contingency.

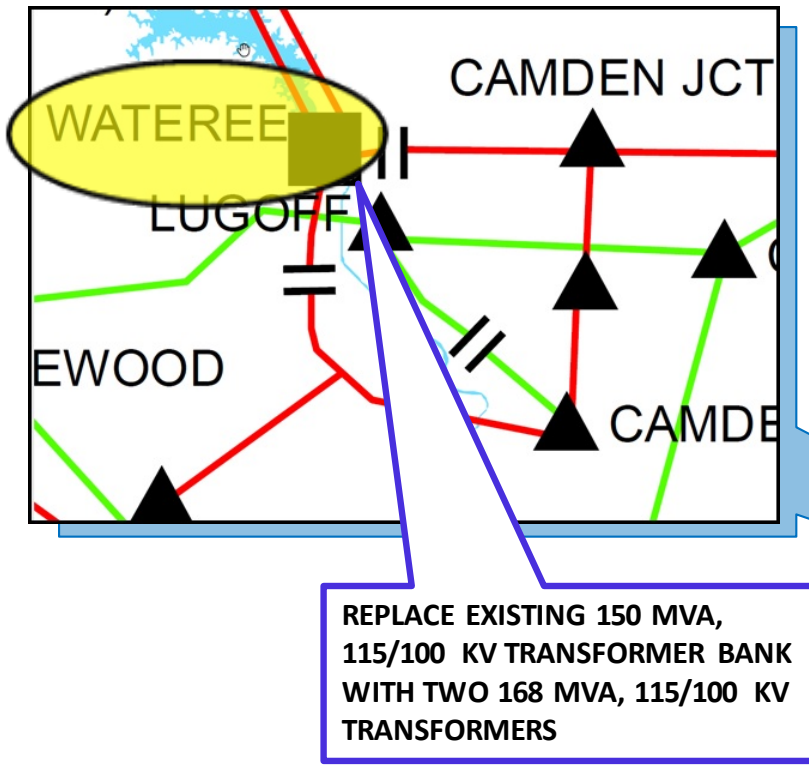


DUKE PROGRESS EAST Balancing Authority Area

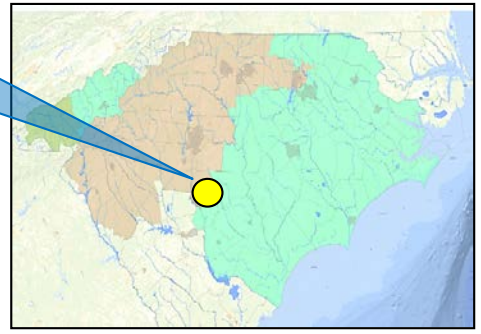
DUKE PROGRESS EAST – 4

- **2023**

WATEREE 115 KV PLANT – REPLACE 115/100 KV TRANSFORMERS



- **DESCRIPTION:**
  - Replace existing 150 MVA, 115/100 kV transformer bank with two 168 MVA, 115/100 kV transformers. Project to be done in conjunction with DEC's Wateree Line 6-wire project.
- **SUPPORTING STATEMENT:**
  - The existing Wateree transformer bank overloads under contingency.

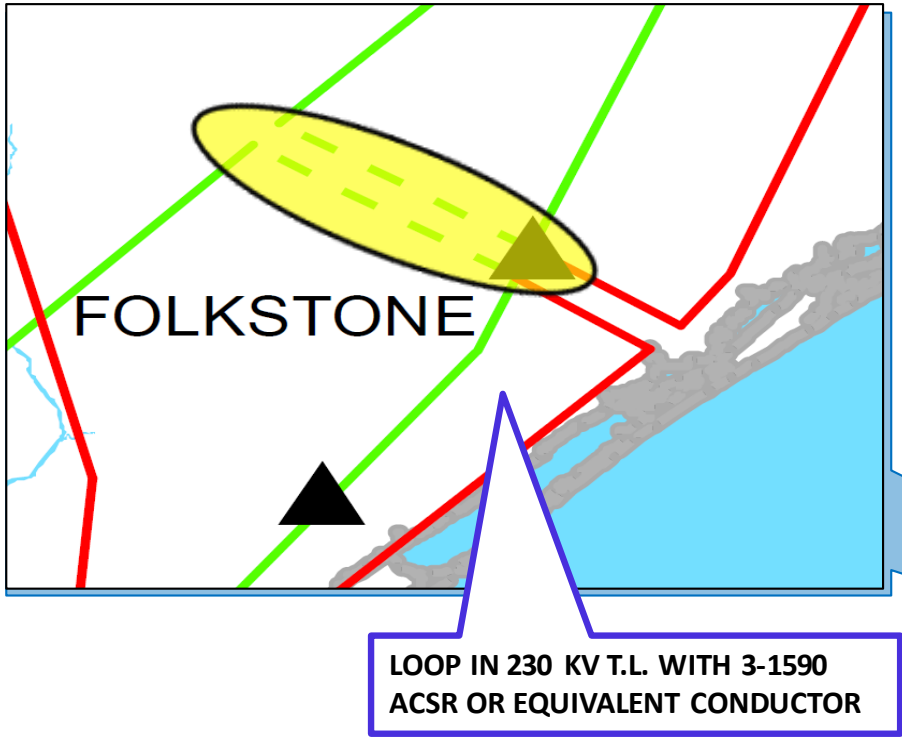


DUKE PROGRESS EAST Balancing Authority Area

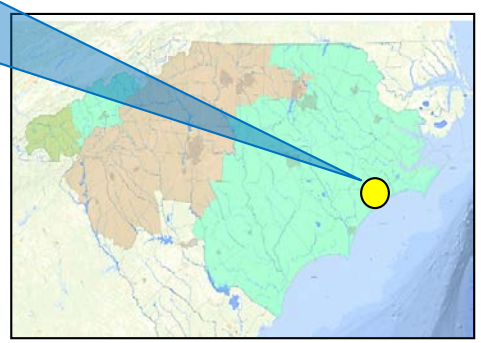
DUKE PROGRESS EAST – 5

- **2024**

BRUNSWICK #1 – JACKSONVILLE 230 KV T.L.



- **DESCRIPTION:**
  - Loop existing Brunswick Plant Unit 1 – Jacksonville 230 kV transmission line into the Folkstone 230 kV Substation. Also, convert the Folkstone 230 kV bus configuration to breaker-and-one-half by installing three (3) new 230 kV breakers.
- **SUPPORTING STATEMENT:**
  - The Castle Hayne – Folkstone 115 kV transmission line overloads under contingency.

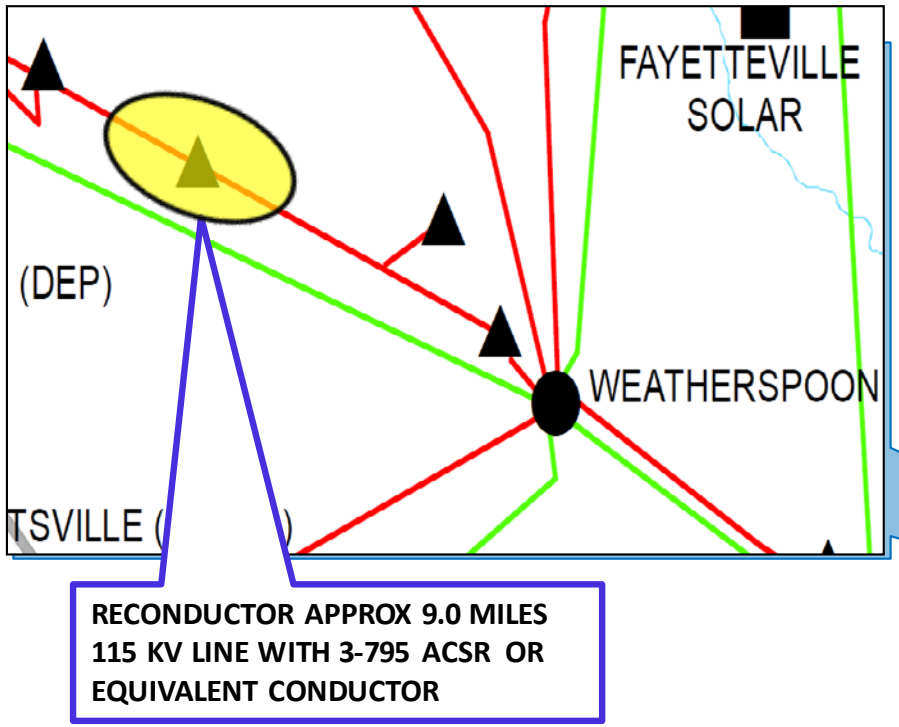


DUKE PROGRESS EAST Balancing Authority Area

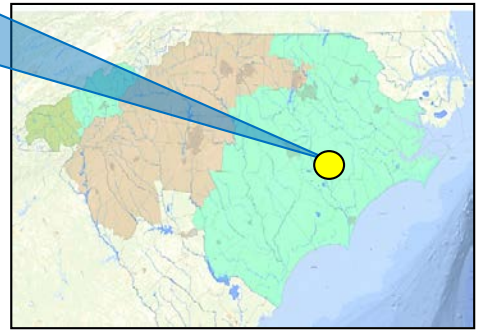
DUKE PROGRESS EAST – 6

- **2026**

WSPN – IND 304440 115 KV T.L.



- **DESCRIPTION:**
  - Reconductor approximately 9.0 miles from Maxton to Pembroke 115 kV substation with 3-795 MCM ACSR or equivalent. Replace existing 600A switch with 1200A switch.
- **SUPPORTING STATEMENT:**
  - The Maxton-Pembroke section of the Weatherspoon-IND 304440 115 kV transmission line overloads under contingency.

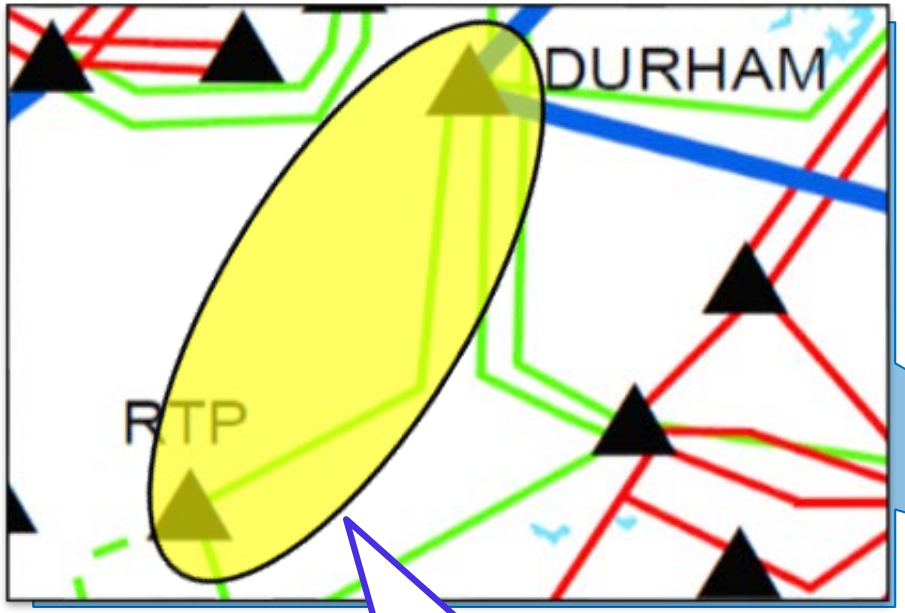


DUKE PROGRESS EAST Balancing Authority Area

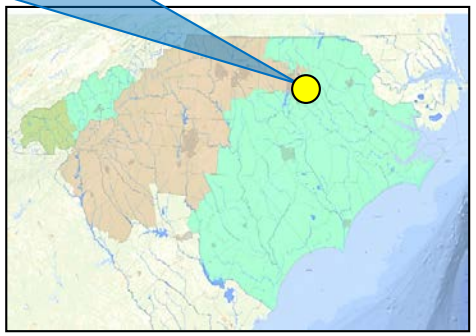
DUKE PROGRESS EAST – 7

- **2027**

DURHAM – RTP 230 KV T.L.



- **DESCRIPTION:**
  - Reconductor approximately 10.0 miles of the Durham – RTP 230 kV transmission line with bundled 6-1590 ACSR rated for 1195 MVA.
- **SUPPORTING STATEMENT:**
  - The Durham – RTP 230 kV transmission line overloads under contingency.



DUKE PROGRESS WEST Balancing Authority Area

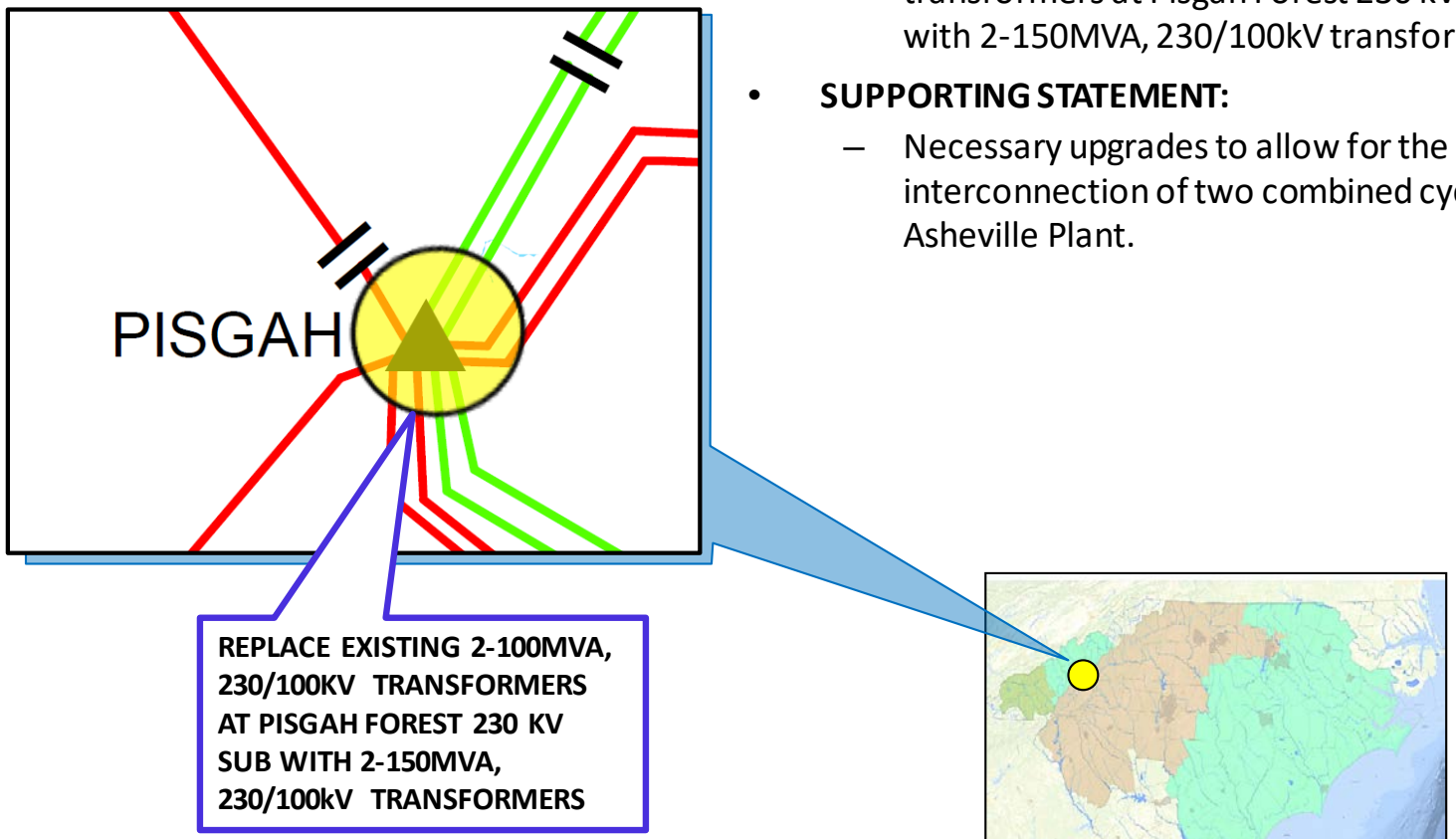
DUKE PROGRESS WEST Balancing Authority Area

SERTP Regional Transmission Expansion Plan

DUKE PROGRESS WEST – 1

- **2021**

PISGAH FOREST 230KV SUBSTATION

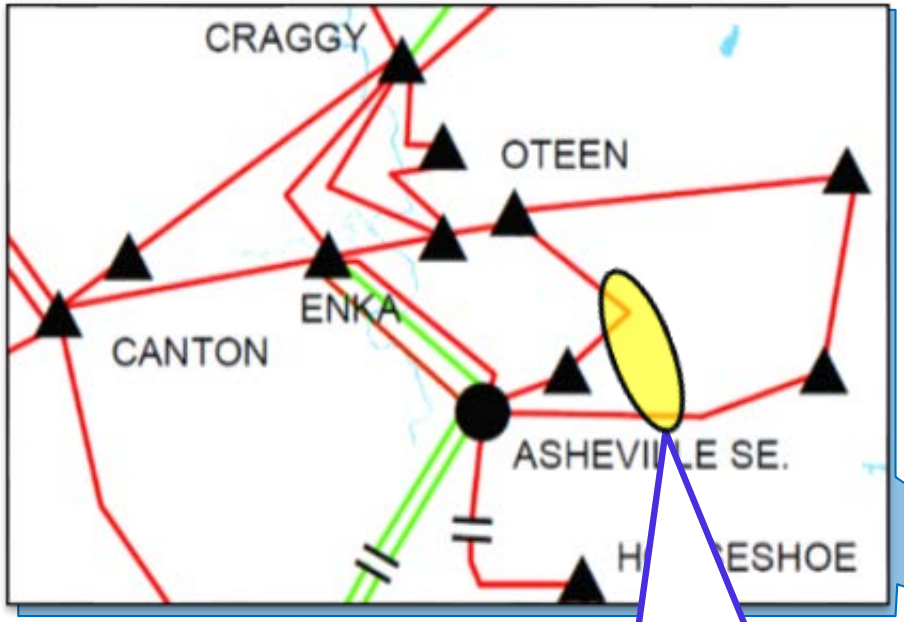


- **DESCRIPTION:**
  - Replace existing 2-100MVA, 230/100kV transformers at Pisgah Forest 230 kV Substation with 2-150MVA, 230/100kV transformers.
- **SUPPORTING STATEMENT:**
  - Necessary upgrades to allow for the interconnection of two combined cycle units at Asheville Plant.

DUKE PROGRESS WEST – 2

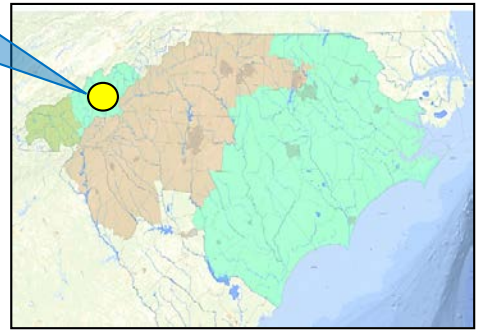
- **2022**

ASHEVILLE PLANT – OTEEN WEST 115 KV T.L., BALDWIN TAP



CONSTRUCT 2.2 MILES OF 115 KV TRANSMISSION LINE WITH 795 ACSR. RECONNECT THE BALDWIN 115 KV SUBSTATION.

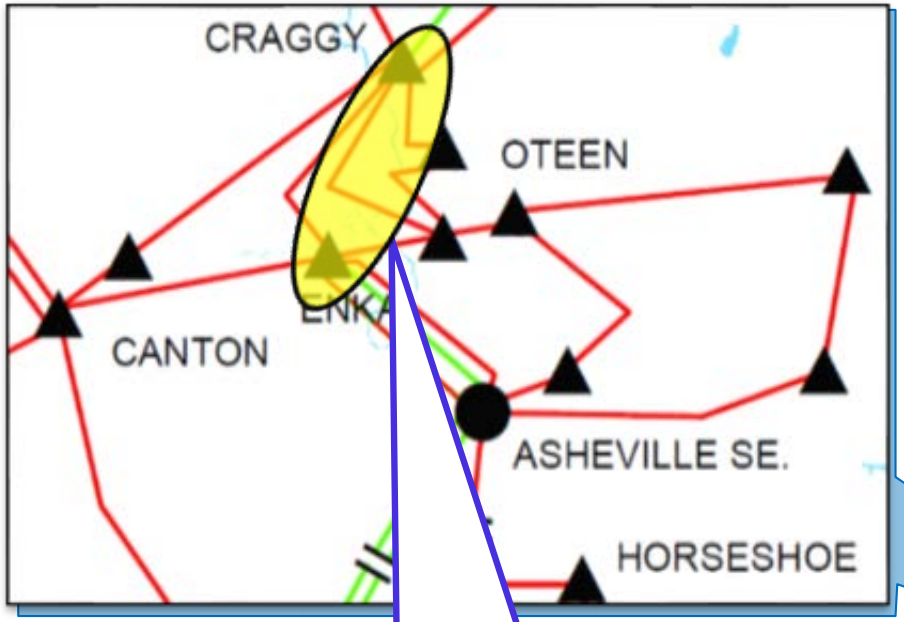
- **DESCRIPTION:**
  - Construct approximately 2.2 miles of new 115 kV transmission line from the Asheville Plant – Oteen West 115 kV transmission line to the Asheville Plant – Oteen East 115 kV transmission line with 795 ACSR. The Baldwin 115 kV substation will be reconnected to this new tap line.
- **SUPPORTING STATEMENT:**
  - Additional voltage support is needed in the Baldwin area.



DUKE PROGRESS WEST – 3

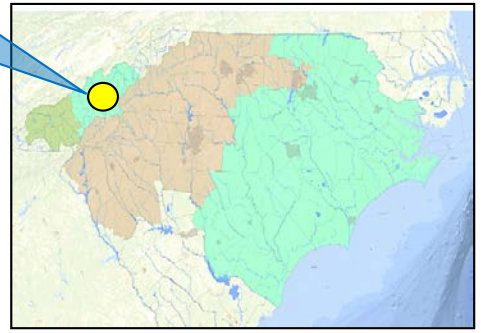
- **2025**

CRAGGY-ENKA 230 KV T.L., CONSTRUCT



- **DESCRIPTION:**
  - Construct approximately 10.0 miles of new 230 kV transmission line from the Craggy 230 kV substation to the Enka 230 kV substation with 3-954 ACSS-TW or equivalent conductor rated for 710 MVA.
- **SUPPORTING STATEMENT:**
  - The Enka–West Asheville 115 kV line overloads under contingency.

CONSTRUCT APPROXIMATELY 10.0 MILES OF 230 KV TRANSMISSION LINE FROM THE CRAGGY 230 KV SUB TO THE ENKA 230 KV SUB WITH 3-954 ACSS-TW OR EQUIVALENT CONDUCTOR RATED FOR 710 MVA.



DUKE PROGRESS EAST/WEST Balancing Authority Area

DUKE PROGRESS EAST/WEST Balancing Authority Areas

Upcoming 2021 Generation Assumptions

* Duke Progress East/West has no generation assumptions expected to change throughout the ten year planning horizon for the 2020 SERTP Process.

GULF POWER Balancing Authority Area

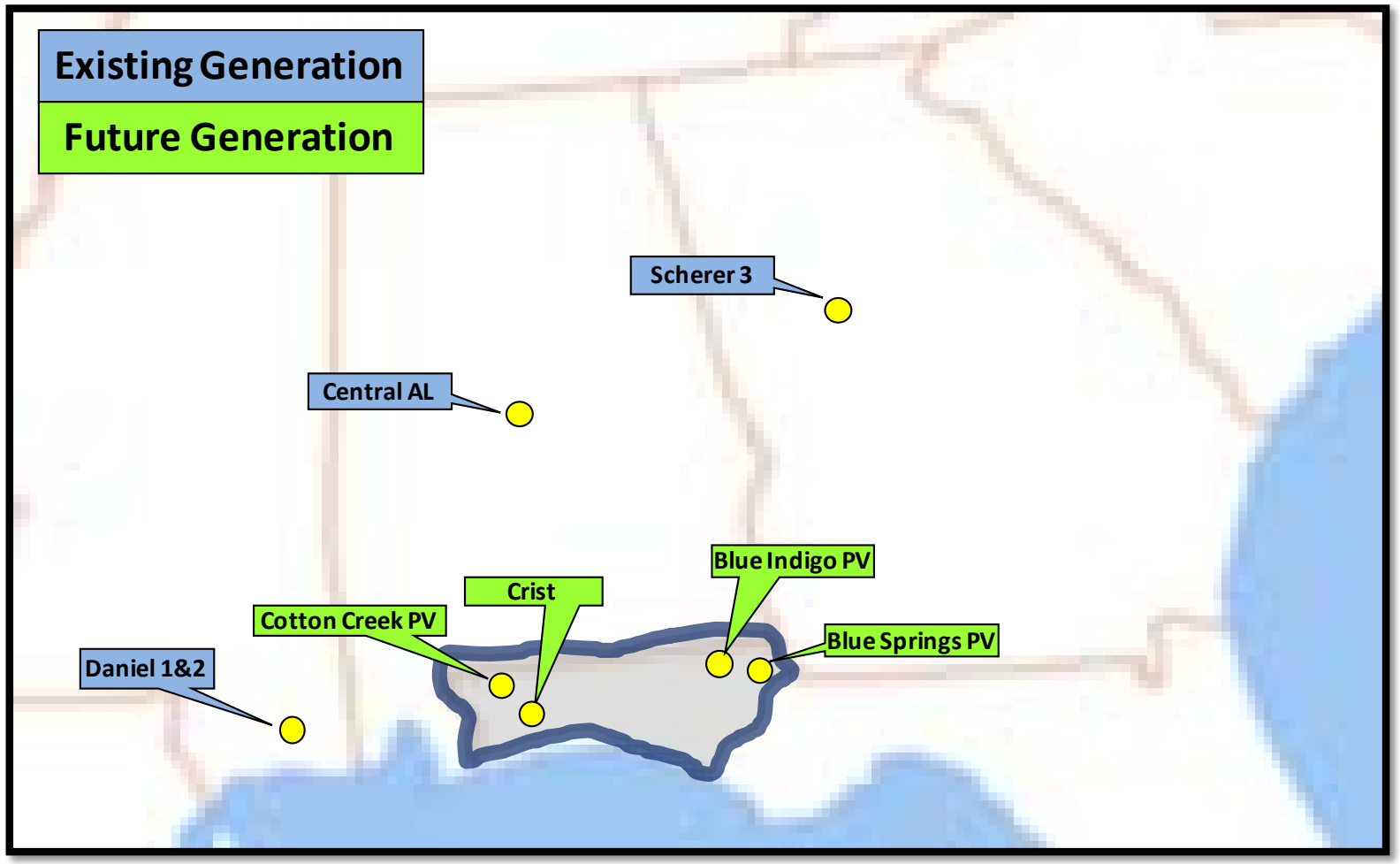
GULF POWER Balancing Authority Area

2020 Generation Assumptions

GULF POWER Balancing Authority Area

GULF POWER – Generation Assumptions 2021

The following diagram depicts the location of generation assumptions that change throughout the ten year planning horizon for the 2019 SERTP Process.



GULF POWER – Generation Assumptions

The following table depicts future generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021[1]	2022	2023	2024	2025	2026	2027	2028	2029	2030
CRIST	Gas	924	1862	1862	1862	1862	1862	1862	1862	1862	1862
BLUE INDIGO PV	Solar	75	75	75	75	75	75	75	75	75	75
COTTON CREEK PV	Solar	--	75	75	75	75	75	75	75	75	75
BLUE SPRING PV	Solar	--	75	75	75	75	75	75	75	75	75

1) Gulf Power is currently in the SBAA, plans to leave the SBAA in December 2021 are in progress but subject to change

GULF POWER Balancing Authority Area

GULF POWER – Generation Assumptions (Delivery Service)

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

SITE	2021[1]	2022	2023	2024	2025	2026	2027	2028	2029	2030
DANIEL	500	500	500	500	500	500	500	500	500	500
SCHERER	220	220	220	220	220	220	220	220	220	220
CENTRAL ALABAMA	885	885	--	--	--	--	--	--	--	--

1) Gulf Power is currently in the SBAA, plans to leave the SBAA in December 2021 are in progress but subject to change

GULF POWER Balancing Authority Area

GULF POWER Balancing Authority Area

SERTP Regional Transmission Expansion Plan

GULF POWER Balancing Authority Area

GULF - 1

- **2021**

RAVEN-SINAI CEMETARY 161kV TRANSMISSION LINE PROJECT

PROJECT DESCRIPTION:

1. Build a new 161kV line of approximately 176 miles rated at 3,210 Amps (895 MVA) from Raven (FPL) to Sinai Cemetery (GULF) substations.
2. Add a 230/161kV transformer at Raven and Sinai substations.

SUPPORTING STATEMENT:

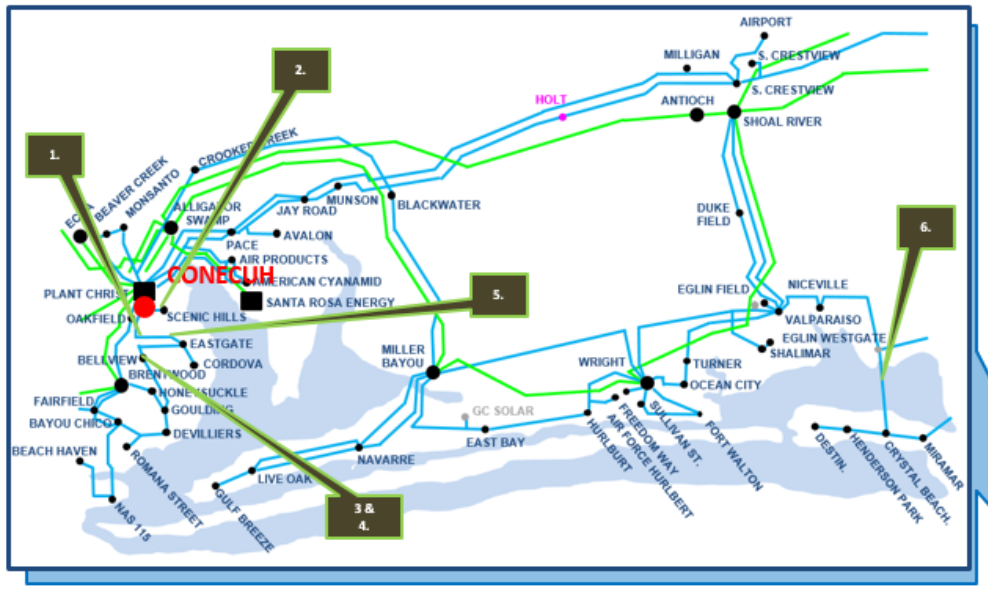
- This project will help meet future load growth and continue to improve reliability in a low cost manner for Gulf Power's customers by implementing a direct transmission connection between GULF and FPL.

GULF POWER Balancing Authority Area

GULF - 2

- **2021**

CRIST GENERATION EXPANSION PROJECT



PROJECT DESCRIPTION:

- Construct new 230kV Crist CT switchyard (Conecuh) to connect 4-235MW CTs. Loop existing Crist-Alligator Swamp #2-230kV and Crist-Bellview 230kV lines into new Crist CT switchyard.

Transmission upgrades:

1. Brentwood-Crist 230kV (1928A, 768MVA)(7.6miles)
2. Crist-Scenic Hills 115kV #1 (1800A, 359MVA)(2.9miles)
3. Bellview-Crist 230kV (1928A, 768MVA)(8.9miles)
4. Bellview 230/115kV Transformer (increase to 500MVA)
5. Eastgate-Scenic Hills 115kV (1005A, 200MVA)(4.8miles)
6. Crystal Beach-Bluewater 115kV 7-minutes Emergency Rating (1110A, 221MVA)
7. 1-55MVAR, 230kV cap bank at Laguna Beach

SUPPORTING STATEMENT:

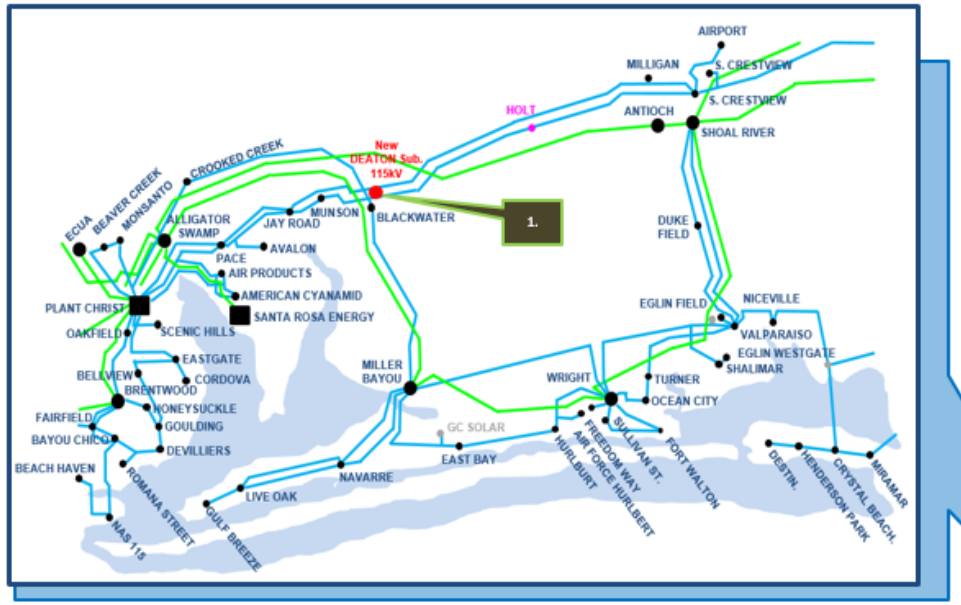
- Revised resource integration in Gulf Power Area.

GULF POWER Balancing Authority Area

GULF - 3

- **2022**

DEATON INJECTION



PROJECT DESCRIPTION:

1. Build a new 115kV substation (Deaton) looping-in the existing Crist-South Crestview #1 & #2-115kV lines.

SUPPORTING STATEMENT:

- This project eliminates several overloads under a number of contingency scenarios. This project also provides additional operational and maintenance flexibility which then increases reliability.

LEGEND

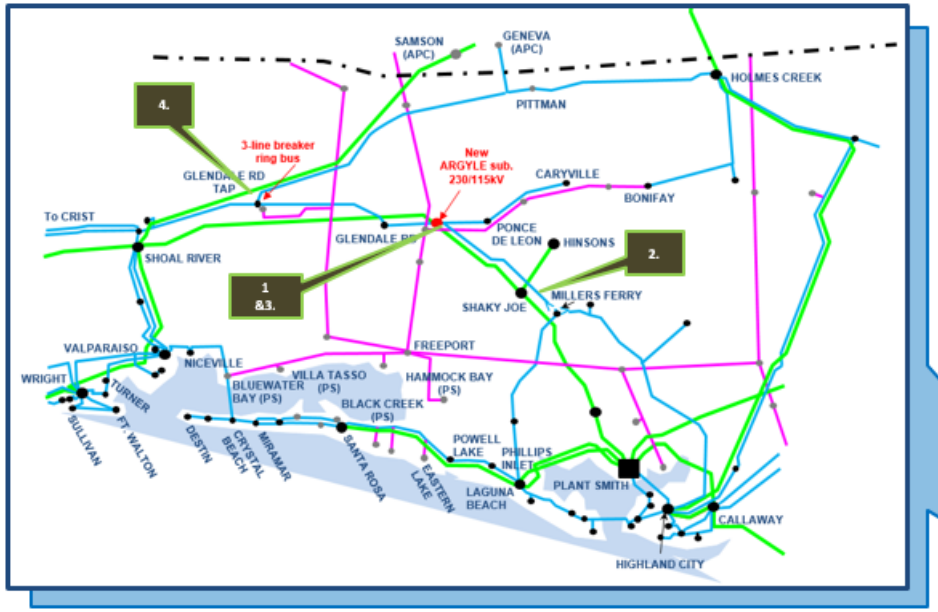
- 115 kV
- 230 kV
- PowerSouth

GULF POWER Balancing Authority Area

GULF - 4

- **2023**

ARGYLE INJECTION



PROJECT DESCRIPTION:

1. Build a new 230/115kV substation (Argyle) looped-in on the existing Shoal River-Shaky Joe transmission line and Glendale Road-Caryville Tap 115kV line section.
2. Extend Caryville Tap-Millers Ferry 115kV line section to Argyle creating the new Argyle-Millers Ferry 115kV line.
3. Install a 230/115kV, 500 MVA autotransformer at Argyle substation.
4. Build a 3-breaker ring bus substation at Glendale Tap site.

SUPPORTING STATEMENT:

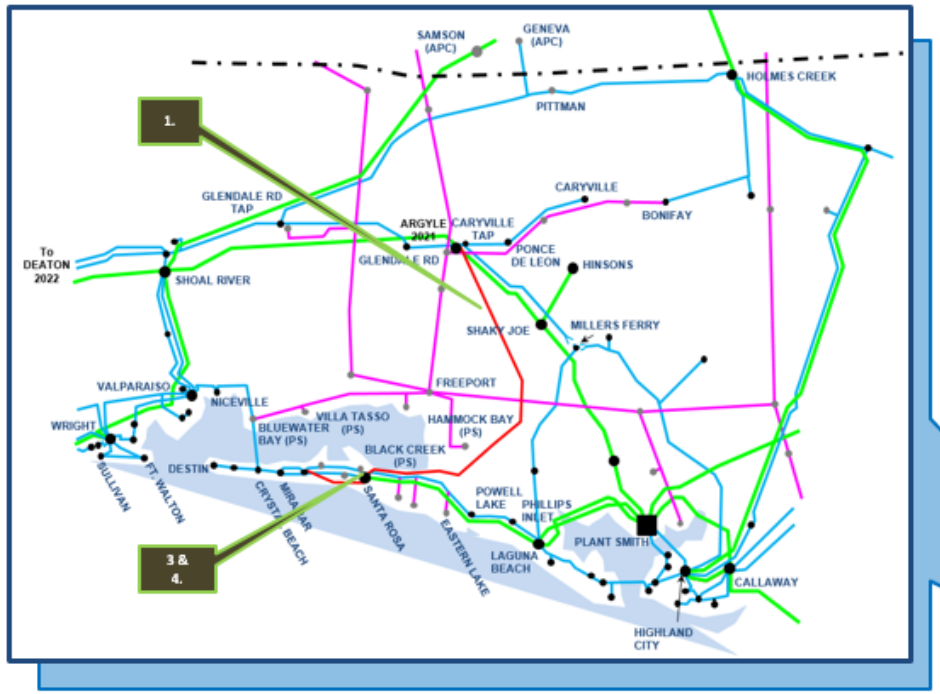
- This project eliminates several overloads under a number of contingency scenarios. This project also provides additional operational and maintenance flexibility which then increases reliability.

GULF POWER Balancing Authority Area

GULF - 5

- **2023**

ARGYLE – SANTA ROSA 115 KV TRANSMISSION LINE

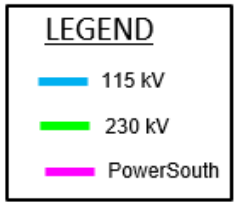


PROJECT DESCRIPTION:

1. Construct a new 115kV line of approximately 35 miles rated at 1495 Amps from new Argyle substation to Santa Rosa substation.
2. Build a new 115kV line of approximately 7.4 miles from Santa Rosa to Sandestin substation.
3. Build a 3-breaker ring bus substation at Sandestin site.

SUPPORTING STATEMENT:

- This project eliminates several overloads under a number of contingency scenarios. This project also provides additional operational and maintenance flexibility which then increases reliability.

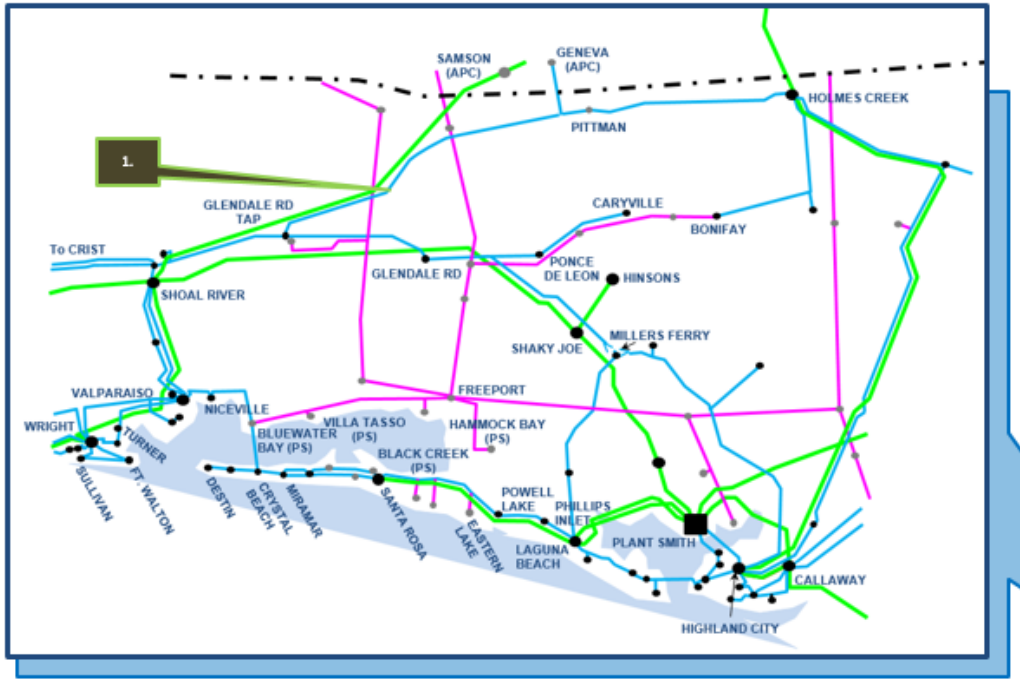


GULF POWER Balancing Authority Area

GULF - 6

- **2024**

HOLMES CREEK – SOUTH CRESTVIEW 115 KV TRANSMISSION LINE

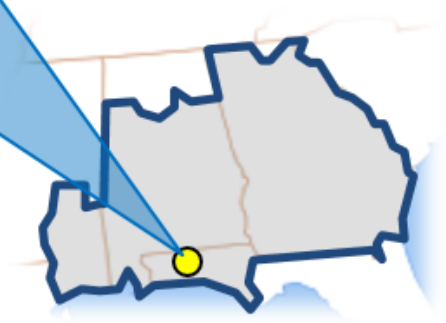


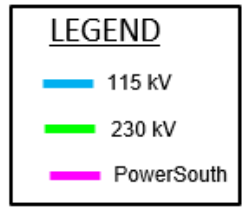
PROJECT DESCRIPTION:

1. Rebuild approximately 54.4 miles of 115 kV transmission line between Holmes Creek and Glendale Road tap point with 795 ACSR at 100°C.

SUPPORTING STATEMENT:

- This project eliminates high loadings under contingency scenarios. This project also provides additional operational and maintenance flexibility which then increases reliability.



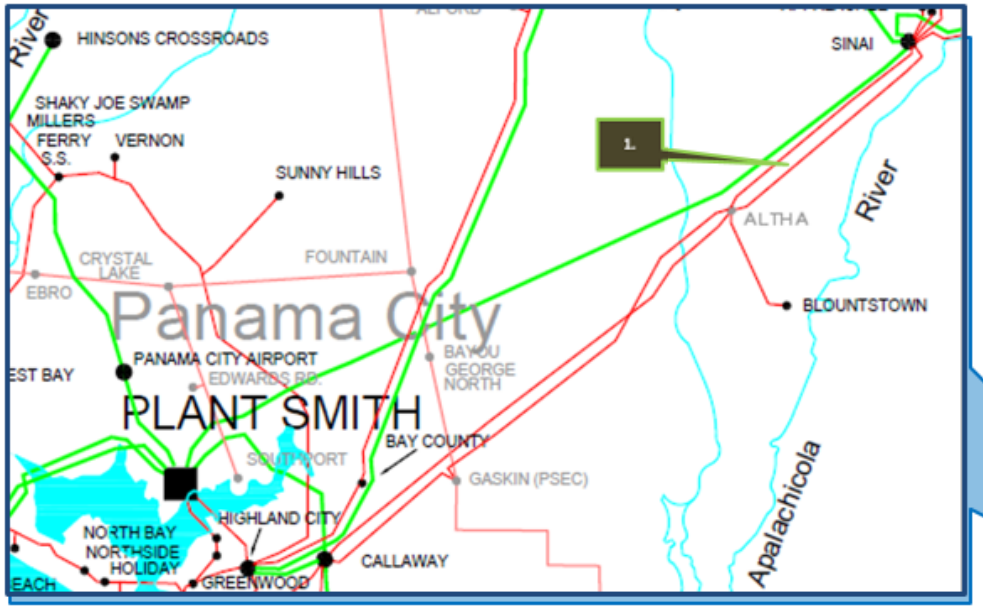


GULF POWER Balancing Authority Area

GULF - 7

- **2027**

SINAI-GASKIN 115 KV TRANSMISSION LINE

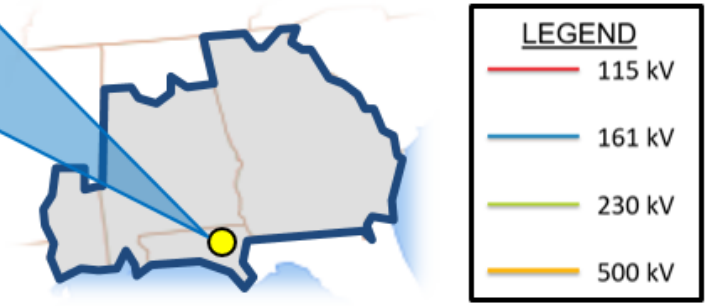


PROJECT DESCRIPTION:

1. Rebuild/upgrade approximately 17.3 miles of 115 kV transmission line between Sinai-Altha (PS) for a minimum of 567Amps (113MVA).

SUPPORTING STATEMENT:

- This project eliminates high loadings under contingency scenarios. This project also provides additional operational and maintenance flexibility which then increases reliability.



GULF POWER Balancing Authority Area

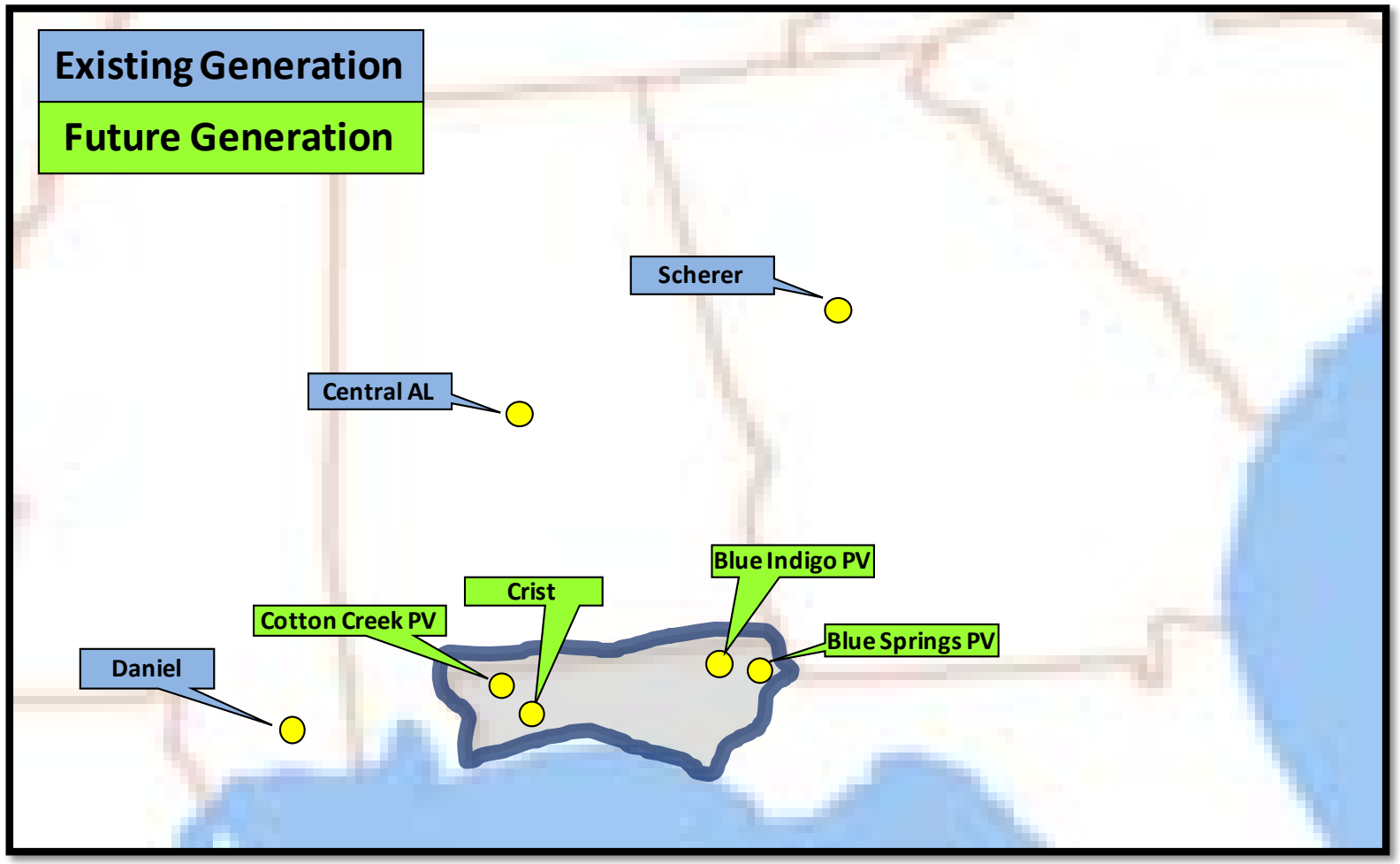
GULF POWER Balancing Authority Areas

Upcoming 2021 Generation Assumptions

GULF POWER Balancing Authority Area

GULF POWER – Generation Assumptions 2022

The following diagram depicts the location of generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process.



GULF POWER Balancing Authority Area

GULF POWER – Generation Assumptions

The following table depicts future generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021[1]	2022	2023	2024	2025	2026	2027	2028	2029	2030
CRIST	Gas	924	1862	1862	1862	1862	1862	1862	1862	1862	1862
BLUE INDIGO PV	Solar	75	75	75	75	75	75	75	75	75	75
COTTON CREEK PV	Solar	75	75	75	75	75	75	75	75	75	75
BLUE SPRING PV	Solar	75	75	75	75	75	75	75	75	75	75

1) Gulf Power is currently in the SBAA but has preliminary plans to leave the SBAA in December 2021

GULF POWER Balancing Authority Area

GULF POWER – Generation Assumptions (Delivery Service)

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

SITE	2021[1]	2022	2023	2024	2025	2026	2027	2028	2029	2030
DANIEL	500	500	500	500	500	500	500	500	500	500
SCHERER	220	220	220	220	220	220	220	220	220	220
CENTRAL ALABAMA	885	885	--	--	--	--	--	--	--	--

1) Gulf Power is currently in the SBAA but has preliminary plans to leave the SBAA in December 2021

LG&E/KU Balancing Authority Area

LG&E/KU Balancing Authority Area

2020 Generation Assumptions

LG&E/KU – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Zorn	Gas	14	0	0	0	0	0	0	0	0	0
Ashwood	Solar	0	0	86	86	86	86	86	86	86	86

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

LG&E/KU Balancing Authority Area

SERTP Regional Transmission Expansion Plan

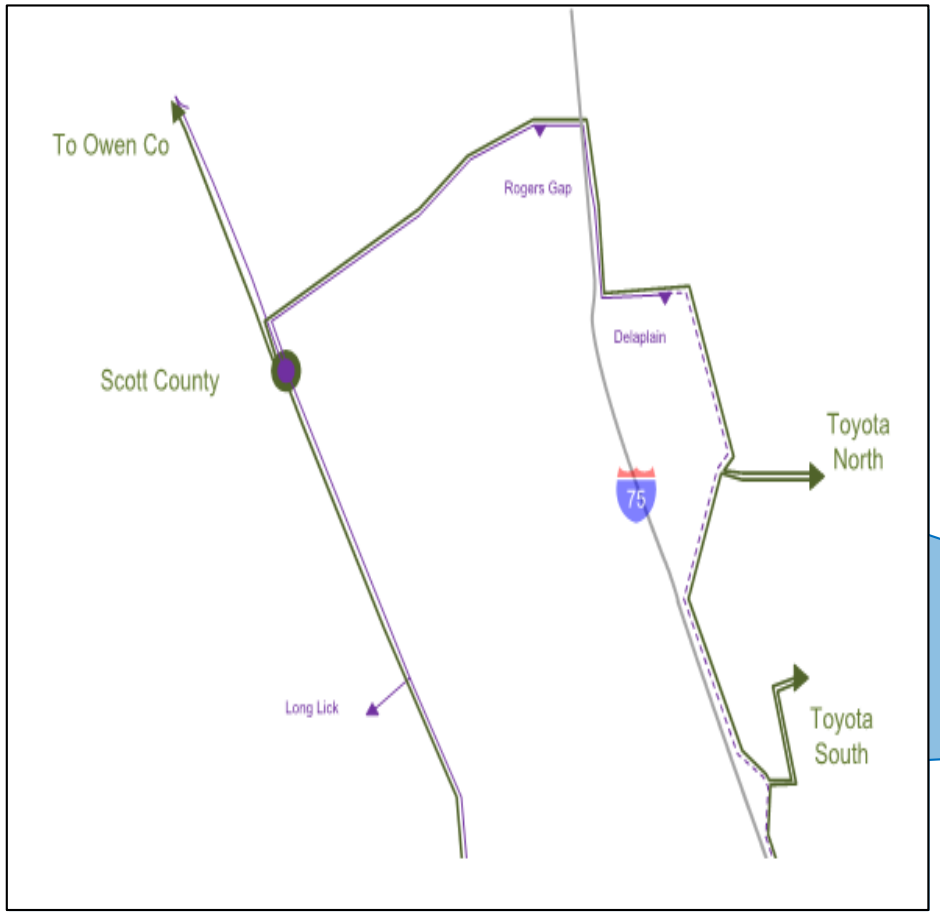
Southeastern Regional TRANSMISSION PLANNING

LG&E/KU Balancing Authority Area

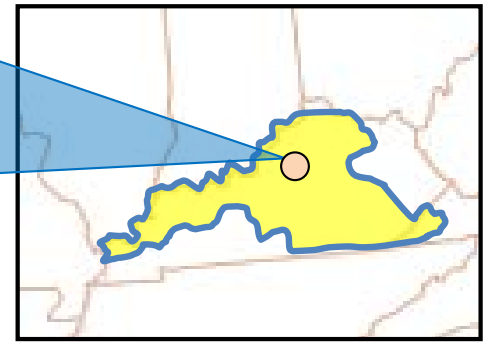
LG&E/KU - 1

- **2021**

MOVE ROGERS GAP LOAD TO 138KV



- **DESCRIPTION:**
  - Convert the Rogers Gap 69kV distribution station to a 138kV station by tapping the existing Scott Co – Toyota North 138kV line.
- **SUPPORTING STATEMENT:**
  - The Adams to Delaplain Tap 69kV transmission line overloads under contingency.



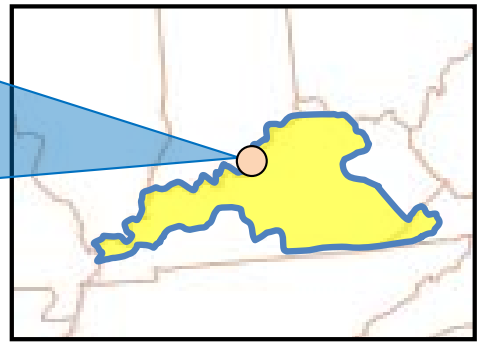
LG&E/KU Balancing Authority Area

LG&E/KU - 2

- **2021**

BLUE LICK 345/161 KV TRANSFORMER

- **DESCRIPTION:**
  - Replace the Blue Lick 345/161 kV, 240 MVA transformer with a 345/161 KV, 450 MVA transformer, reset/replace any CTs less than 2000A and increase the loadability of relays.
- **SUPPORTING STATEMENT:**
  - The existing Blue Lick 345/161 kV transformer overloads under contingency.



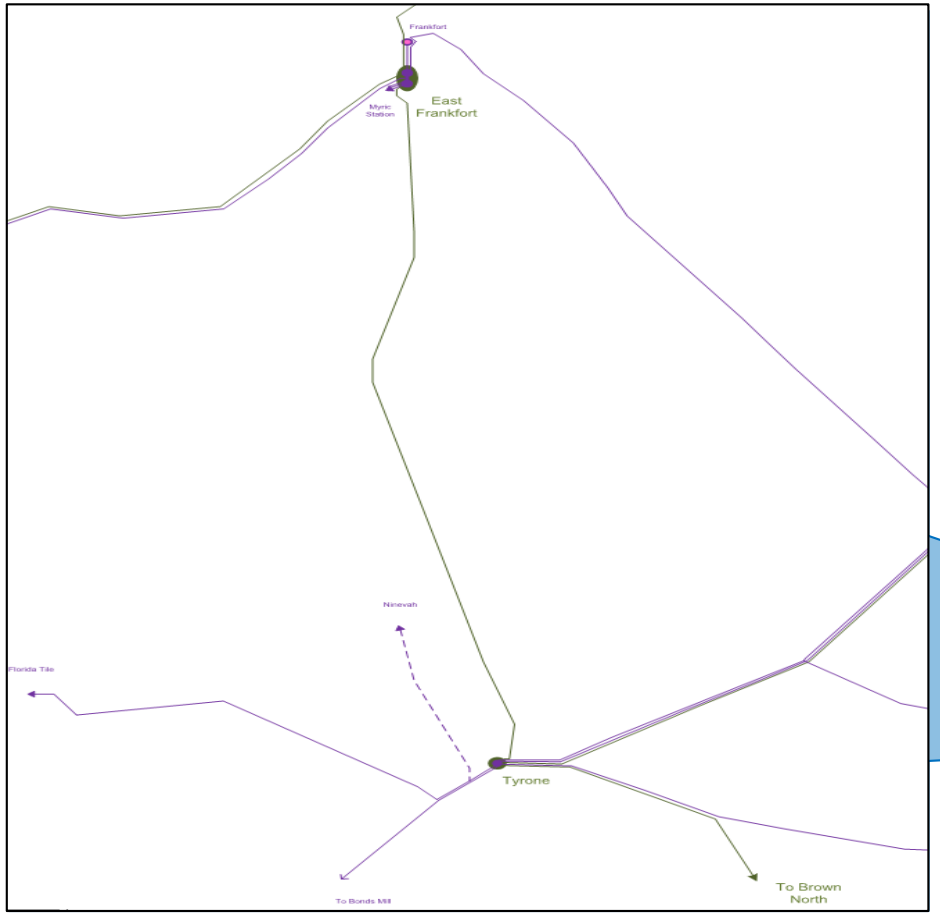
Southeastern Regional TRANSMISSION PLANNING

LG&E/KU Balancing Authority Area

LG&E/KU - 3

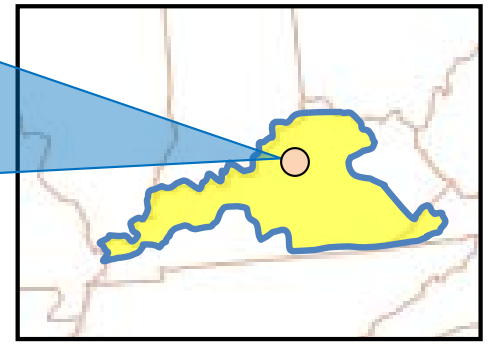
- **2021**

EAST FRANKFORT - TYRONE 138KV TRANSMISSION LINE



- **DESCRIPTION:**
  - Replace breaker 136-704 and associated Bushing CTs at East Frankfort with 1600A equipment. Change the relay settings so protection will not trip under load for less than 1914A.

- **SUPPORTING STATEMENT:**
  - The East Frankfort to Tyrone 138 kV transmission line overloads under contingency.

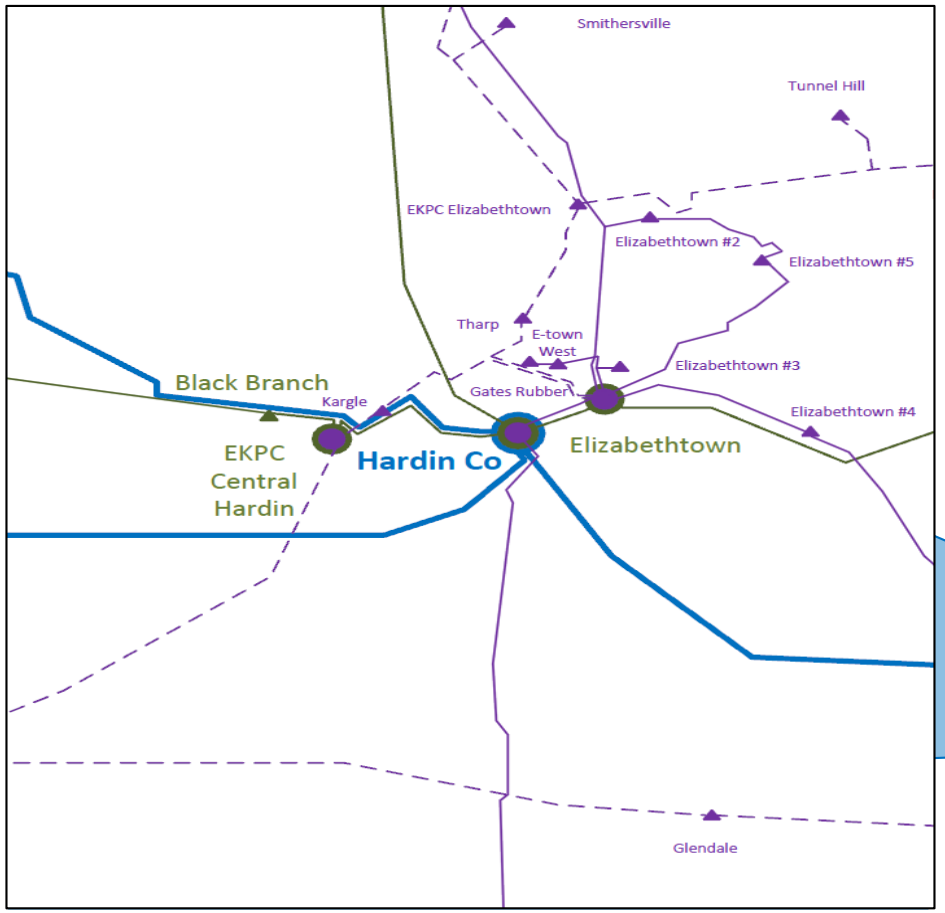


LG&E/KU Balancing Authority Area

LG&E/KU - 4

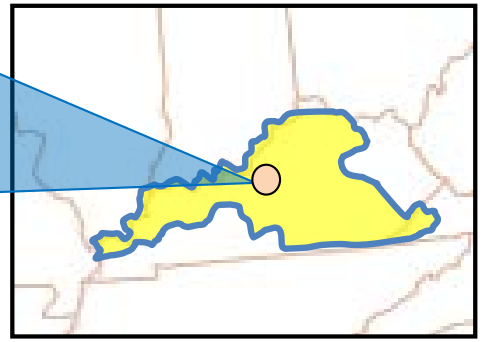
- **2022**

HARDIN CO SUBSTATION ADDITIONS



- **DESCRIPTION:**
  - Install a second 345/138 kV, transformer at Hardin County.
  - Install a second 138/69 kV, transformer at Hardin County
  - Install a second 69 kV line Elizabethtown – Hardin County

- **SUPPORTING STATEMENT:**
  - Additional voltage support in needed in the Hardin Co/Elizabethtown area under contingency.

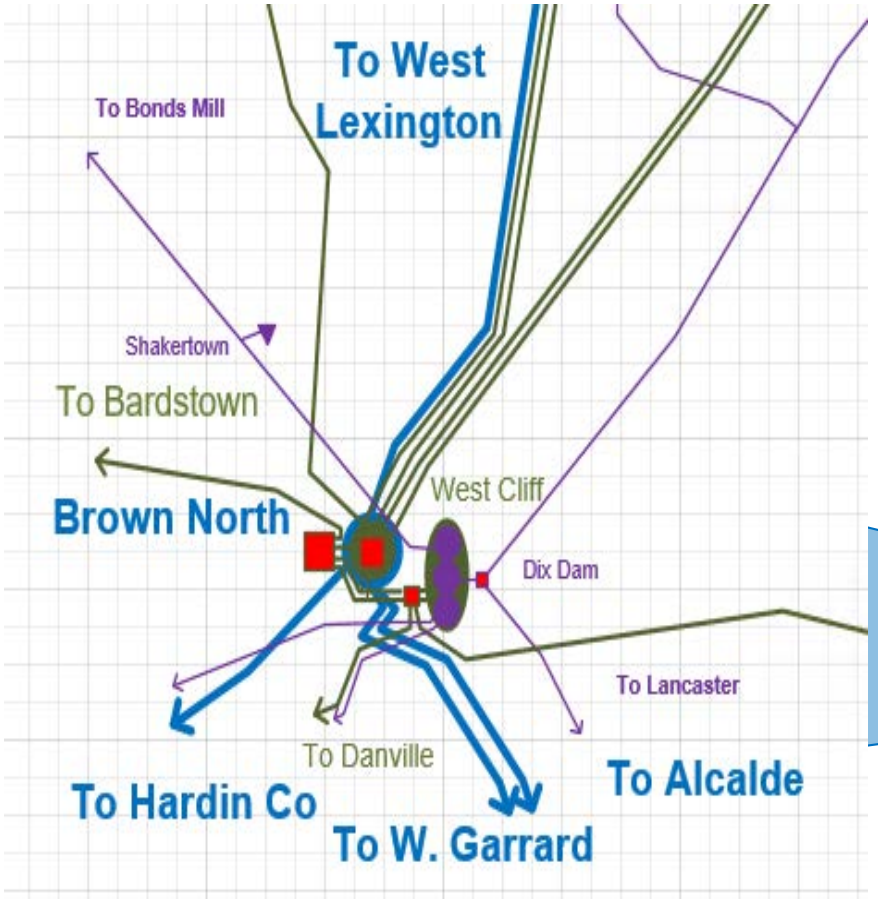


LG&E/KU Balancing Authority Area

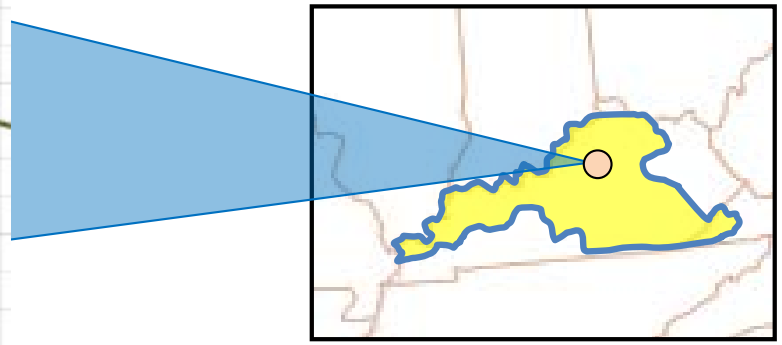
LG&E/KU - 5

- **2023**

BROWN NORTH 345/138 KV #2 TRANSFORMER



- **DESCRIPTION:**
  - Install a second Brown North 450 MVA, 345/138 kV transformer.
- **SUPPORTING STATEMENT:**
  - The West Lexington 345/138 kV Transformer #1 overloads under contingency.
  - Additional voltage support is need in the Lexington area under contingency.



Southeastern Regional TRANSMISSION PLANNING

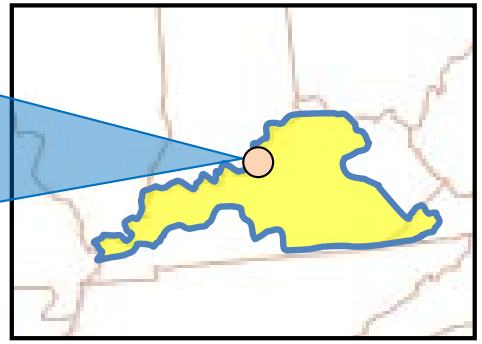
LG&E/KU Balancing Authority Area

LG&E/KU - 6

- **2026**

CANE RUN SWITCHING - CANE RUN 11 TAP 138 KV TRANSMISSION LINE

- **DESCRIPTION**:
  - Upgrade approximately 1.82 miles of the Cane Run Switching to Cane Run 11 Tap 138kV transmission line to a maximum operating temperature of 212°F.
- **SUPPORTING STATEMENT:**
  - The Cane Run Switching to Cane Run 11 Tap 138kV transmission line overloads under contingency.



Southeastern Regional TRANSMISSION PLANNING

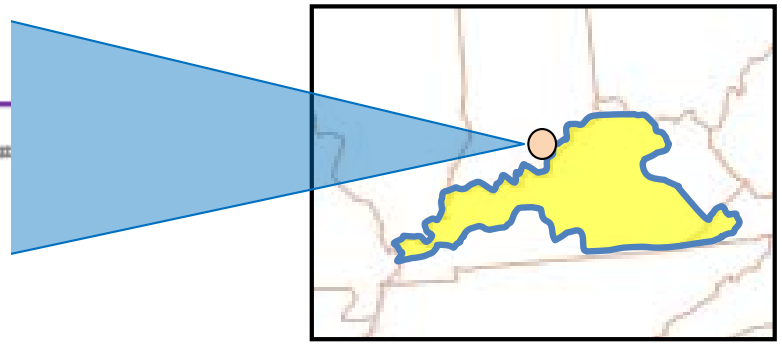
LG&E/KU Balancing Authority Area

LG&E/KU - 7

- **2026**

PADDY'S WEST 345/138 KV TRANSFORMER

- **DESCRIPTION**:
  - Replace breaker PW-3802-TR 1 TIE and the associated bushing CTs at Paddy's West. Also, replace the 138kV bushing CTs associated with the 345/138kV transformer at Paddy's West.
- **SUPPORTING STATEMENT:**
  - The Paddy's West 345/138 kV Transformer overloads under contingency.



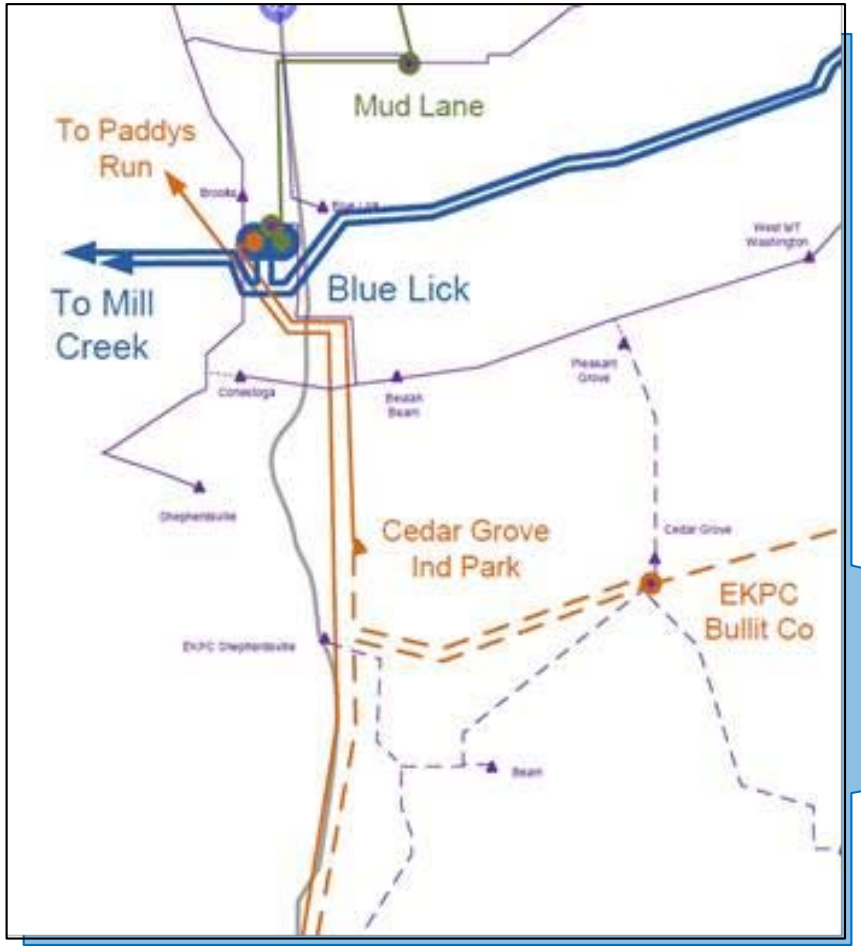
Southeastern Regional TRANSMISSION PLANNING

LG&E/KU Balancing Authority Area

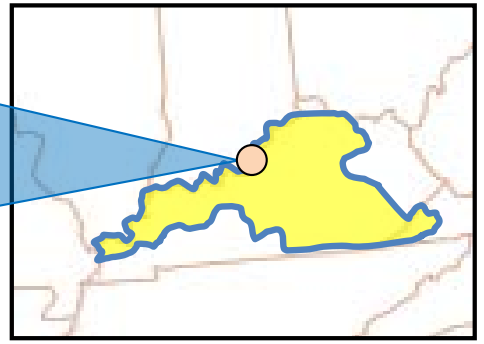
LG&E/KU - 8

- **2029**

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.



LG&E/KU Balancing Authority Area

LG&E/KU Balancing Authority Area

Upcoming 2021 Generation Assumptions

LG&E/KU Balancing Authority Area

LG&E/KU – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Zorn	Gas	14	0	0	0	0	0	0	0	0	0
Ashwood	Solar	0	0	86	86	86	86	86	86	86	86

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

POWERSOUTH Balancing Authority Area

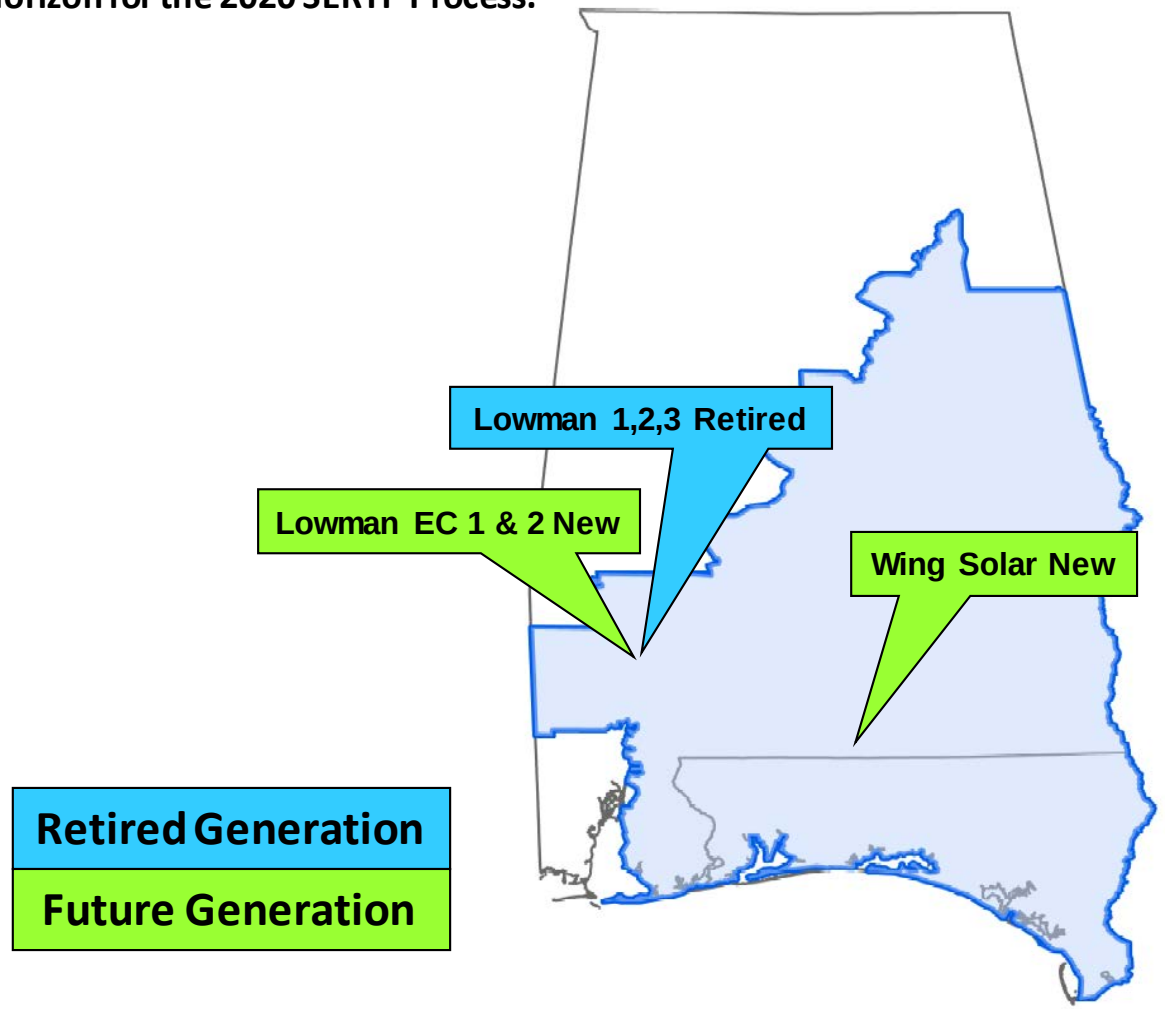
POWERSOUTH Balancing Authority Area

2020 Generation Assumptions

POWERSOUTH Balancing Authority Area

POWERSOUTH – Generation Assumptions

The following diagram depicts the location of generation assumptions <u>that change</u> throughout the ten year planning horizon for the 2020 SERTP Process.



POWERSOUTH – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Lowman 1,2,3	Coal	0	--	--	--	--	--	--	--	--	--
Lowman EC 1 & 2	Gas	--	--	632	632	632	632	632	632	632	632
Wing	Solar	--	--	80	80	80	80	80	80	80	80

POWERSOUTH Balancing Authority Area

POWERSOUTH Balancing Authority Area

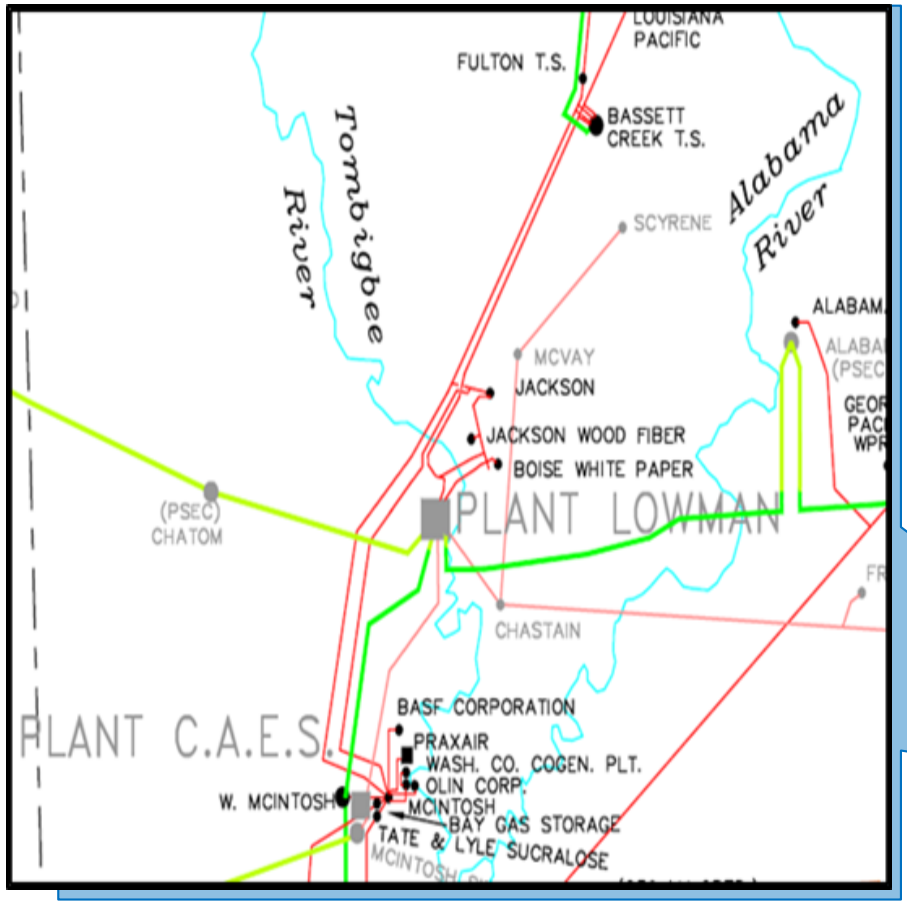
SERTP Regional Transmission Expansion Plan

POWERSOUTH Balancing Authority Area

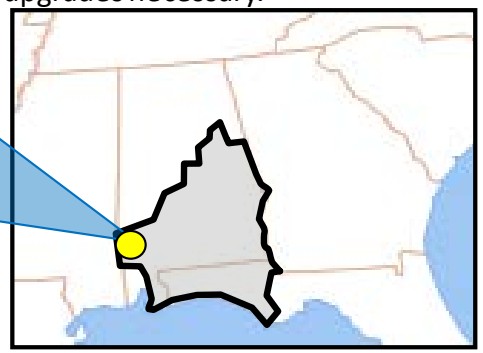
POWERSOUTH – 1

- **2021**

Lowman 230kV Switching Station



- **DESCRIPTION:**
  - PowerSouth will be relocating 4 - 230kV lines terminals:
    - LOWMAN – CHATOM 230KV
    - LOWMAN – WEST MCINTOSH 230KV (APCO)
    - LOWMAN – ARN 230KV
    - LOWMAN – AQC 230KV
  - Upgrading both 230/115kV transformers to 400 MVA units
- **SUPPORTING STATEMENT:**
  - The existing 230kV line terminal locations can result in the loss of two lines for a single breaker failure.
  - Increased generation capacity makes transformer upgrades necessary.

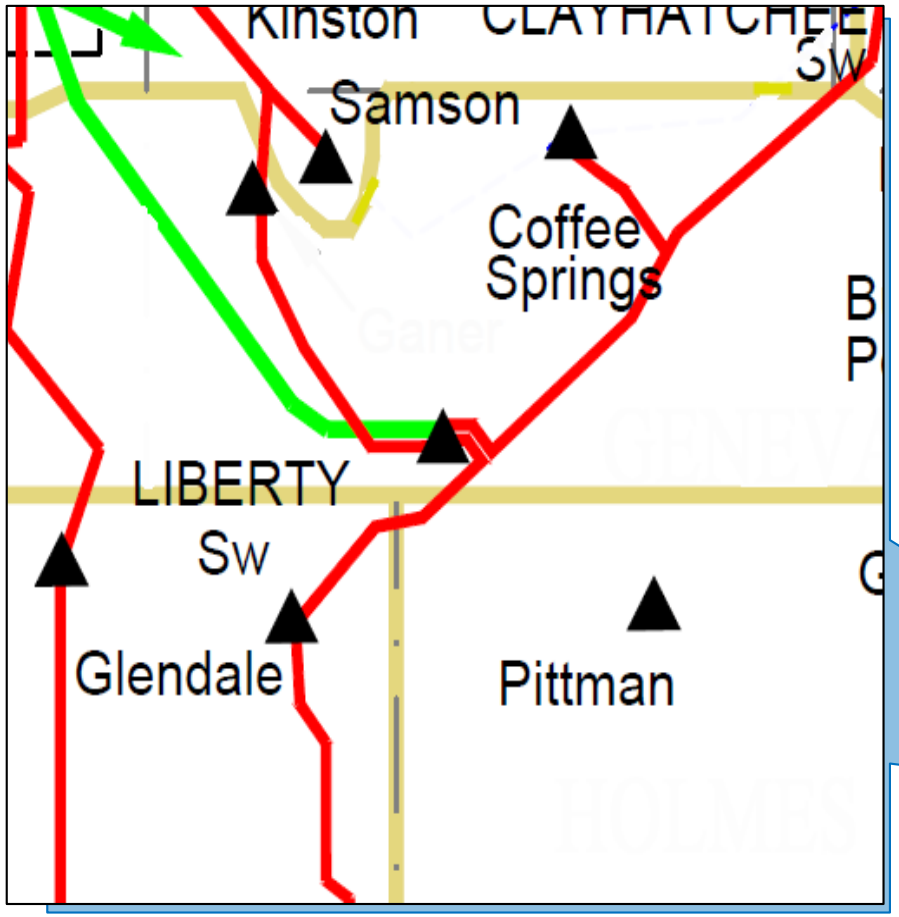


POWERSOUTH Balancing Authority Area

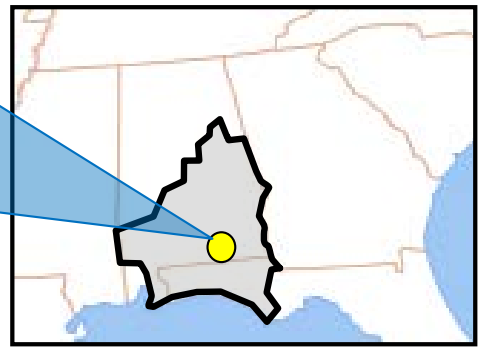
POWERSOUTH – 2

- **2021**

ADD THIRD LIBERTY 230/115 KV TRANSFORMER



- **DESCRIPTION:**
  - Add a third 230/115 kV, 150 MVA transformer.
- **SUPPORTING STATEMENT:**
  - The existing 230/115 kV, 150 MVA transformers at Liberty Substation overload under contingency.

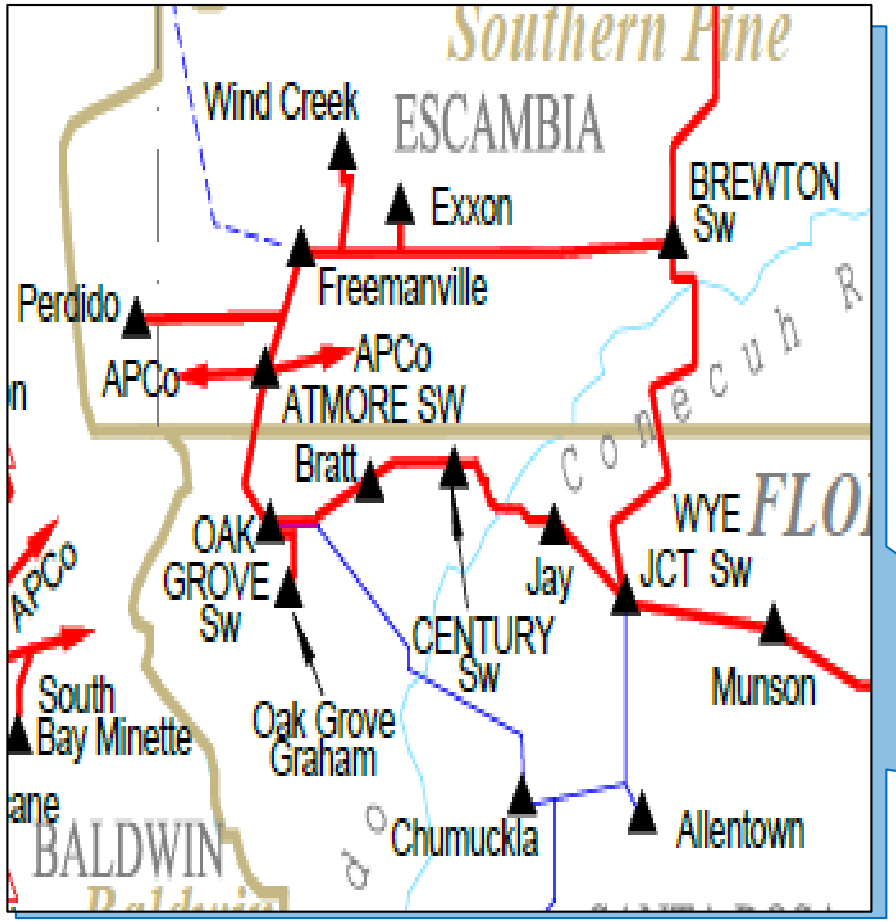


POWERSOUTH Balancing Authority Area

POWERSOUTH - 3

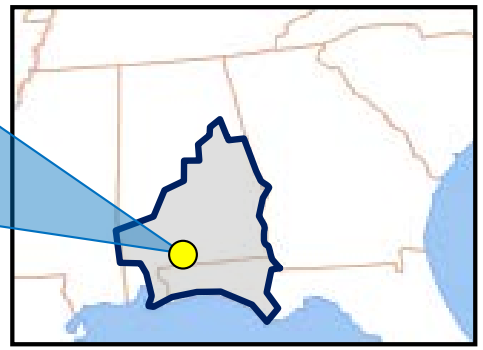
- **2022**

Brewton – Exxon – Freemanville 115 KV TRANSMISSION LINE



- **DESCRIPTION:**
  - Operating temperature upgrade on approximately 25.0 miles of 115 kV transmission line from Brewton 115kV Station to Freemanville Substation to 100°C.

- **SUPPORTING STATEMENT:**
  - The existing 115kV transmission line overloads under contingency. Project will double line capacity from 68 MVA to 134 MVA.

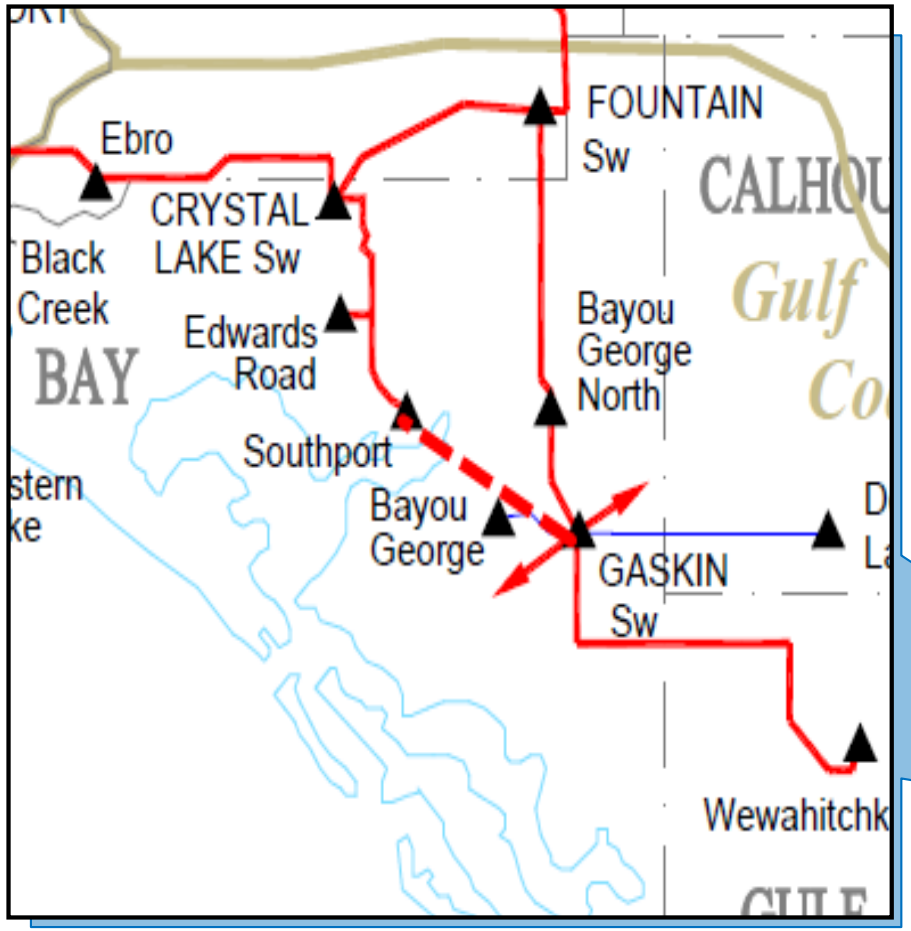


POWERSOUTH Balancing Authority Area

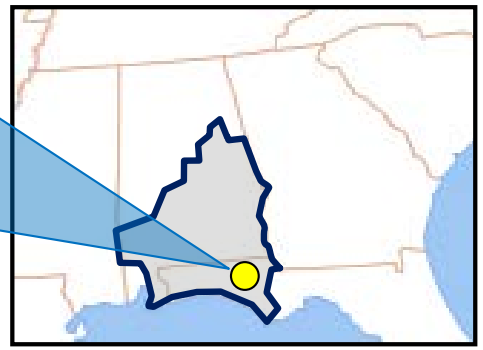
POWERSOUTH - 4

- **2023**

GASKIN – SOUTHPORT 115 KV TRANSMISSION LINE



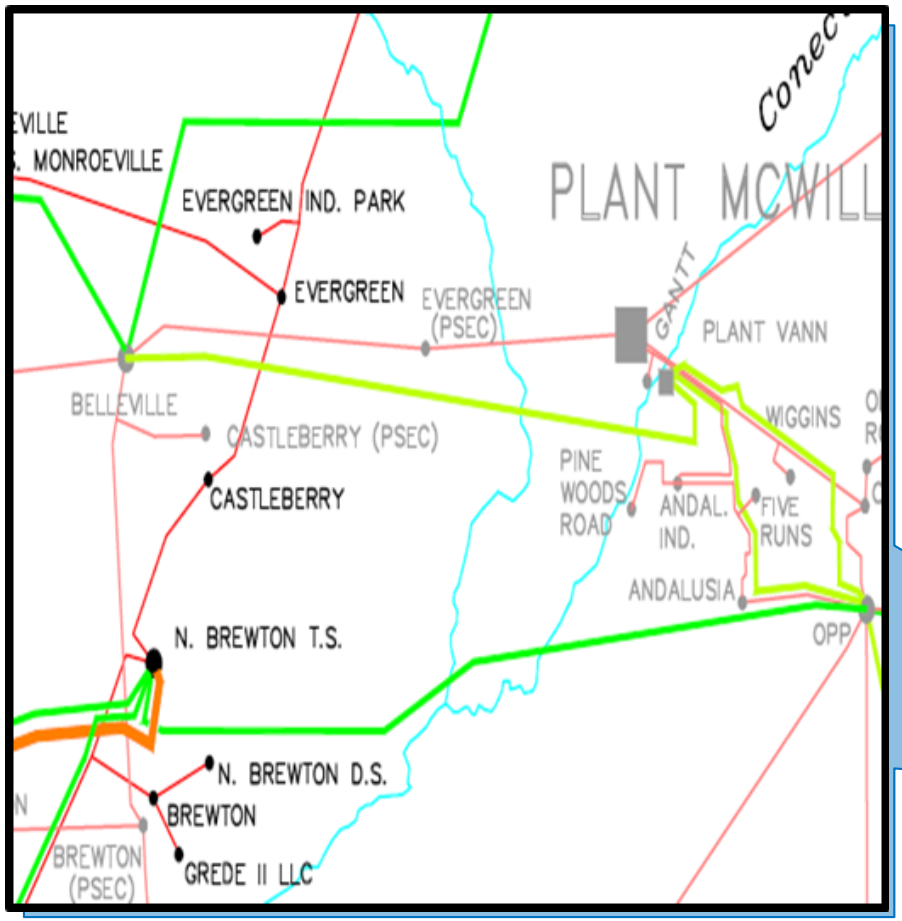
- **DESCRIPTION:**
  - Construct approximately 9.0 miles of new 115 kV transmission line from Gaskin Switching Station to Southport Substation with 795 ACSR at 100°C.
- **SUPPORTING STATEMENT:**
  - Improve the reliability of Gulf Coast Electric's substations by providing a looped service feed.



POWERSOUTH - 5

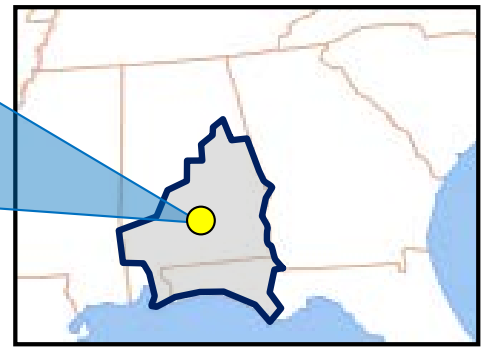
- **2024**

Belleville – Gantt 230 KV TRANSMISSION LINE



- **DESCRIPTION:**
  - Operating temperature upgrade on approximately 40.0 miles of 230 kV transmission line from Belleville 230kV Station to Gantt 230kV Substation to 100°C. Project will increase line capacity from 469 MVA to 586 MVA.

- **SUPPORTING STATEMENT:**
  - The existing 230kV transmission line overloads under contingency.



POWERSOUTH Balancing Authority Area

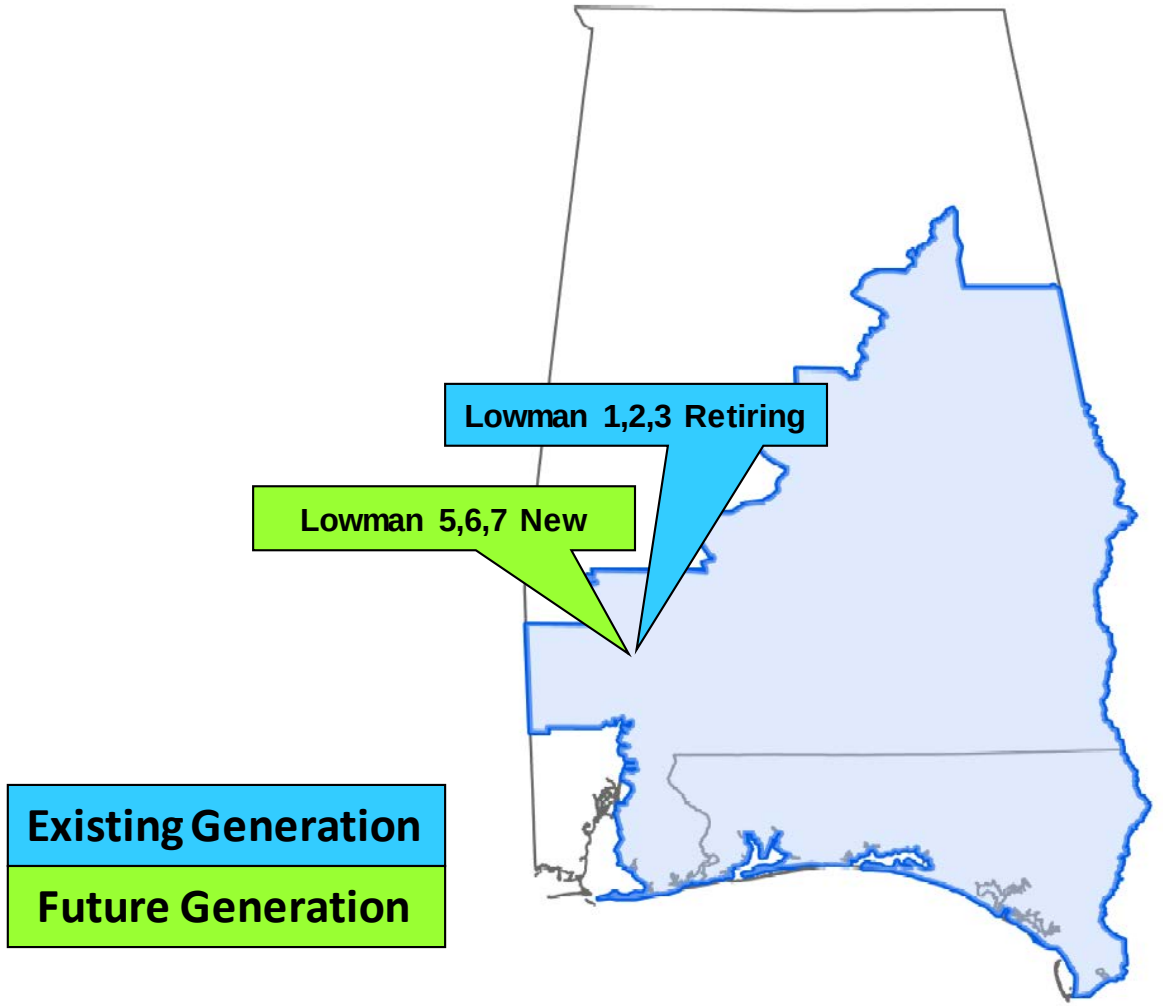
POWERSOUTH Balancing Authority Area

Upcoming 2021 Generation Assumptions

POWERSOUTH Balancing Authority Area

POWERSOUTH – Generation Assumptions

The following diagram depicts the location of generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process.



POWERSOUTH Balancing Authority Area

POWERSOUTH – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Lowman 1,2,3	Coal	0	--	--	--	--	--	--	--	--	--
Lowman 5,6	Gas	--	--	632	632	632	632	632	632	632	632

SOUTHERN Balancing Authority Area

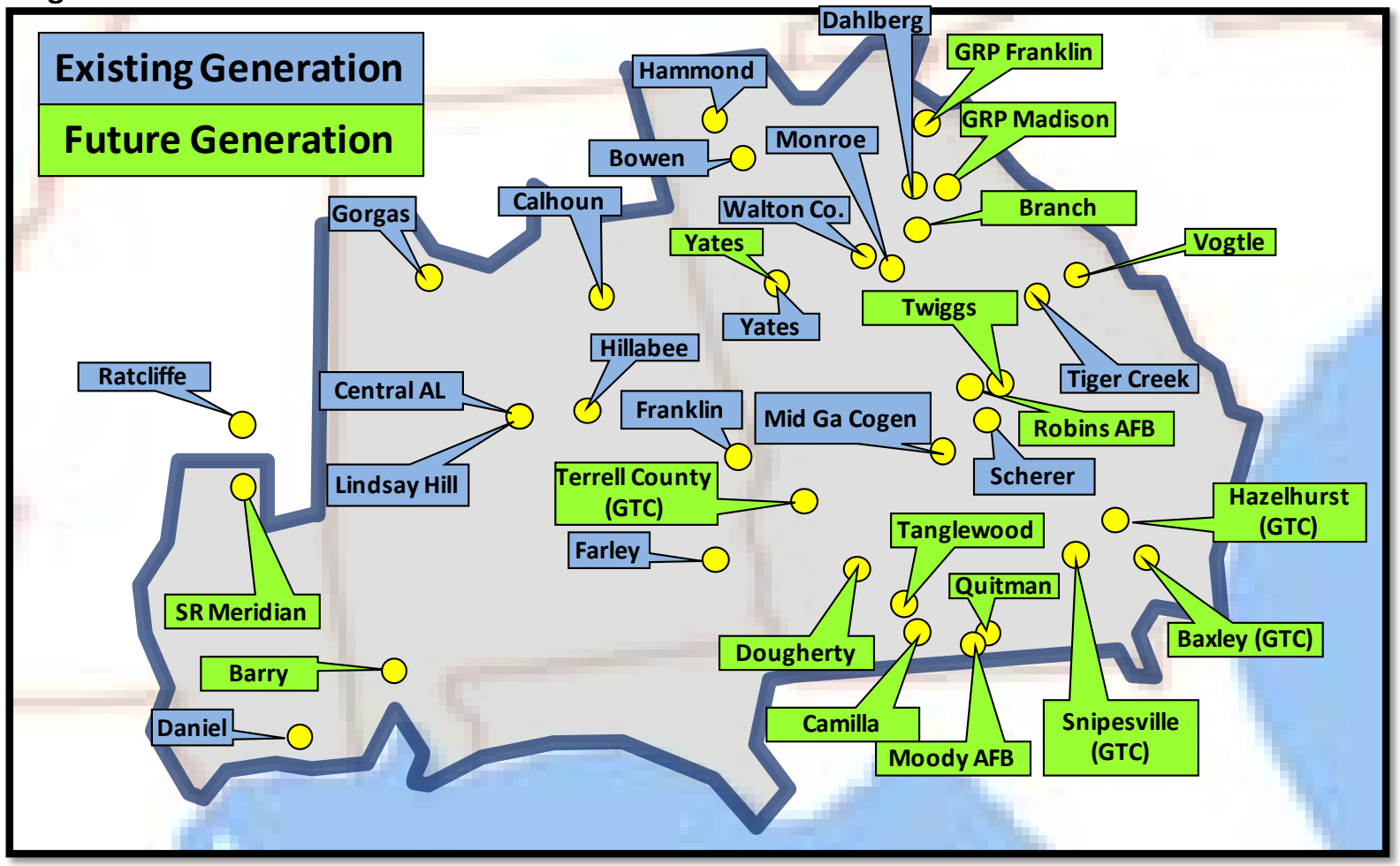
SOUTHERN Balancing Authority Area

2020 Generation Assumptions

SOUTHERN Balancing Authority Area

SOUTHERN – Generation Assumptions

The following diagram depicts the location of generation assumptions <u>that change</u> throughout the ten year planning horizon for the 2020 SERTP Process.



SOUTHERN Balancing Authority Area

Southern Company – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
CALHOUN 1-4	Gas	632	632	0	--	--	--	--	--	--	--
DAHLBERG 2, 6, 8, 10	Gas	298	298	298	298	0	--	--	--	--	--
MID GA COGEN	Gas	300	300	300	300	300	300	300	0	--	--
MONROE POWER	Gas	309	309	309	0	--	--	--	--	--	--
TIGER CREEK 1&4	Gas	313	313	0	--	--	--	--	--	--	--
WALTON COUNTY	Gas	465	465	0	--	--	--	--	--	--	--

SOUTHERN Balancing Authority Area

Southern Company – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
BARRY[1]	Gas	--	--	--	685	685	685	685	685	685	685
GASTON 1-4	Gas	465	465	465	515	515	515	515	515	515	515
YATES 6-7	Gas	649	649	649	714	714	714	714	714	714	714
FARLEY 1	Nuclear	874	898	898	898	898	898	898	898	898	898
FARLEY 2	Nuclear	901	901	901	901	901	901	901	901	901	901
VOGTLE 3	Nuclear	504	504	504	504	504	504	504	504	504	504
VOGTLE 4	Nuclear	--	504	504	504	504	504	504	504	504	504

(1) This assumption may be modified as resource decisions are made by the corresponding LSEs pursuant to applicable regulatory processes.

SOUTHERN Balancing Authority Area

Southern Company – Generation Assumptions (Cont.)

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
AL SOLAR CENTER[1]	Solar	--	--	80	80	80	80	80	80	80	80
ANNISTON[1]	Solar	--	80	80	80	80	80	80	80	80	80
DALLAS COUNTY[1]	Solar	--	--	--	80	80	80	80	80	80	80
DOTHAN[1]	Solar	--	--	--	80	80	80	80	80	80	80
TALLADEGA[1]	Solar	--	--	--	80	80	80	80	80	80	80
QUITMAN 2	Solar	--	150	150	150	150	150	150	150	150	150
COOL SPRINGS	Solar	--	213	213	213	213	213	213	213	213	213
BROKEN SPOKE	Solar	--	195	195	195	195	195	195	195	195	195

(1) This assumption may be modified as resource decisions are made by the corresponding LSEs pursuant to applicable regulatory processes.

SOUTHERN Balancing Authority Area

SOUTHERN COMPANY – 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
BOWEN	159	159	159	159	159	159	159	159	159	159
CENTRAL ALABAMA	885	885	890	890	890	890	890	890	890	890
DAHLBERG	494	494	494	494	494	494	494	494	494	494
DANIEL	650	650	650	600	600	600	600	600	600	600
HAMMOND	10	10	10	10	10	10	10	10	10	10
HILLABEE	350	350	350	350	350	350	350	350	350	350
LINDSAY HILL	300	300	300	300	300	300	300	300	300	300
SCHERER	1131	1131	1131	1131	1131	1131	1131	1131	1131	1131
VOGTLE	206	206	206	206	206	206	206	206	206	206

SOUTHERN Balancing Authority Area

GTC – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
SANDHILLS	SOLAR	--	--	--	--	--	--	--	--	--	--
BAXLEY	SOLAR	25	25	25	25	25	25	25	25	25	25
TERRELL COUNTY	SOLAR	74	74	74	74	74	74	74	74	74	74
SR LUMPKIN	SOLAR	--	100	100	100	100	100	100	100	100	100
LANCASTER	SOLAR	80	80	80	80	80	80	80	80	80	80
ODOM	SOLAR	20	20	20	20	20	20	20	20	20	20
VOGTLE 3	NUCLEAR	330	330	330	330	330	330	330	330	330	330
VOGTLE 4	NUCLEAR	--	330	330	330	330	330	330	330	330	330

MEAG – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
VOGTLE 3	NUCLEAR	250	250	250	250	250	250	250	250	250	250
VOGTLE 4	NUCLEAR	--	250	250	250	250	250	250	250	250	250

DALTON – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
VOGTLE 3	NUCLEAR	19	19	19	19	19	19	19	19	19	19
VOGTLE 4	NUCLEAR	--	19	19	19	19	19	19	19	19	19

SOUTHERN Balancing Authority Area

SOUTHERN (WEST) Balancing Authority Area

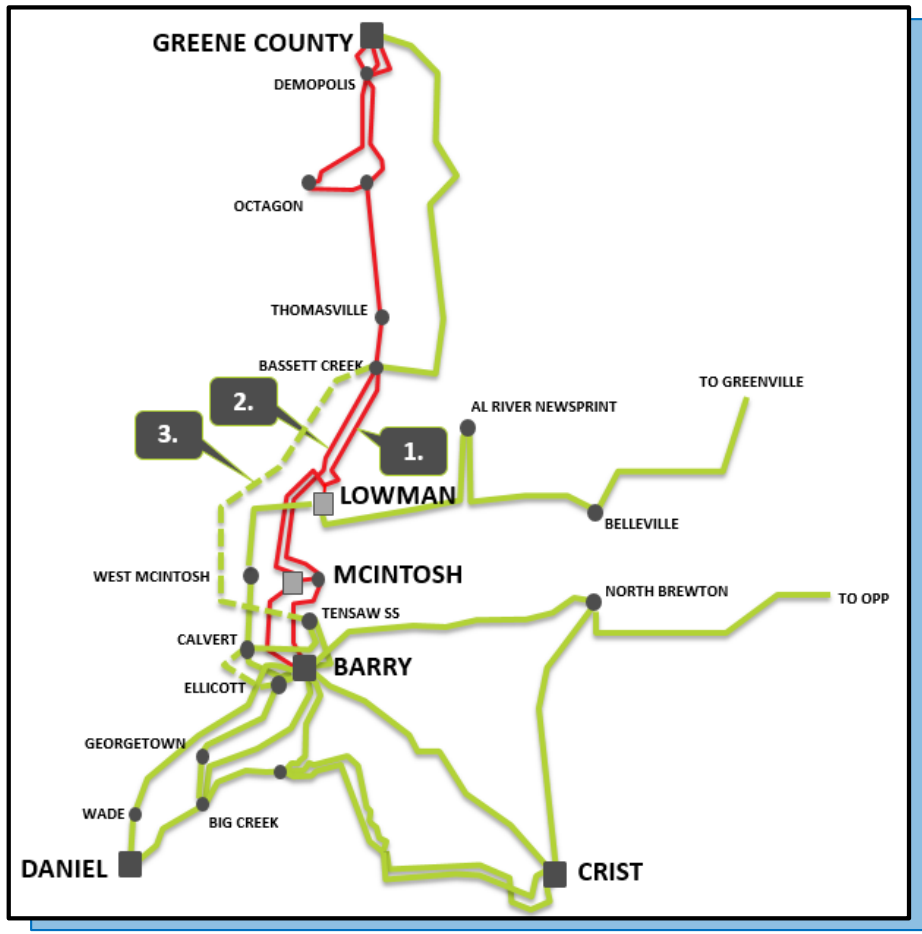
SERTP Regional Transmission Expansion Plan

SOUTHERN Balancing Authority Area

SOUTHERN – 1W

- **2022**

BASSETT CREEK CORRIDOR PROJECTS



PROJECT DESCRIPTION:

1. Reconductor approximately 24.0 miles along the Bassett Creek to Lowman 115 kV transmission line with 1033.5 ACSS at 200°C. (Complete)
2. Reconductor approximately 46.0 miles along the Bassett Creek to McIntosh 115 kV transmission line with 1033.5 ACSS at 200°C.
3. Construct approximately 61.0 miles of 1351 ACSS 230 kV transmission line at 200°C from Bassett Creek to Tensaw then Calvert to Ellicott.

SUPPORTING STATEMENT:

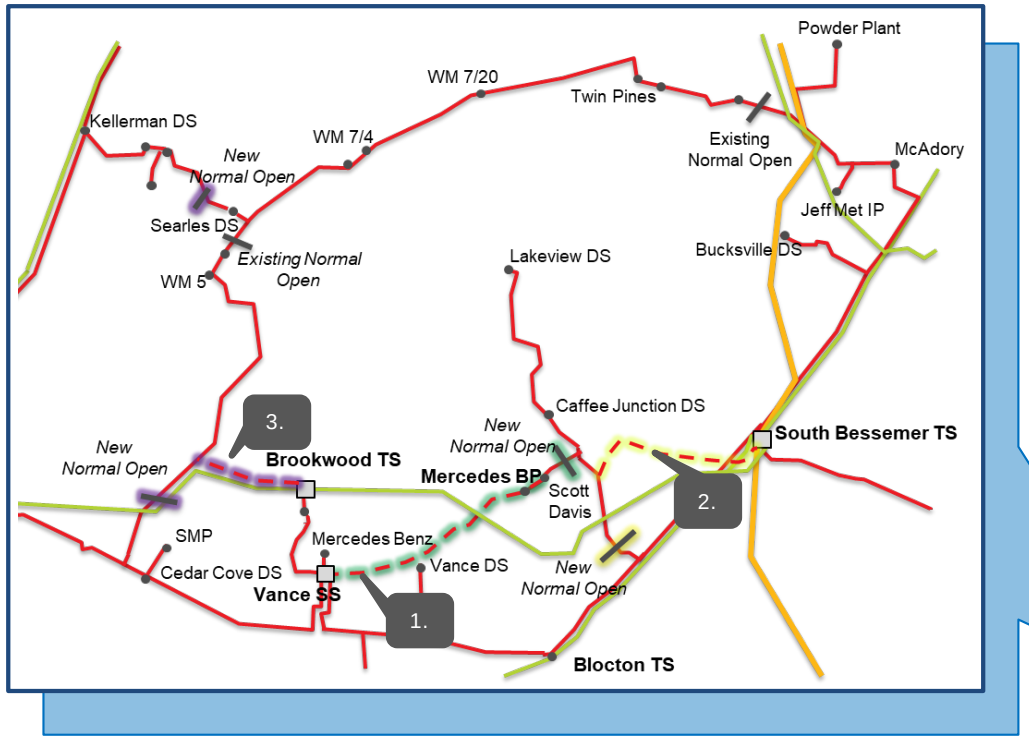
- There are multiple transmission lines in the local area that overload under contingency. These projects provide additional operational and maintenance flexibility which then increases reliability.

SOUTHERN Balancing Authority Area

SOUTHERN – 2W

- **2023**

HWY 11 BROOKWOOD AREA SOLUTION

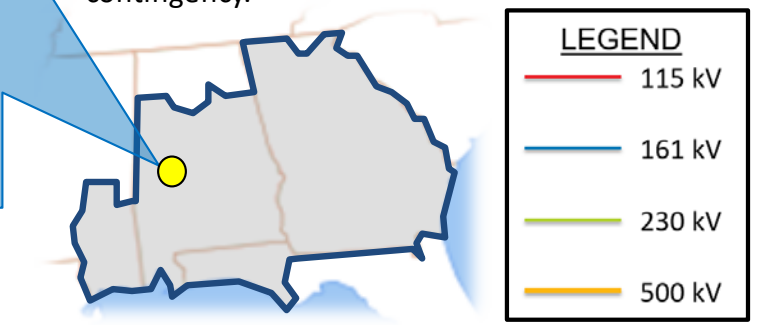


PROJECT DESCRIPTION:

1. Construct approximately 6.0 miles of 795 ACSR from Vance SS to Scott Davis DS 115 kV transmission line.
2. Construct a new approximately 5.2 mile 115 kV TL South Bessemer to Scott Davis Tap with 795 26/7 ACSR at 100°C.
3. Construct a new approximately 4 mile 115 kV TL from Brookwood TS to Cedar Cove Tap with 795 26/7 ACSR at 100°C.

SUPPORTING STATEMENT:

- The Vance SS – South Bessemer TS 115 kV transmission line overloads under contingency. This project also addresses voltage constraints under contingency.

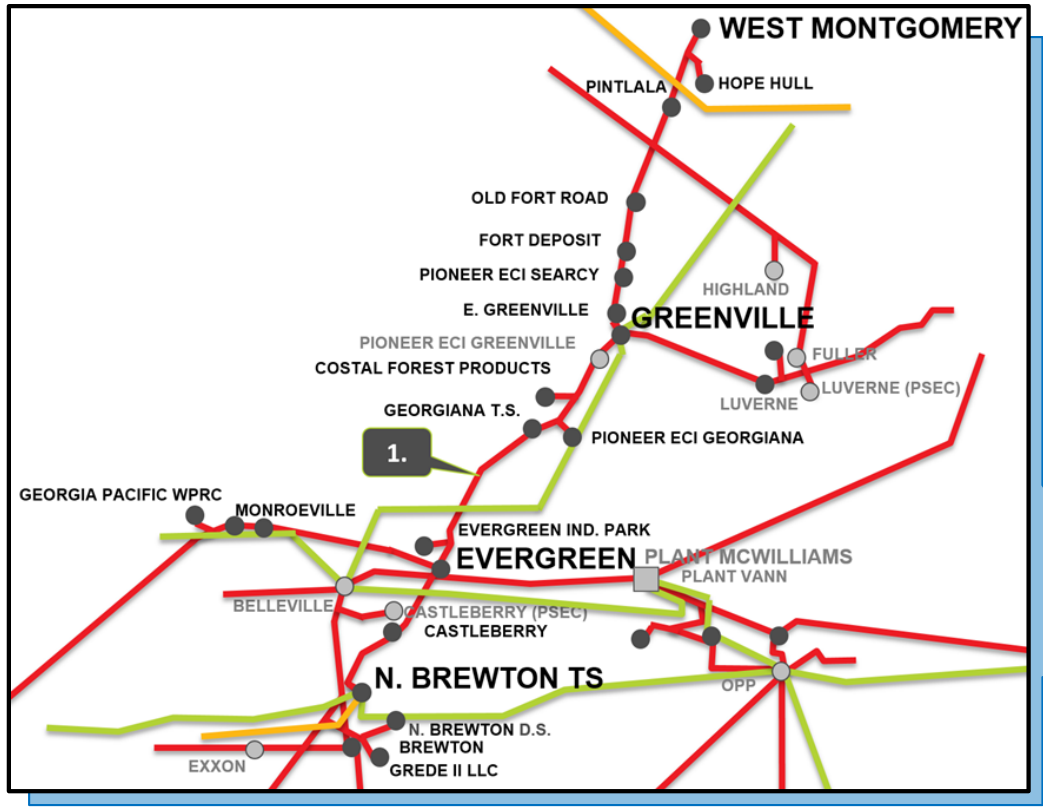


SOUTHERN Balancing Authority Area

SOUTHERN – 3W

- **2023**

CENTRAL CORRIDOR SOLUTION 115 KV PROJECT

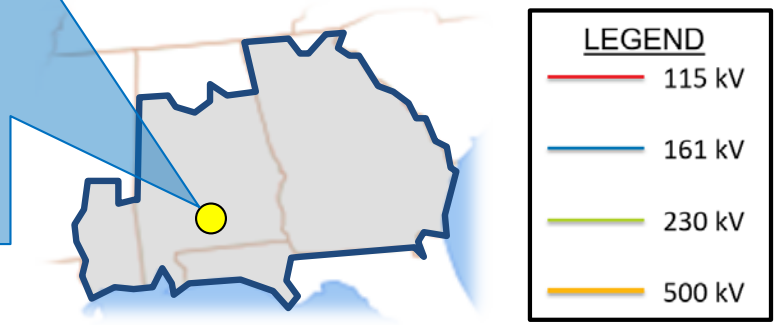


PROJECT DESCRIPTION:

1. Rebuild approximately 97.0 miles of 115 kV transmission line from West Montgomery to North Brewton 115 kV transmission line with 795 ACSS at 200°C.

SUPPORTING STATEMENT:

- Multiple sections of the central corridor overload under contingency. This project also provides additional operational and maintenance flexibility which then increases reliability.

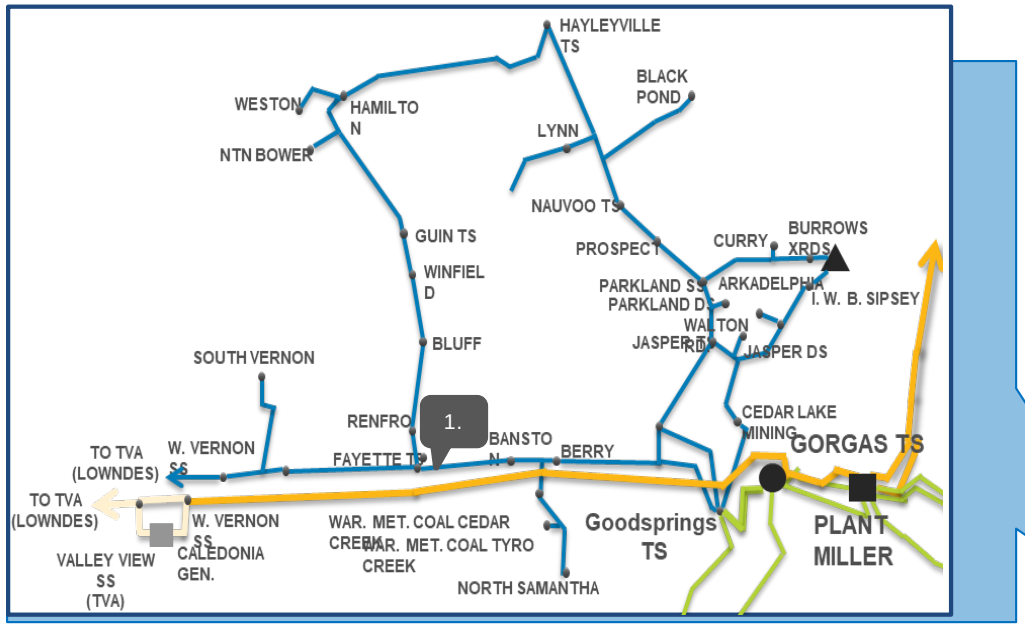


SOUTHERN Balancing Authority Area

SOUTHERN – 4W

- **2023**

FAYETTE – GOODSPRINGS TS 161 KV TRANSMISSION LINE

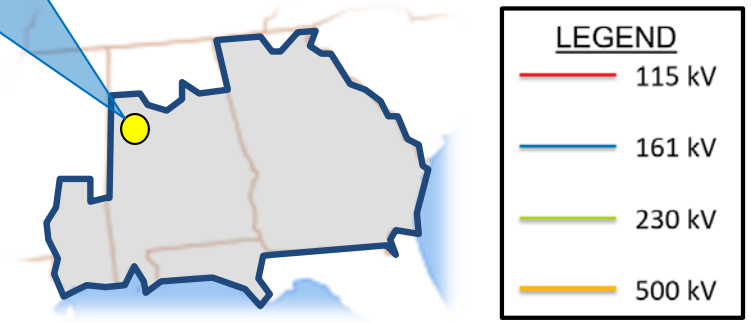


PROJECT DESCRIPTION:

1. Rebuild approximately 37.0 miles of 397 ACSR from Fayette to Goodsprings TS 161 kV transmission line with 795 ACSS at 200°C.

SUPPORTING STATEMENT:

- The Fayette – Goodsprings TS 161 kV transmission line overloads under contingency.

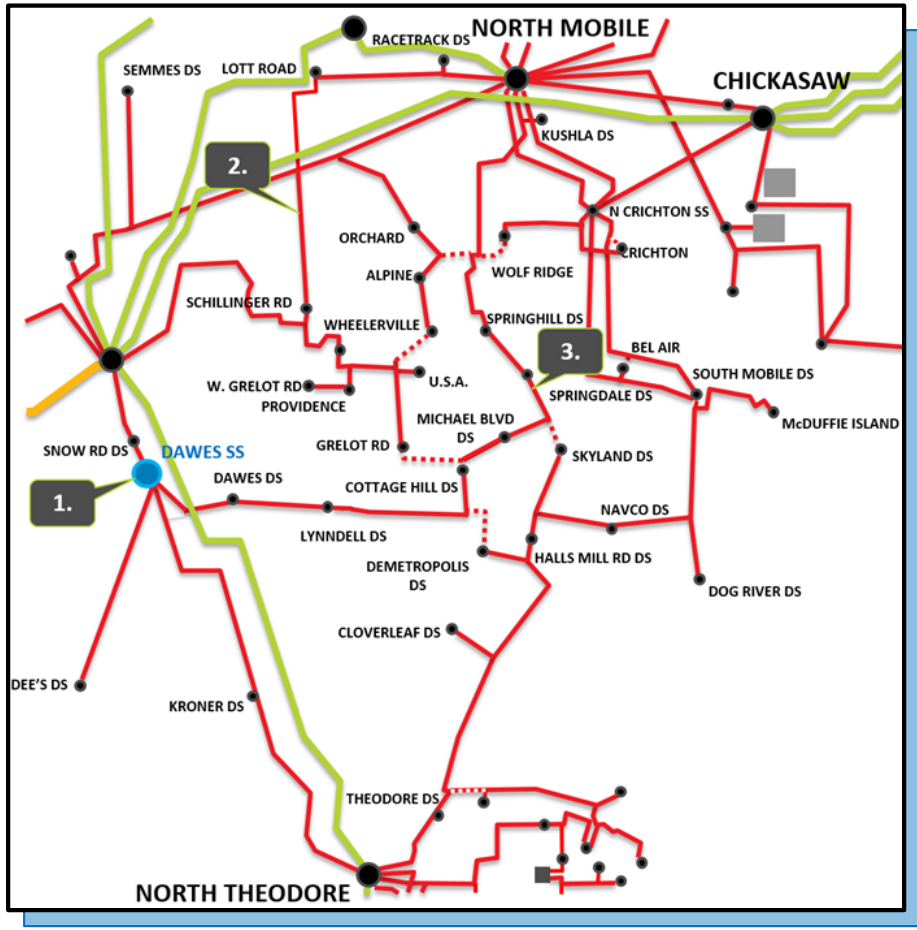


SOUTHERN Balancing Authority Area

SOUTHERN – 5W

- **2023**

MOBILE AREA NETWORKING

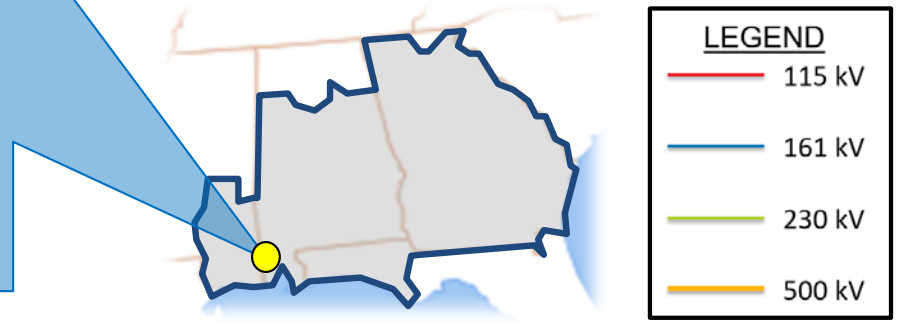


PROJECT DESCRIPTION:

1. Construct a new substation at Dawes Tap on the Big Creek to N. Theodore 115 kV transmission line.
2. Reconductor approximately 4.0 miles of 115 kV transmission line from Lott Road to Schillinger Road with 795 ACSS at 200°C.
3. Reconductor approximately 6.3 miles of 115 kV transmission line from North Mobile to Michael Blvd with 397 ACSS at 200°C.

SUPPORTING STATEMENT:

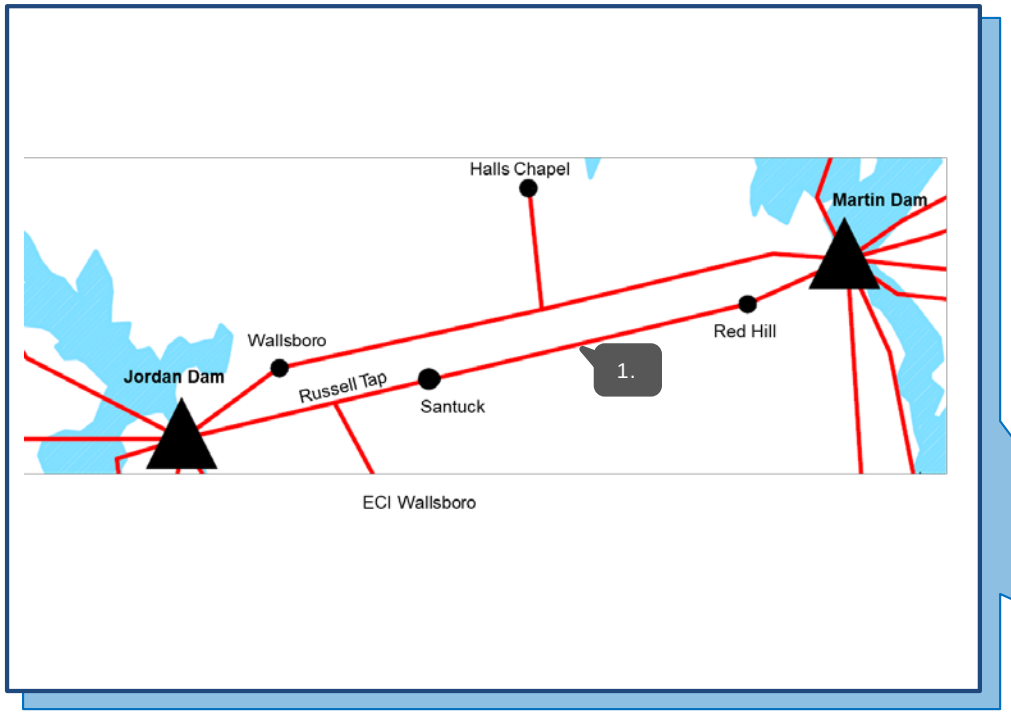
- Provides additional operational and maintenance flexibility which then increases reliability.



SOUTHERN – 6W

- **2023**

JORDAN DAM – MARTIN DAM 115 KV TL (LINE B)

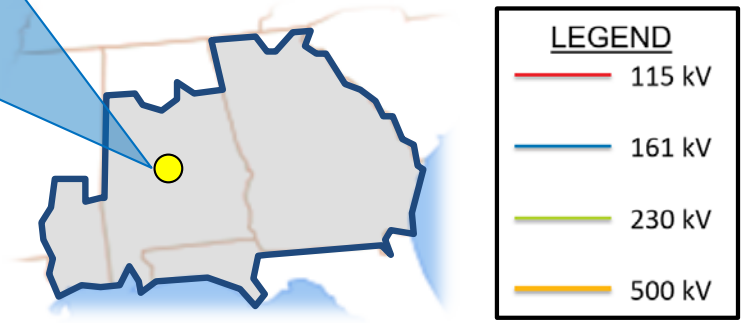


PROJECT DESCRIPTION:

1. Reconductor approximately 21 miles of 397 ACSR with 795 ACSR at 100°C.

SUPPORTING STATEMENT:

- Provides additional operational and maintenance flexibility which then increases reliability.

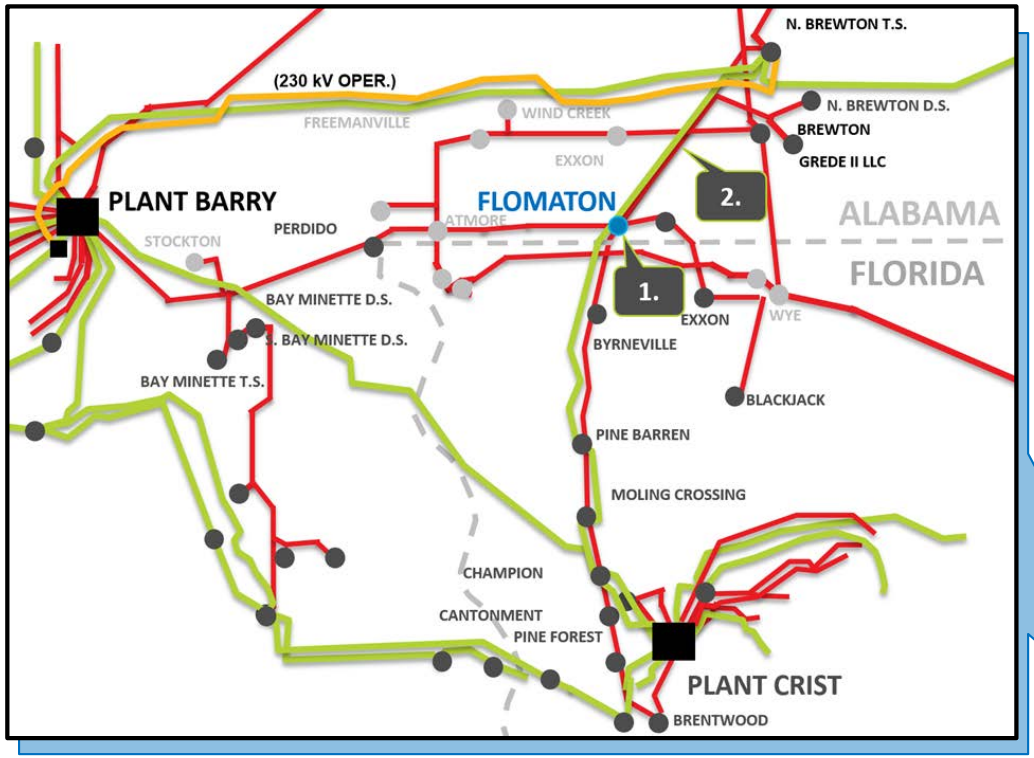


SOUTHERN Balancing Authority Area

SOUTHERN – 7W

- **2024**

FLOMATON 230/115 KV SUBSTATION

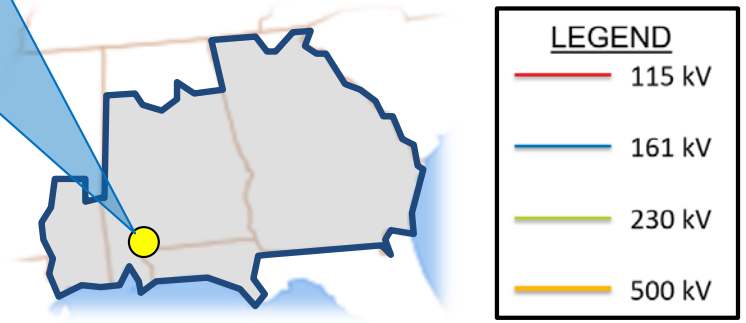


PROJECT DESCRIPTION:

1. Construct a new Flomaton 230/115 kV, 480 MVA transformer at Flomaton TS.
2. Reconductor approximately 16.0 miles of 795 ACSR from N. Brewton to Flomaton 115 kV with 795 ACSS at 200°C.

SUPPORTING STATEMENT:

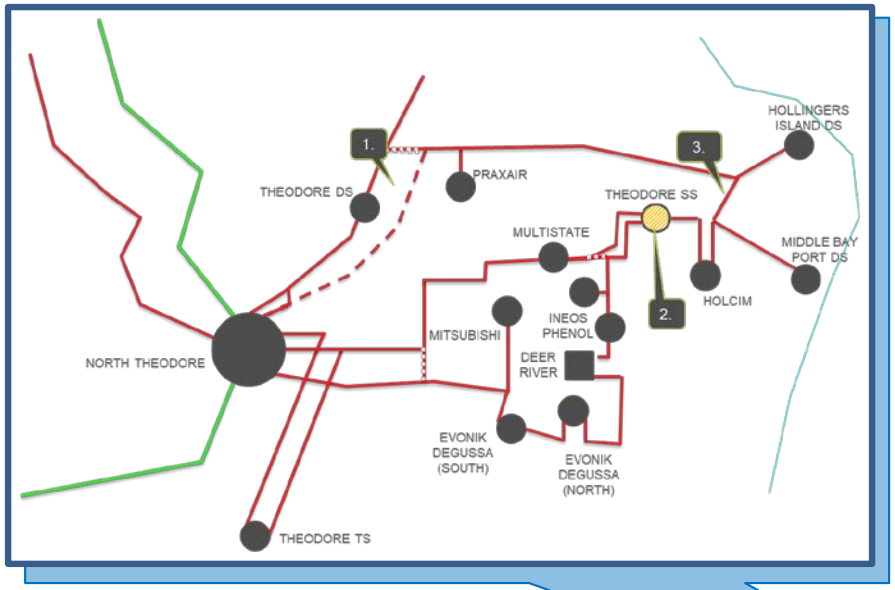
- Provides additional operational and maintenance flexibility which then increases reliability. This project also provides voltage support under contingency scenarios.



SOUTHERN – 8W

- **2024**

NORTH THEODORE AREA 115 KV PROJECT

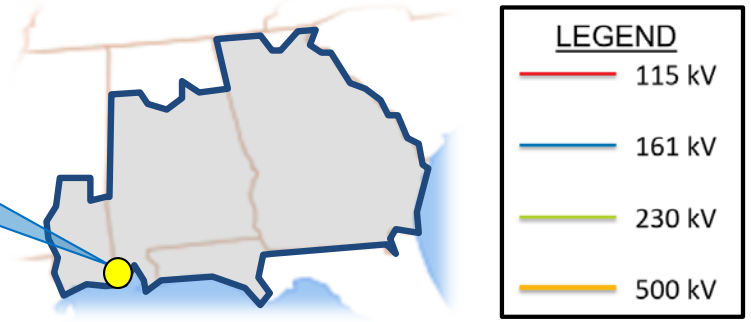


PROJECT DESCRIPTION:

1. Construct approximately 5.3 miles of new 115 kV transmission line to the Praxair Tap from North Theodore.
2. Construct a switching station near Multistate CU.
3. Reconductor approximately 1.0 mile of the Hollinger's Island DS – Holcim CU 115 kV transmission line to 795 ACSR at 100°C

SUPPORTING STATEMENT:

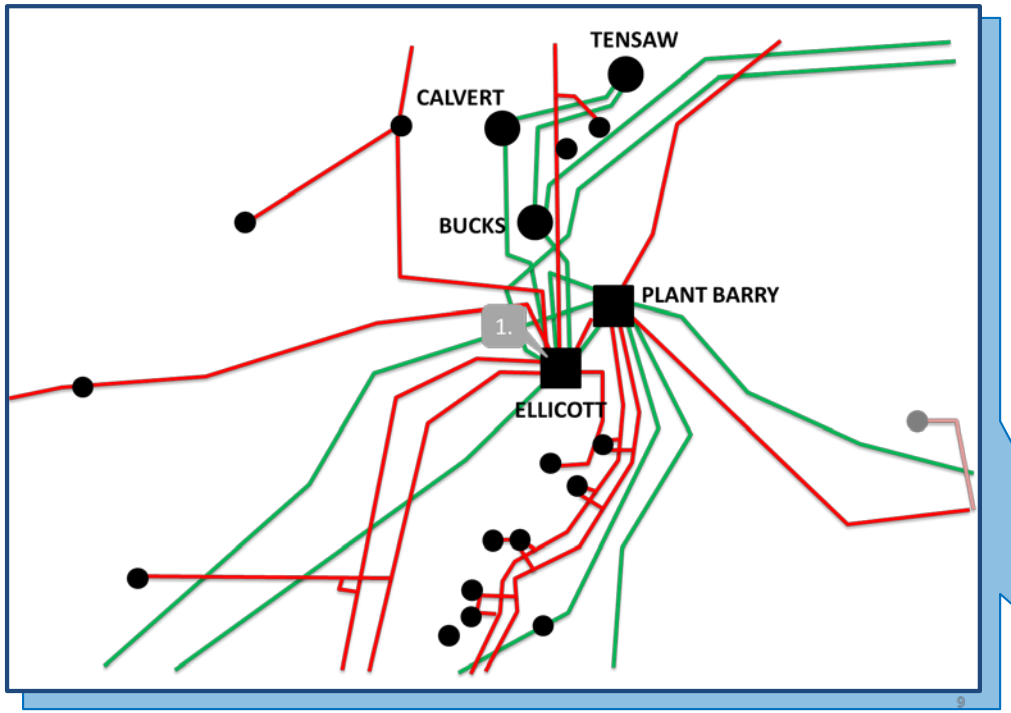
- Provides additional operational and maintenance flexibility which then increases reliability.



SOUTHERN – 9W

- **2024**

ELLICOTT SUBSTATION EXPANSION PROJECT

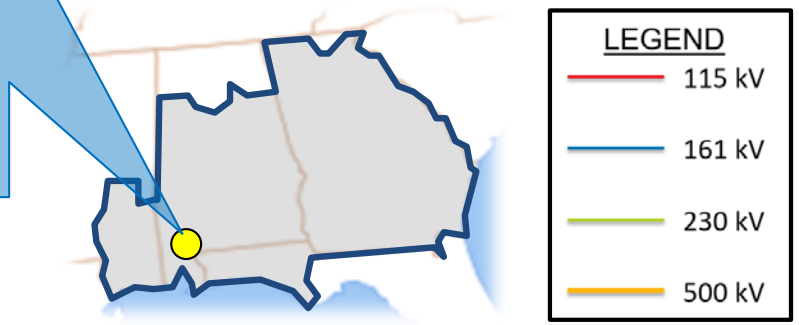


PROJECT DESCRIPTION:

1. Relocate existing 115 kV Lines to a new 115 kV substation

SUPPORTING STATEMENT:

- Upgrade existing and construct new transmission facilities to provide additional operational and maintenance flexibility, which increases reliability.

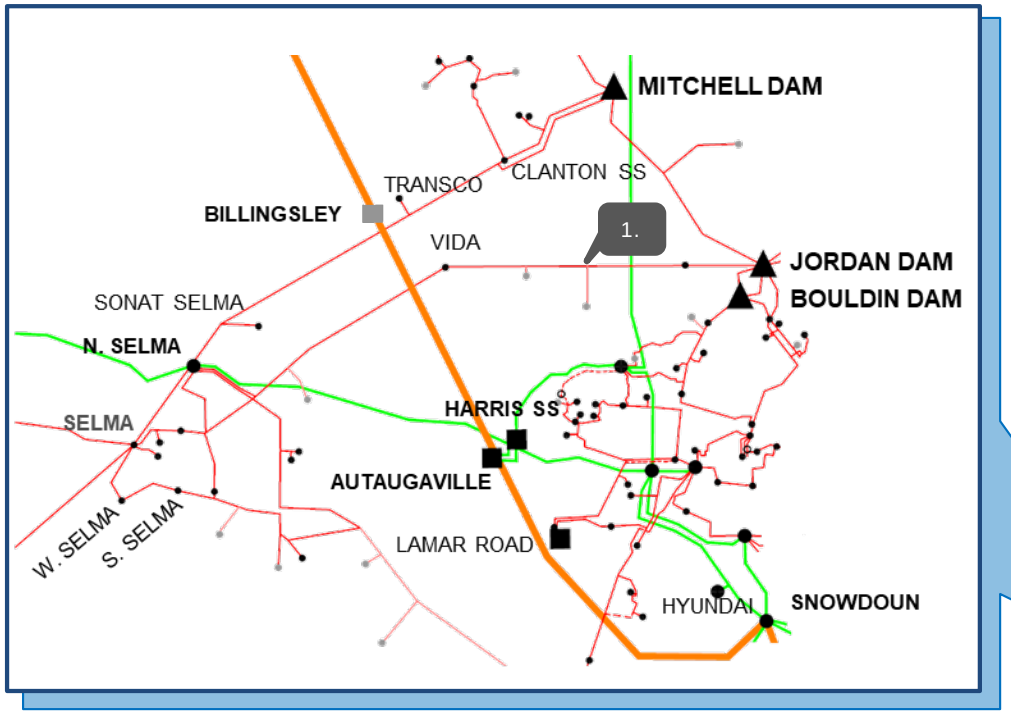


SOUTHERN Balancing Authority Area

SOUTHERN – 10W

- **2024**

JORDAN DAM – NORTH SELMA 115 KV TL

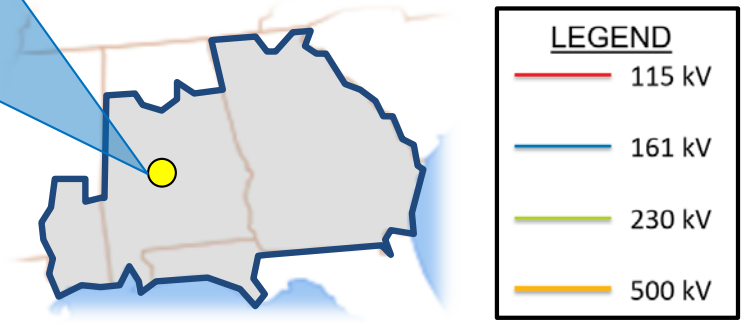


PROJECT DESCRIPTION:

1. Reconductor approximately 24 miles of 397 ACSR with 795 ACSS at 200°C.

SUPPORTING STATEMENT:

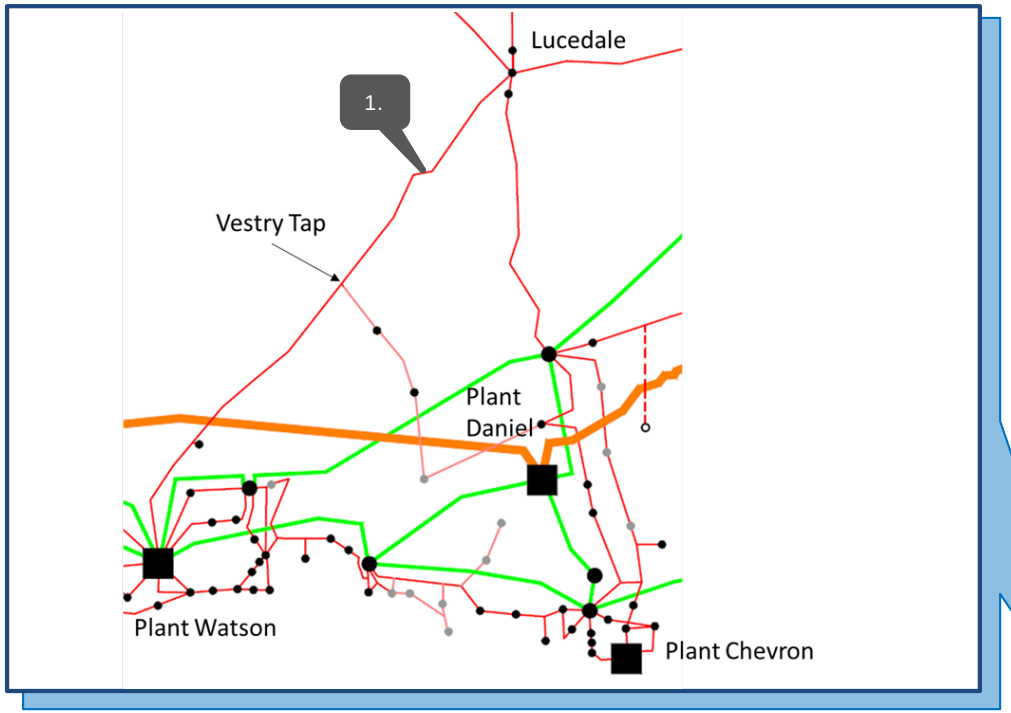
- The Jordan Dam – North Selma 115 kV transmission line overloads under contingency. This project also provides additional operational and maintenance flexibility which then increases reliability.



SOUTHERN – 11W

- **2024**

LUCEDALE – PLANT WATSON 115 KV TL

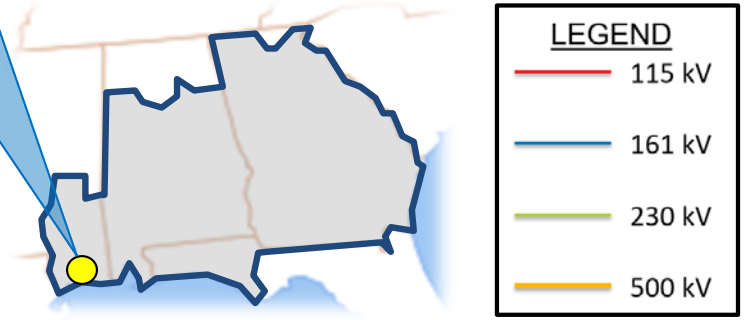


PROJECT DESCRIPTION:

1. Reconductor approximately 18 miles of 397 ACSR with 795 ACSR at 100°C.

SUPPORTING STATEMENT:

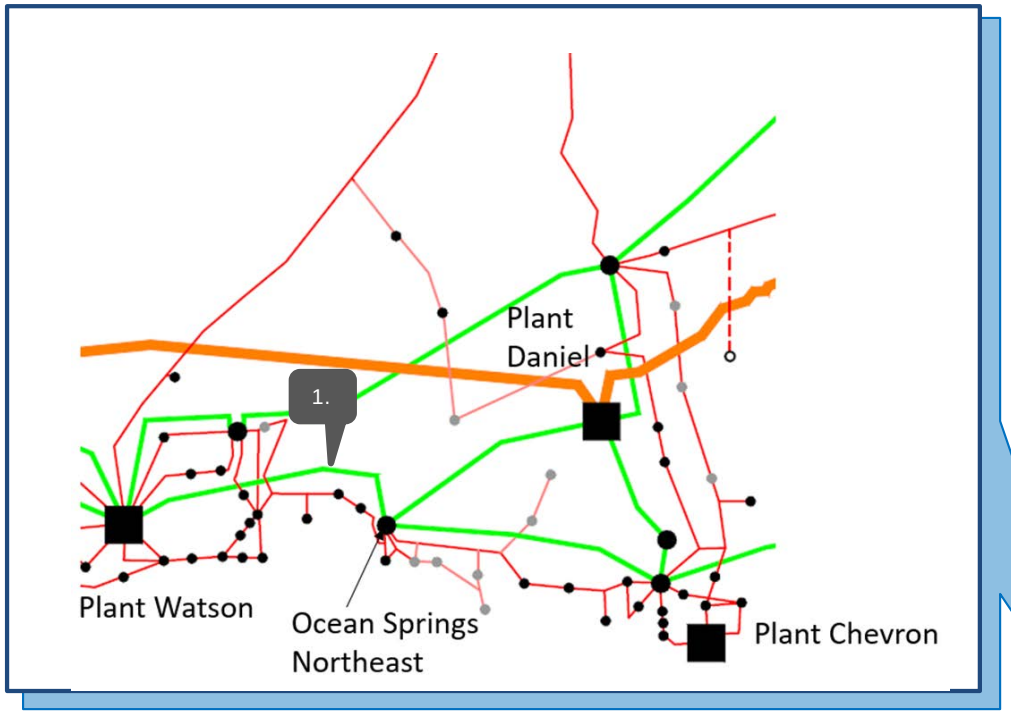
- The Lucedale – Vestry Tap 115 kV transmission line segment of the Lucedale – Watson 115 kV line overloads under contingency. This project also provides additional operational and maintenance flexibility which then increases reliability.



SOUTHERN – 12W

- **2024**

OCEAN SPRINGS NORTHEAST – PLANT WATSON 230 KV TL

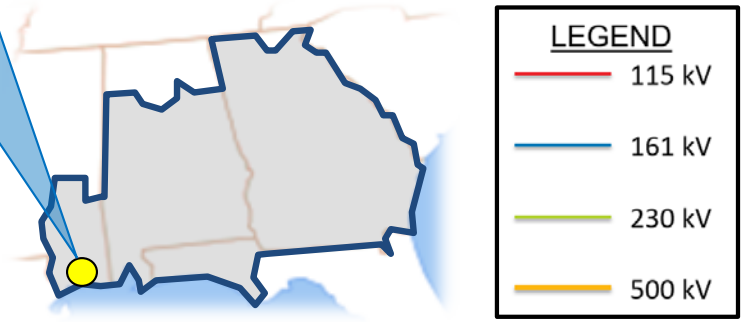


PROJECT DESCRIPTION:

1. Reconductor approximately 18 miles of 1351.5 ACSR at 100°C with 1351.5 ACSS at 200°C.

SUPPORTING STATEMENT:

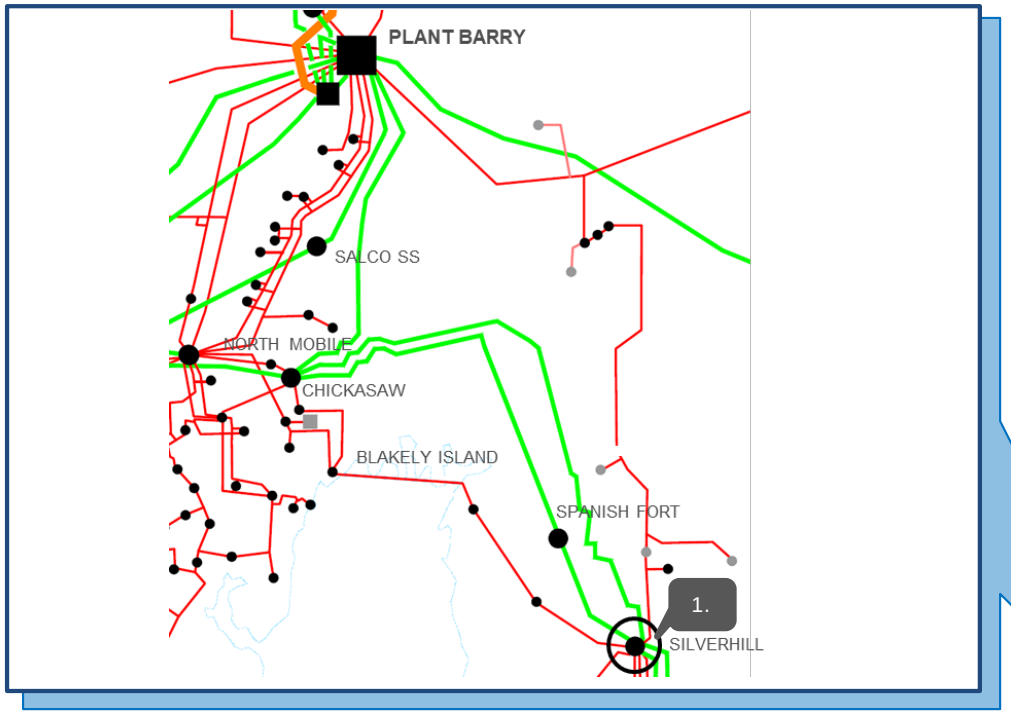
- The Ocean Springs – Plant Watson 230 kV transmission line overloads under contingency. This project also provides additional operational and maintenance flexibility which then increases reliability.



SOUTHERN – 13W

- **2025**

Silverhill TS 3rd 230/115 kV Autobank

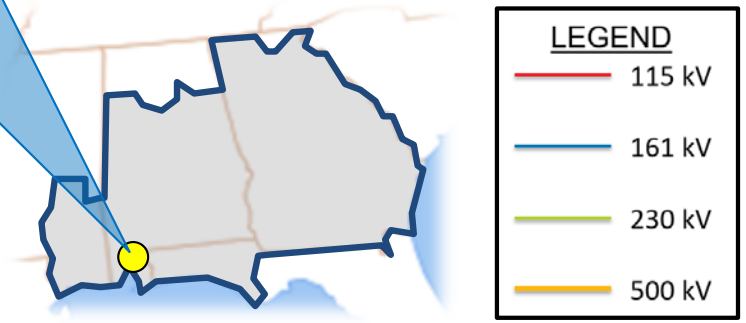


PROJECT DESCRIPTION:

1. Add 3rd autobank at Silverhill TS

SUPPORTING STATEMENT:

- The existing autobanks overload under contingency. This project also provides additional operational and maintenance flexibility which then increases reliability.



SOUTHERN Balancing Authority Area

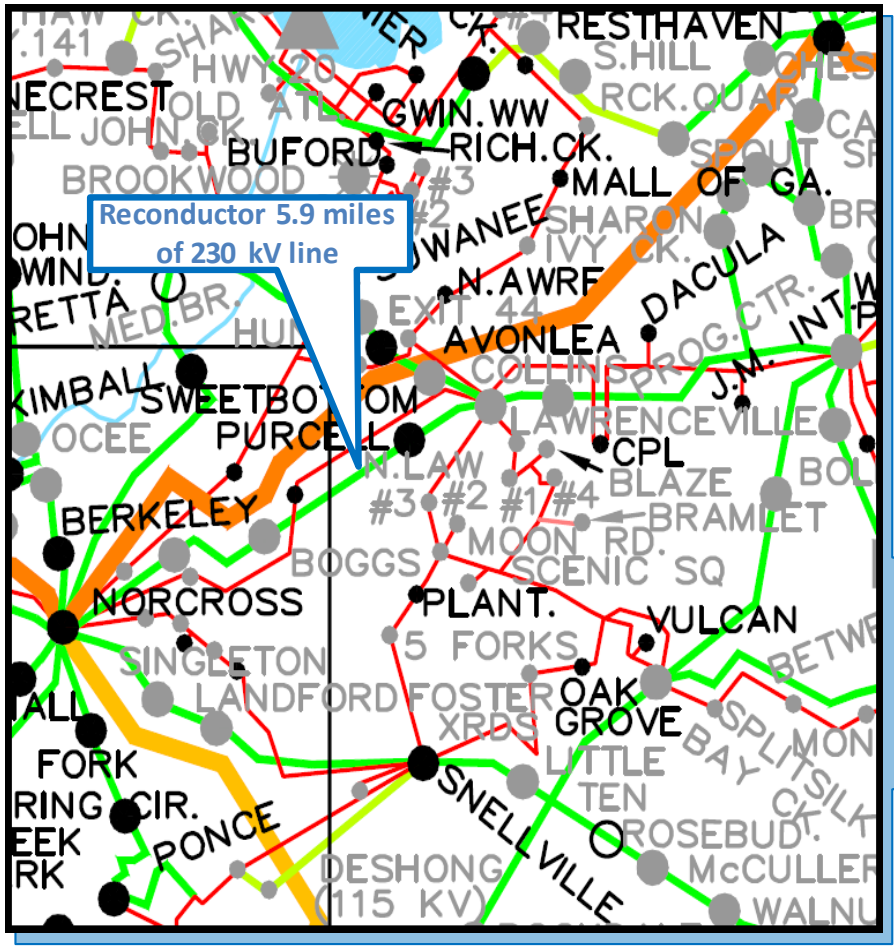
SOUTHERN (EAST) Balancing Authority Area

SERTP Regional Transmission Expansion Plan

SOUTHERN – 1E

- **2021**

LAWRENCEVILLE – NORCROSS 230 KV TRANSMISSION LINE

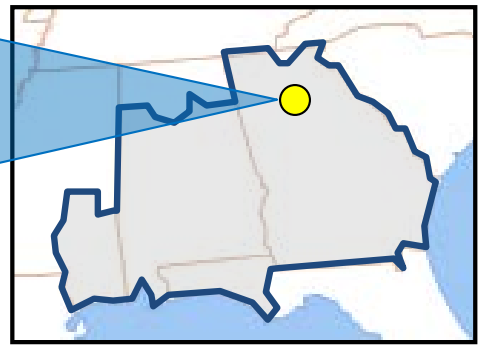


DESCRIPTION:

- Reconductor approximately 5.9 miles (the Boggs Road – Lawrenceville section) of the Lawrenceville – Norcross 230 kV transmission line with 1351 ACSS at 170°C.

SUPPORTING STATEMENT:

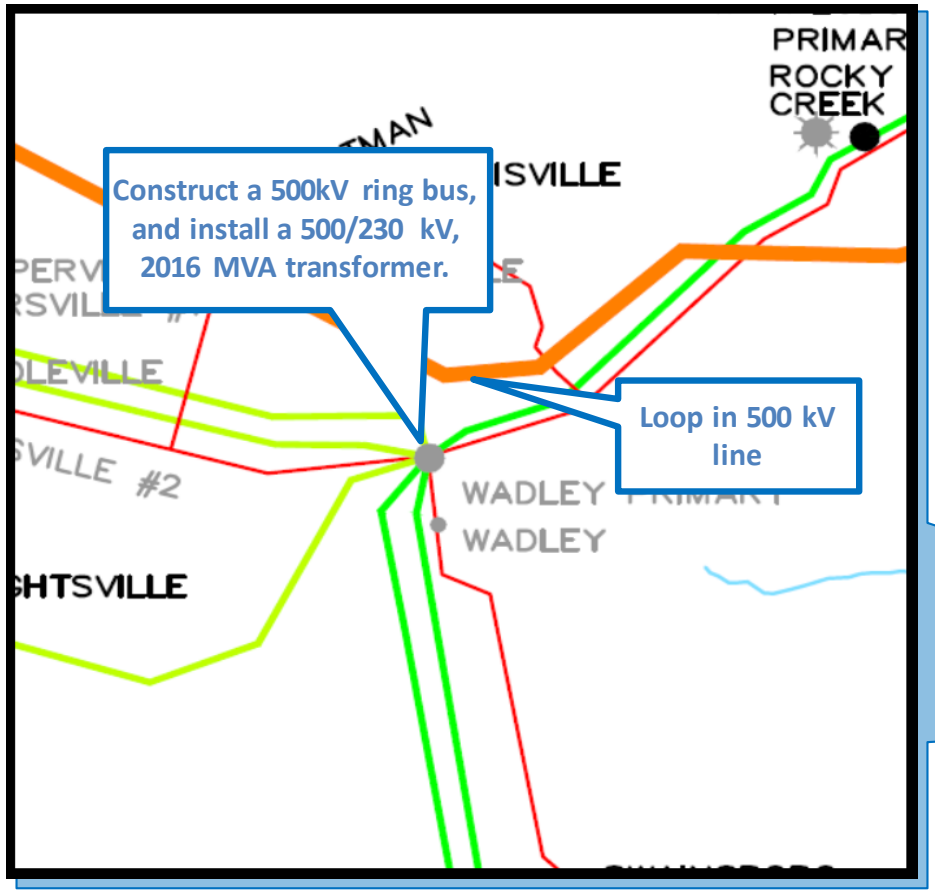
- The Lawrenceville - Norcross 230 kV transmission line overloads under contingency.



SOUTHERN – 2E

- **2021**

WADLEY PRIMARY 500/230 KV PROJECT

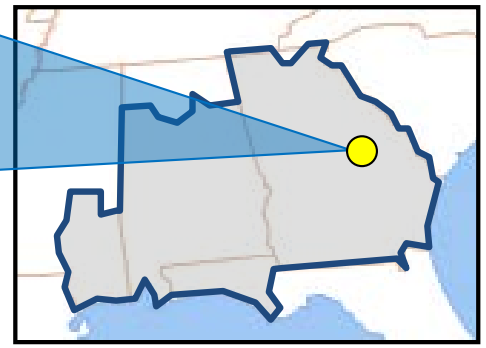


DESCRIPTION:

- MEAG: Construct a new 500 kV ring bus and install a 500/230 kV, 2016 MVA transformer
- GPC: Loop in the Vogtle – Warthen 500 kV line.

SUPPORTING STATEMENT:

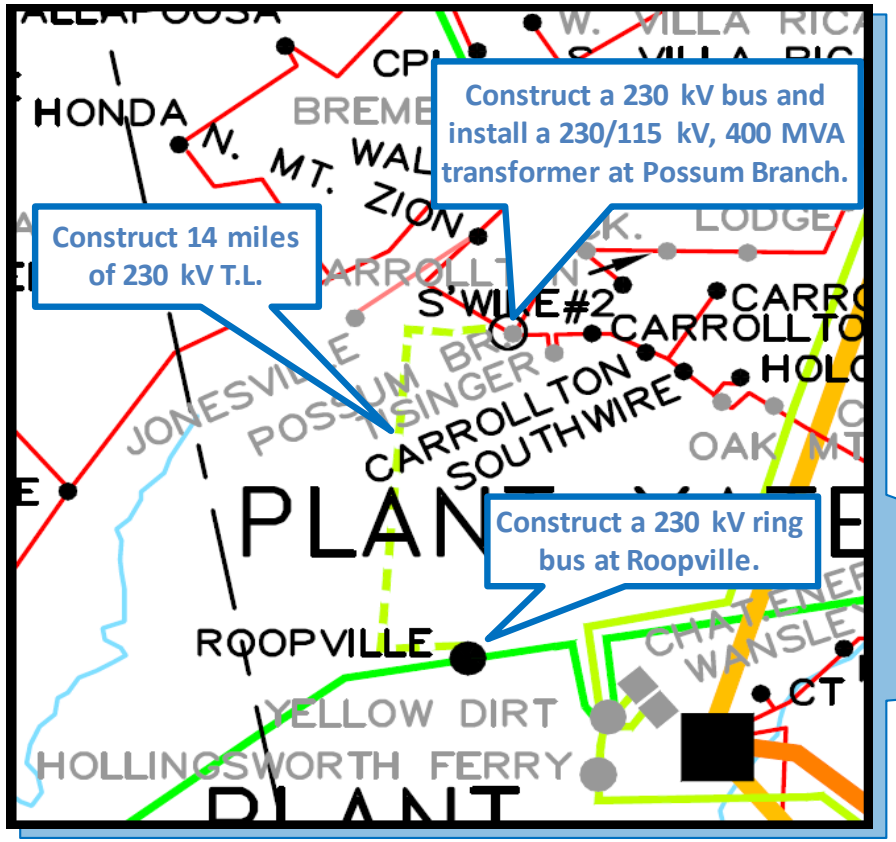
- Project to enhance reliability in the Augusta area and to support the expansion of Plant Vogtle.



SOUTHERN – 3E

- **2022**

POSSUM BRANCH 230/115 KV PROJECT

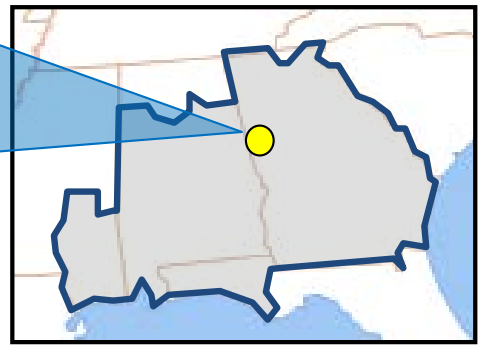


DESCRIPTION:

- GTC: Construct a new, approximately 14 mile, 1351 ACSR 230 kV line at 100°C from Possum Branch to Roopville. Install a 230/115 kV, 400 MVA transformer at Possum Branch.
- GPC: Construct a 230 kV ring bus switching station at Roopville.

SUPPORTING STATEMENT:

- Project is necessary to facilitate planned maintenance in the Bremen area.

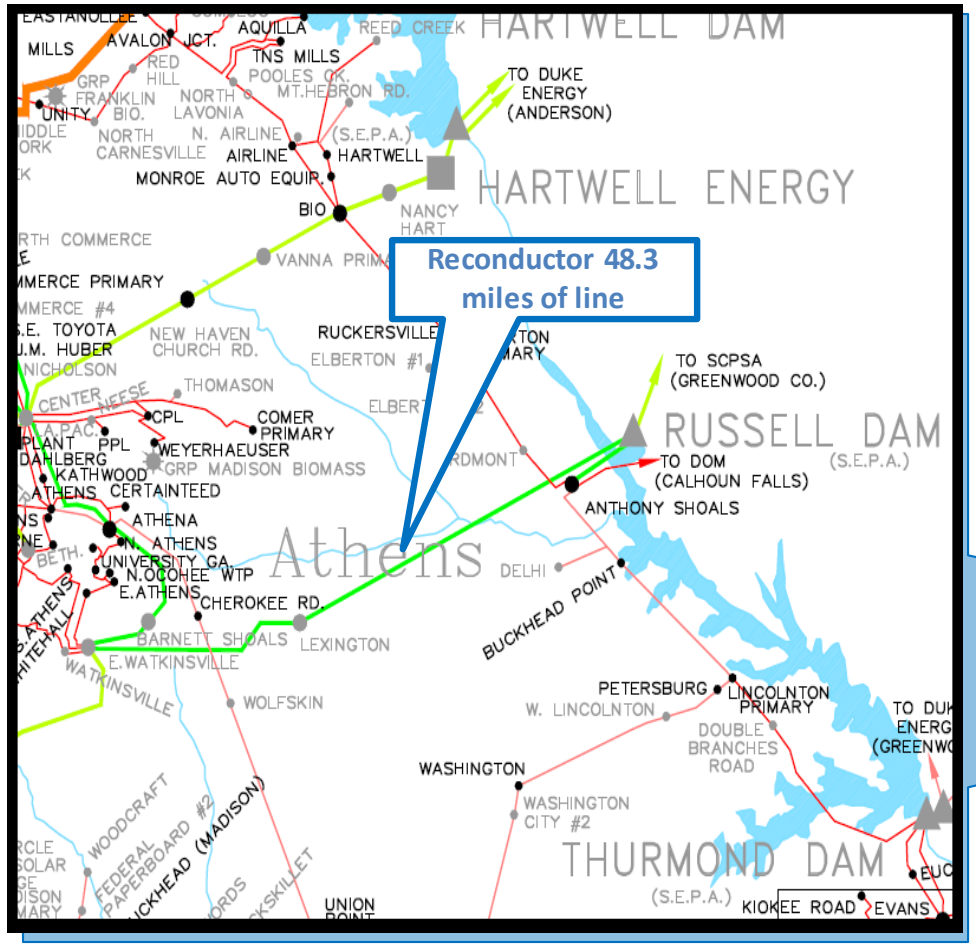


SOUTHERN Balancing Authority Area

SOUTHERN – 4E

- **2023**

EAST WATKINSVILLE - RUSSELL DAM 230 KV TRANSMISSION LINE

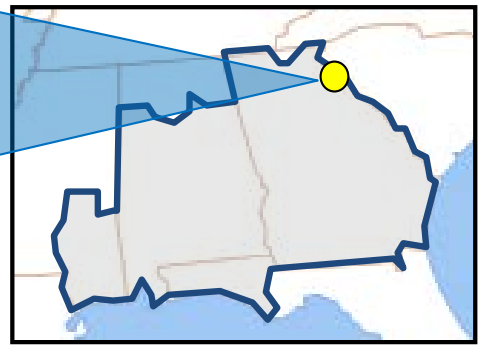


DESCRIPTION:

- Reconductor approximately 48.3 miles of 100°C 1351.5 ACSR/SD conductor with 200°C 1351.5 ACCR conductor. Replace the overhead ground wire.

SUPPORTING STATEMENT:

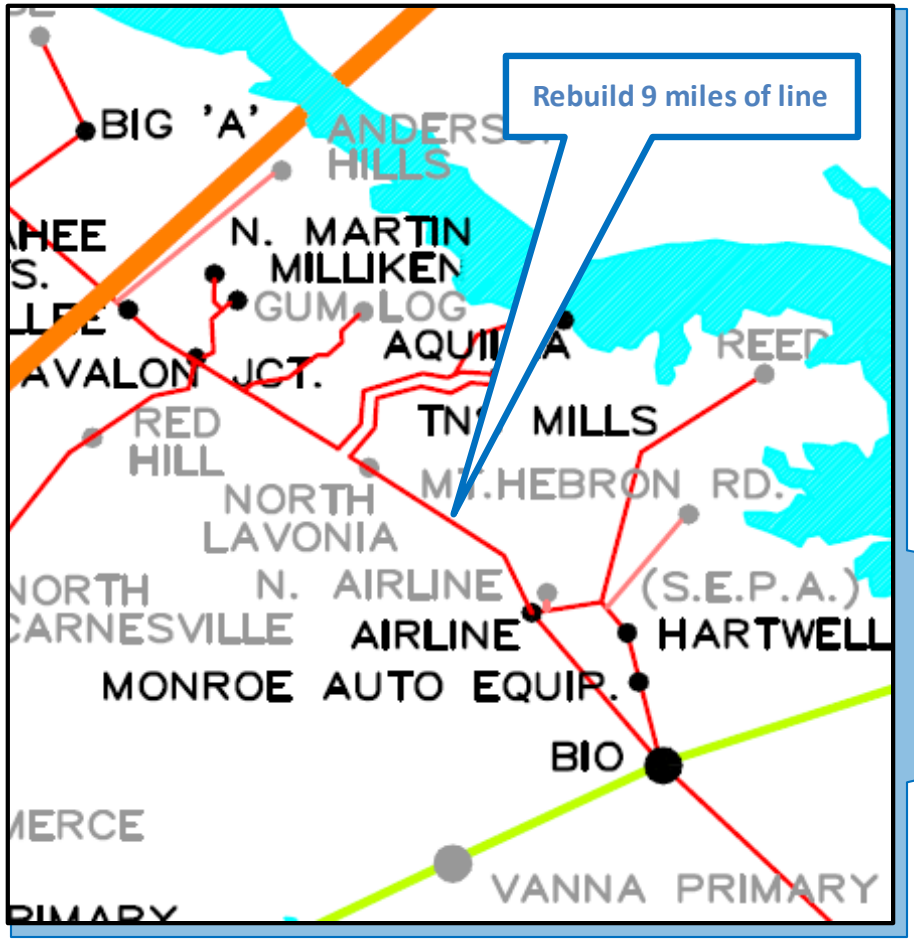
- The existing self-damping conductor has reached the end of its service life. Also, the existing rating is exceeded under contingency in import scenarios.



SOUTHERN – 5E

- **2024**

AVALON JUNCTION – BIO 115 KV TRANSMISSION LINE

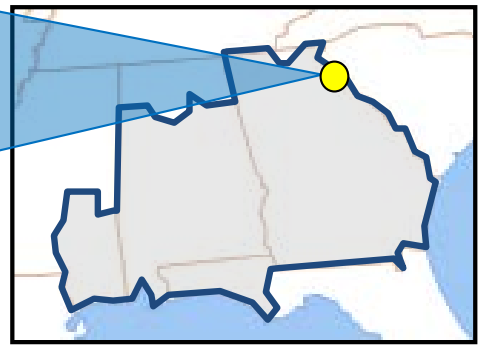


DESCRIPTION:

- Rebuild approximately 9 miles constructed at 636 ACSR/795 ACSR with 100°C 1351 ACSR. Replace the terminal equipment at various substations.

SUPPORTING STATEMENT:

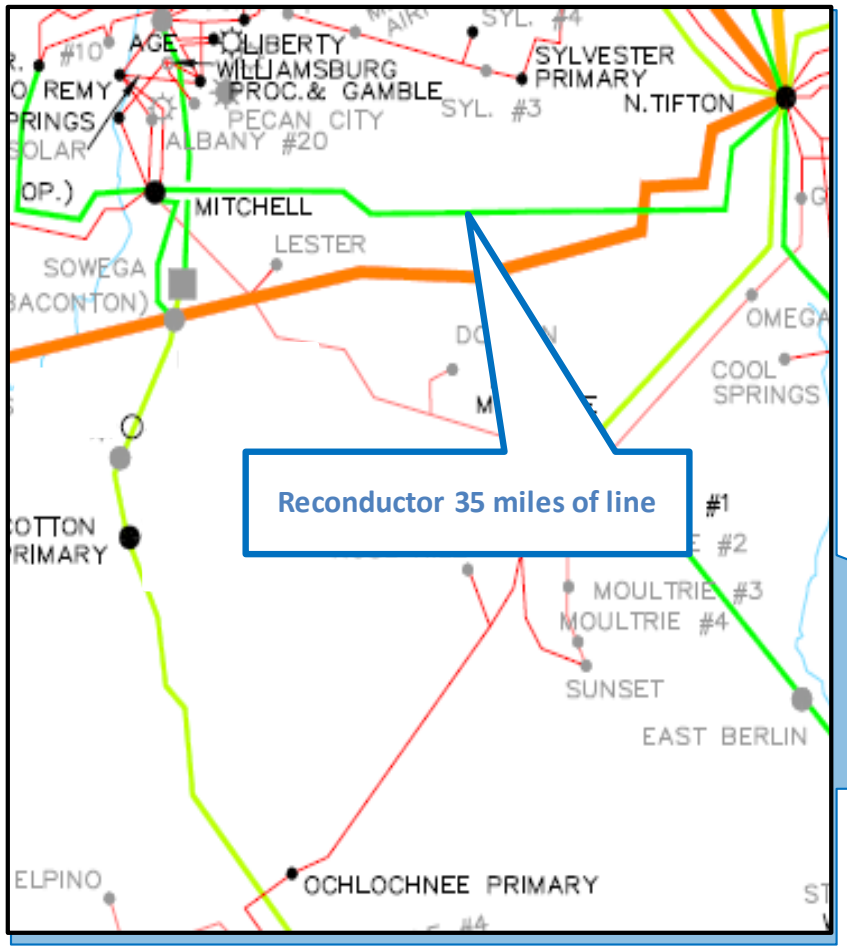
- The Avalon Junction - Bio 115 kV transmission line overloads under contingency in import scenarios.



SOUTHERN – 6E

- **2026**

MITCHELL - NORTH TIFTON 230KV TRANSMISSION LINE

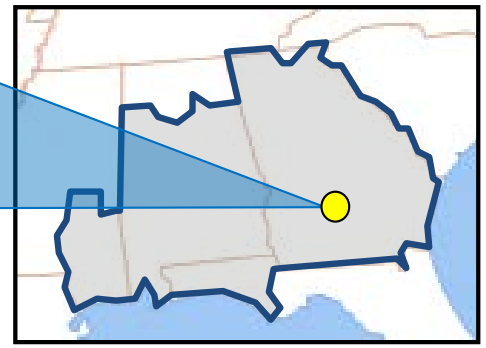


DESCRIPTION:

- Reconductor approximately 35 miles of 795 ACSR with 1033 ACSR conductor.

SUPPORTING STATEMENT:

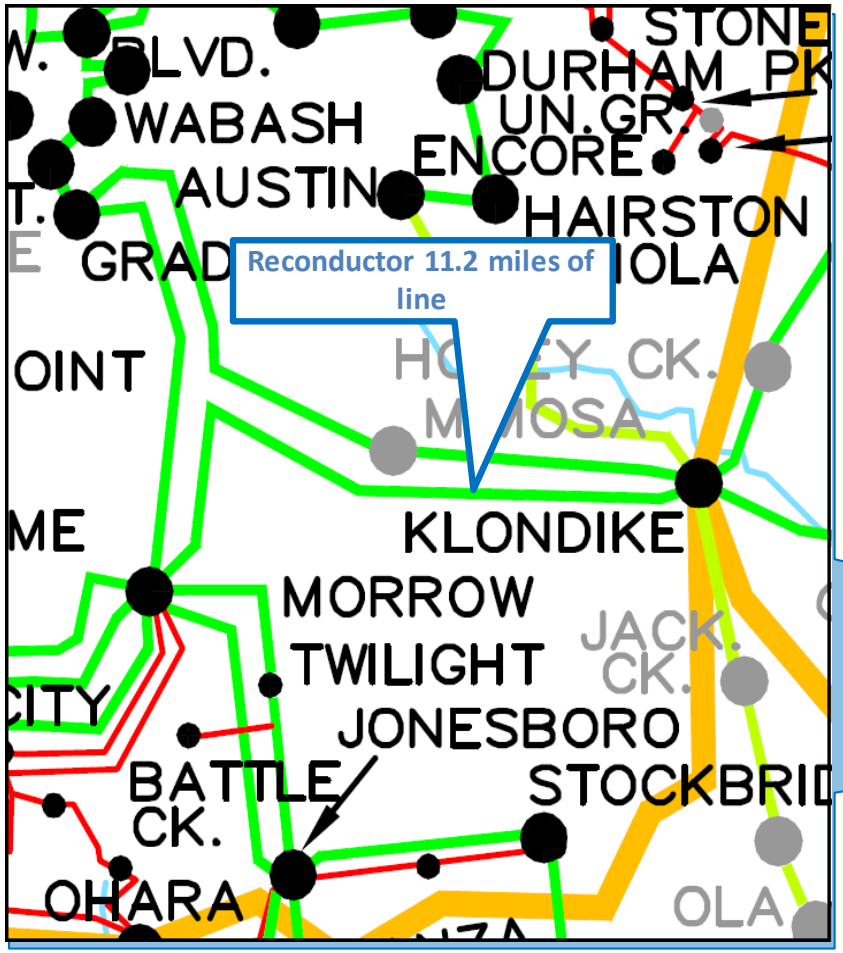
- The Mitchell-North Tifton 230kV line overloads under contingency.



SOUTHERN – 7E

- **2027**

KLONDIKE - MORROW 230 KV TRANSMISSION LINE

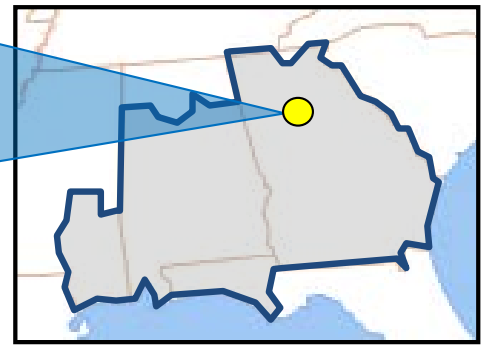


DESCRIPTION:

- Reconductor approximately 11.2 miles of 1351 ACSR with 2-795 ACSR conductors. Replace terminal equipment at both substations.

SUPPORTING STATEMENT:

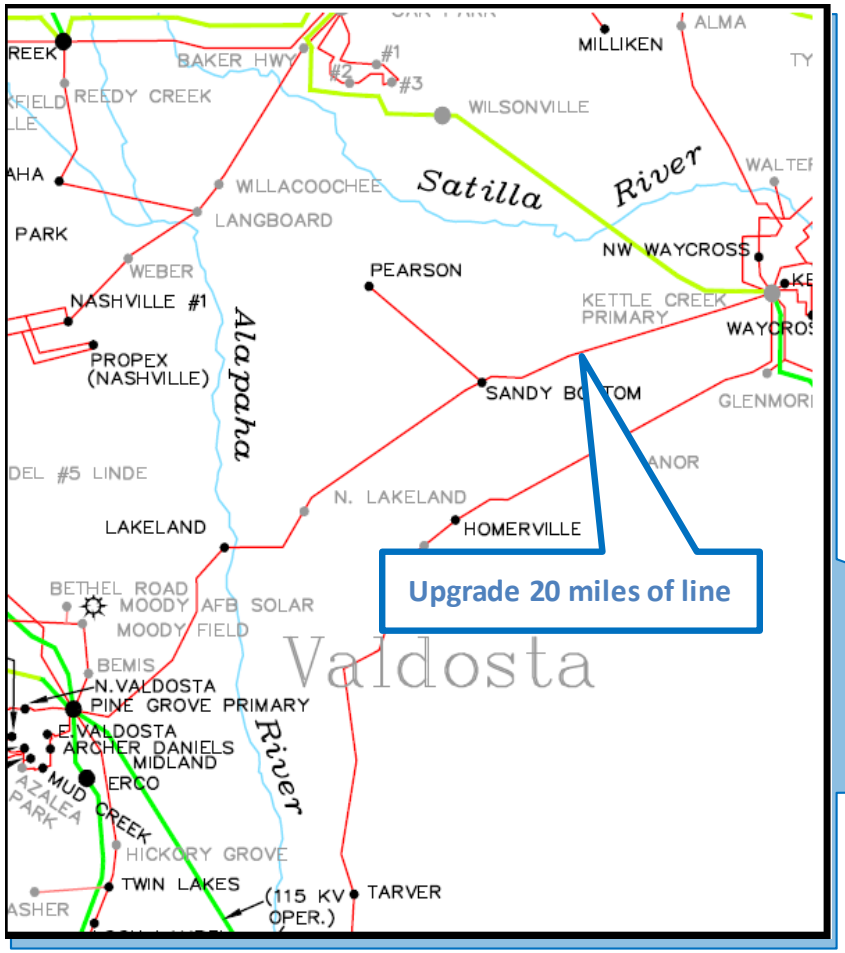
- The Klondike - Morrow 230 kV transmission line overloads under contingency.



SOUTHERN – 8E

- **2029**

KETTLE CREEK PRIMARY– PINE GROVE PRIMARY 115 KV TRANSMISSION LINE

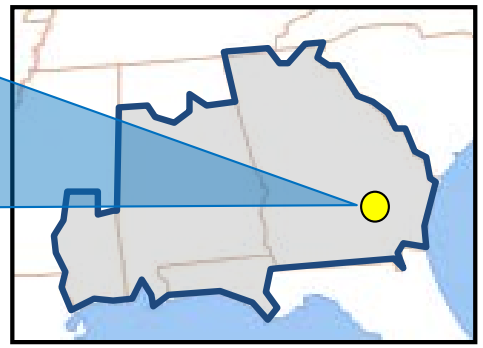


DESCRIPTION:

- Upgrade approximately 20 miles of 4/0 ACSR Penguin conductor along the Kettle Creek Primary – Pine Grove Primary 115 kV line from 50°C operation to 75°C operation.

SUPPORTING STATEMENT:

- The Kettle Creek Primary – Pine Grove 115 kV transmission line overloads under contingency.



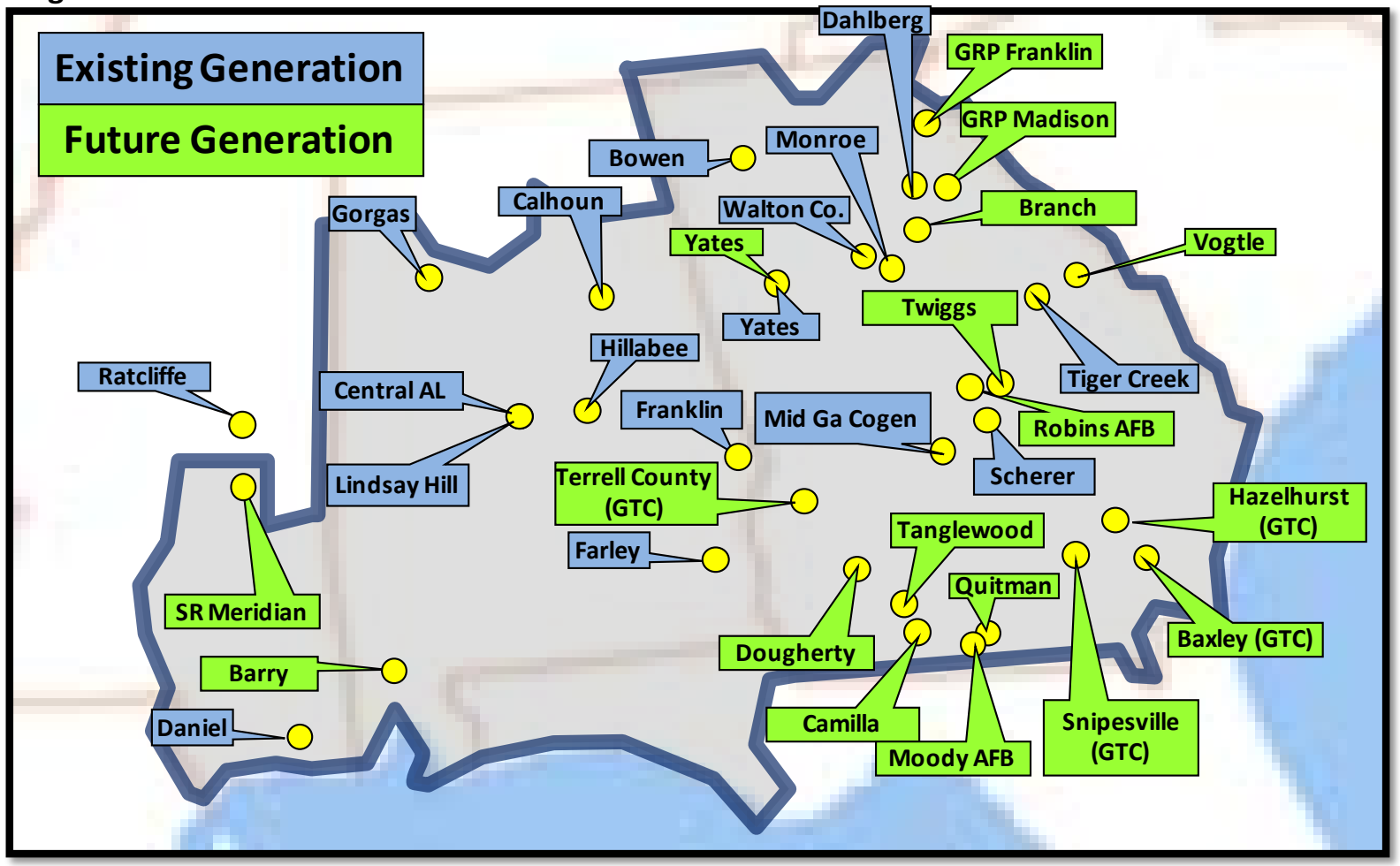
SOUTHERN Balancing Authority Area

SOUTHERN Balancing Authority Area

2021 Upcoming Generation Assumptions

SOUTHERN – Generation Assumptions

The following diagram depicts the location of generation assumptions that change throughout the ten year planning horizon for the 2021 SERTP Process.



Southern Company – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2021 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
CALHOUN 1-4	Gas	632	632	0	--	--	--	--	--	--	--
DAHLBERG 2, 6, 8, 10	Gas	298	298	298	298	0	--	--	--	--	--
MID GA COGEN	Gas	300	300	300	300	300	300	300	0	--	--
MONROE POWER	Gas	309	309	309	0	--	--	--	--	--	--
TIGER CREEK 1&4	Gas	313	313	0	--	--	--	--	--	--	--
WALTON COUNTY	Gas	465	465	0	--	--	--	--	--	--	--

Southern Company – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2021 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
BARRY[1]	Gas	--	--	--	685	685	685	685	685	685	685
GASTON 1-4	Gas	465	465	465	515	515	515	515	515	515	515
YATES 6-7	Gas	649	649	649	714	714	714	714	714	714	714
FARLEY 1	Nuclear	898	898	898	898	898	898	898	898	898	898
FARLEY 2	Nuclear	901	901	901	901	901	901	901	901	901	901
VOGTLE 3	Nuclear	504	504	504	504	504	504	504	504	504	504
VOGTLE 4	Nuclear	--	504	504	504	504	504	504	504	504	504
QUITMAN 2	Solar	--	150	150	150	150	150	150	150	150	150
COOL SPRINGS	Solar	--	213	213	213	213	213	213	213	213	213
BROKEN SPOKE	Solar	--	195	195	195	195	195	195	195	195	195

(1) This assumption may be modified as resource decisions are made by the corresponding LSEs pursuant to applicable regulatory processes.

SOUTHERN Balancing Authority Area

SOUTHERN COMPANY – 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
BOWEN	159	159	159	159	159	159	159	159	159	159
CENTRAL ALABAMA	885	885	890	890	890	890	890	890	890	890
DAHLBERG	494	494	494	494	494	494	494	494	494	494
DANIEL	650	650	650	600	600	600	600	600	600	600
HARRIS 2	250	235	306	71	71	71	0	0	0	0
HILLABEE	350	350	350	350	350	350	350	350	350	350
LINDSAY HILL	300	300	300	300	300	300	300	300	300	300
SCHERER	1131	1131	1070	1070	1070	1070	1070	1070	1070	1070
VOGTLE	206	206	206	206	206	206	206	206	206	206

GTC – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2021 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
SANDHILLS	SOLAR	143	143	143	143	143	143	143	143	143	143
BAXLEY	SOLAR	25	25	25	25	25	25	25	25	25	25
TERRELL COUNTY	SOLAR	74	74	74	74	74	74	74	74	74	74
SR LUMPKIN	SOLAR	--	--	100	100	100	100	100	100	100	100
LANCASTER	SOLAR	--	80	80	80	80	80	80	80	80	80
ODOM	SOLAR	20	20	20	20	20	20	20	20	20	20
VOGTLE 3	NUCLEAR	330	330	330	330	330	330	330	330	330	330
VOGTLE 4	NUCLEAR	--	330	330	330	330	330	330	330	330	330

GTC – Generation Assumptions Cont.

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2021 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
SNIPESVILLE 1	SOLAR	86	86	86	86	86	86	86	86	86	86
SNIPESVILLE 2	SOLAR	--	107	107	107	107	107	107	107	107	107
SR DESOTO	SOLAR	--	250	250	250	250	250	250	250	250	250
SR PERRY	SOLAR	--	68	68	68	68	68	68	68	68	68

MEAG – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2021 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
VOGTLE 3	NUCLEAR	250	250	250	250	250	250	250	250	250	250
VOGTLE 4	NUCLEAR	--	250	250	250	250	250	250	250	250	250

DALTON – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2021 SERTP Process. The years shown represent Summer Peak conditions.

SITE	FUEL TYPE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
VOGTLE 3	NUCLEAR	19	19	19	19	19	19	19	19	19	19
VOGTLE 4	NUCLEAR	--	19	19	19	19	19	19	19	19	19

TVA Balancing Authority Area

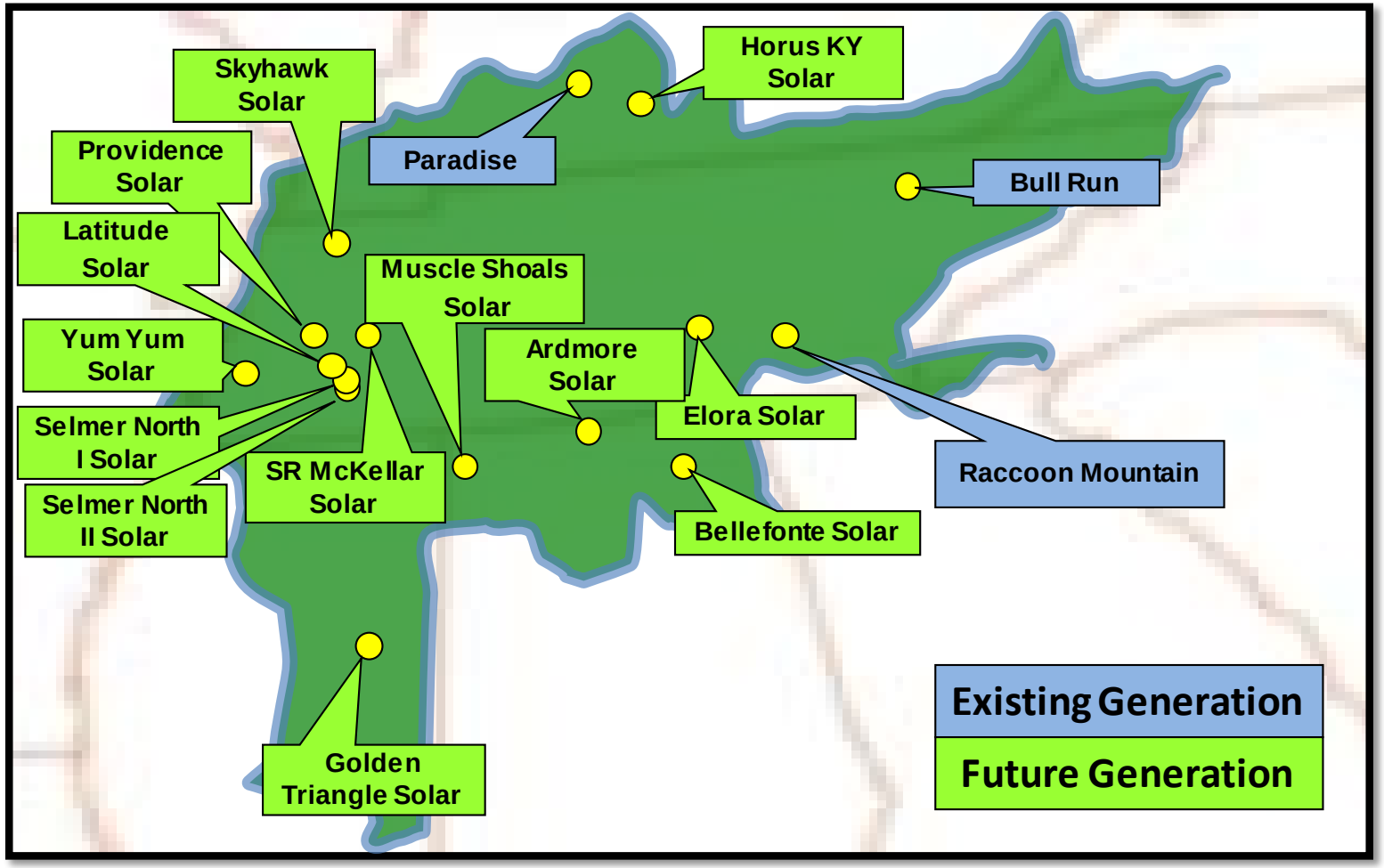
TVA Balancing Authority Area

2020 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 2020 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 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
RACOON MTN GEN 1	440	440	440	440	440	440	440	440	440	440
RACOON MTN GEN 2	440	440	440	440	440	440	440	440	440	440
RACOON MTN GEN 3	413	440	440	440	440	440	440	440	440	440
BULL RUN FP UNIT 1	925	925	925	0	--	--	--	--	--	--
PARADISE FP UNIT 3	0	--	--	--	--	--	--	--	--	--
BELLEFONTE SOLAR	--	150	150	150	150	150	150	150	150	150
ELORA SOLAR	--	150	150	150	150	150	150	150	150	150
GOLDEN TRIANGLE SOLAR	--	--	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

TVA Balancing Authority Area

TVA – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2020 SERTP Process. The years shown represent Summer Peak conditions.

SITE	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
MUSCLE SHOALS SOLAR	227	227	227	227	227	227	227	227	227	227
YUM YUM SOLAR	--	147	147	147	147	147	147	147	147	147
SKYHAWK SOLAR	--	--	100	100	100	100	100	100	100	100
SR MCKELLAR SOLAR	--	--	80	80	80	80	80	80	80	80
SELMER NORTH I SOLAR	14	14	14	14	14	14	14	14	14	14
SELMER NORTH II SOLAR	7	7	7	7	7	7	7	7	7	7
PROVIDENCE SOLAR	15	15	15	15	15	15	15	15	15	15
ARDMORE SOLAR	15	15	15	15	15	15	15	15	15	15
LATITUDE SOLAR	15	15	15	15	15	15	15	15	15	15

TVA Balancing Authority Area

TVA Balancing Authority Area

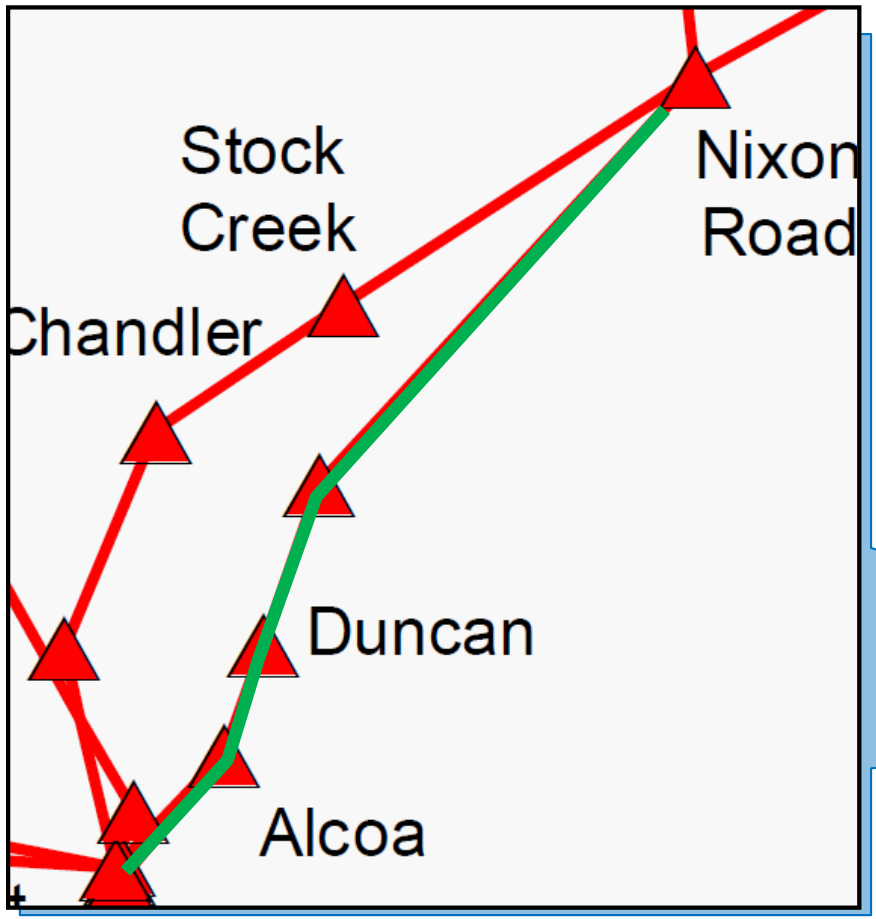
SERTP Regional Transmission Expansion Plan

TVA Balancing Authority Area

TVA – 1

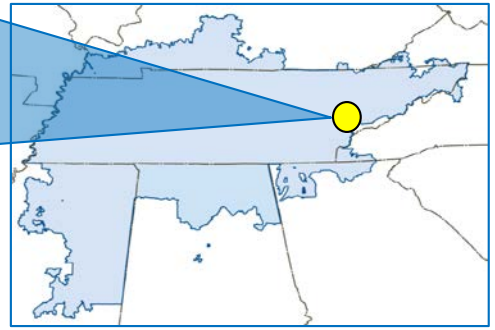
- **2021**

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.

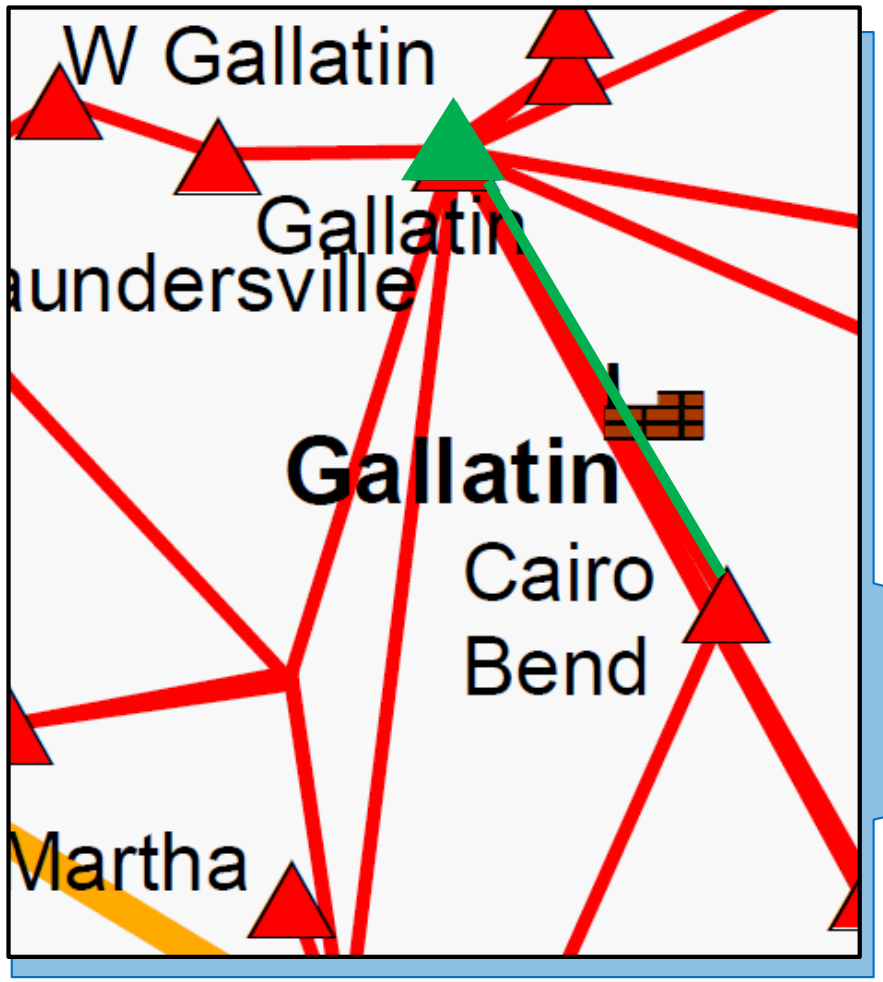


TVA Balancing Authority Area

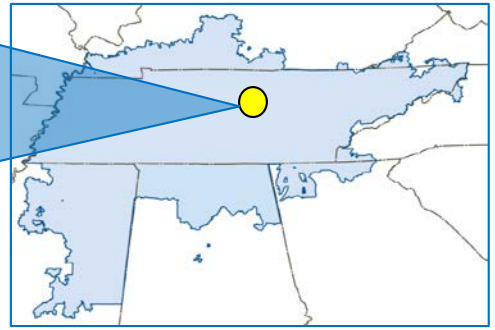
TVA – 2

- **2021**

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.

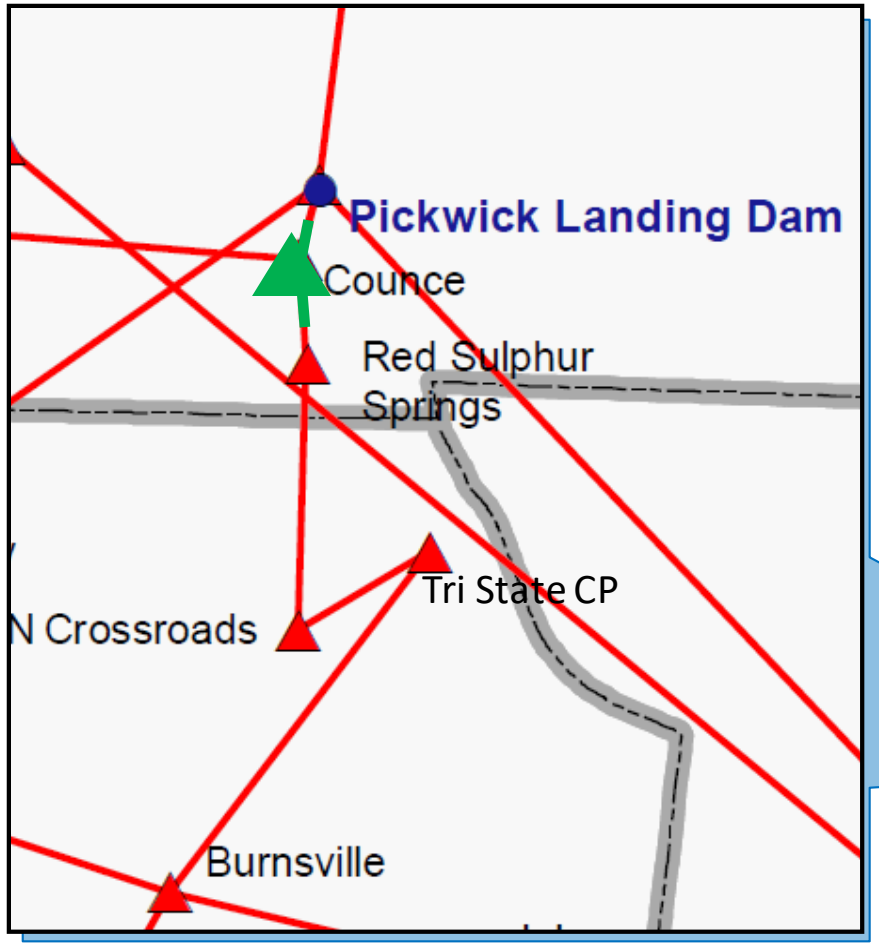


TVA Balancing Authority Area

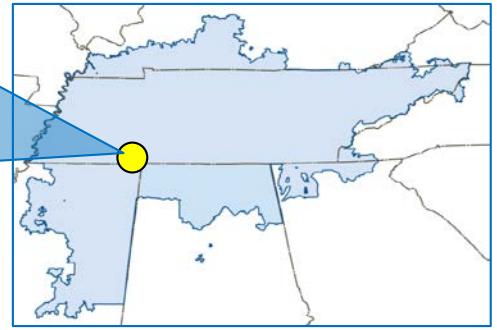
TVA – 3

- **2021**

COUNCE 161 KV SUBSTATION



- **DESCRIPTION:**
  - Convert Counce 161 kV switchyard to a double breaker arrangement. Loop the existing Pickwick to Tri State Commerce Park 161 kV transmission line into the Counce 161 kV station.
- **SUPPORTING STATEMENT:**
  - Additional voltage support is needed in the Counce, TN area under contingency.

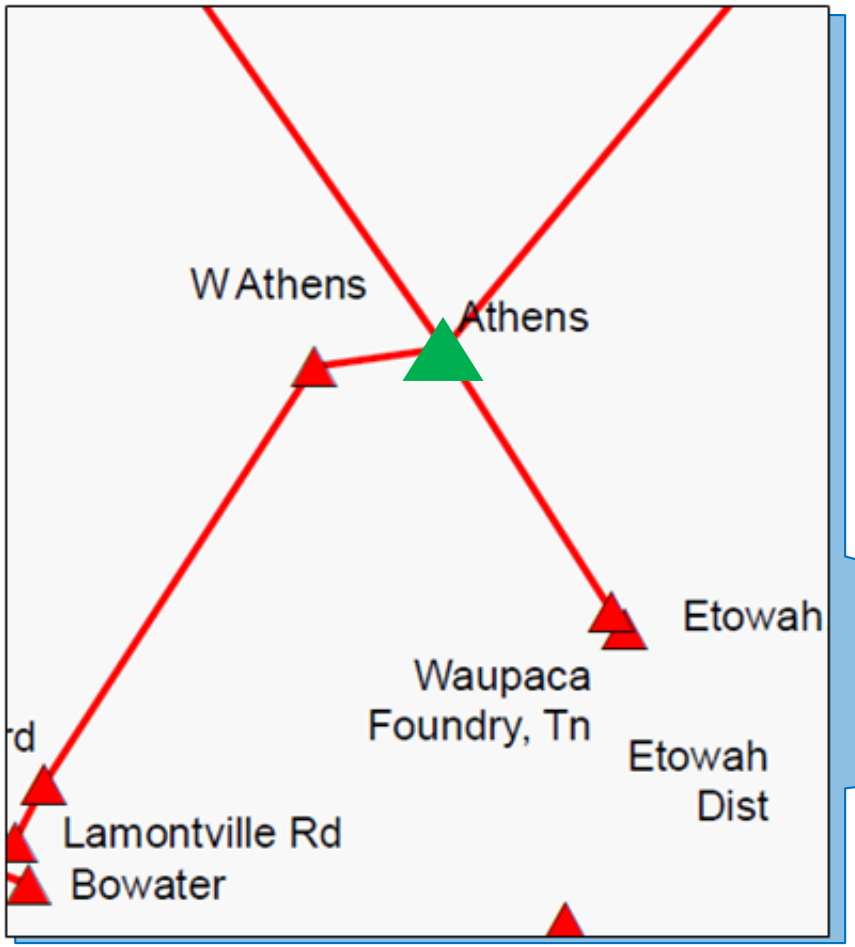


TVA Balancing Authority Area

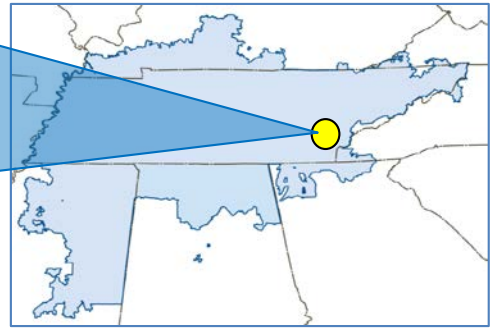
TVA – 4

- **2021**

ATHENS, TN 161KV SUBSTATION



- **DESCRIPTION:**
  - Upgrade bus work and terminal equipment at the Athens, TN 161 kV substation to 836 MVA.
- **SUPPORTING STATEMENT:**
  - The terminal equipment and bus work at Athens TN 161 kV overloads under contingency.

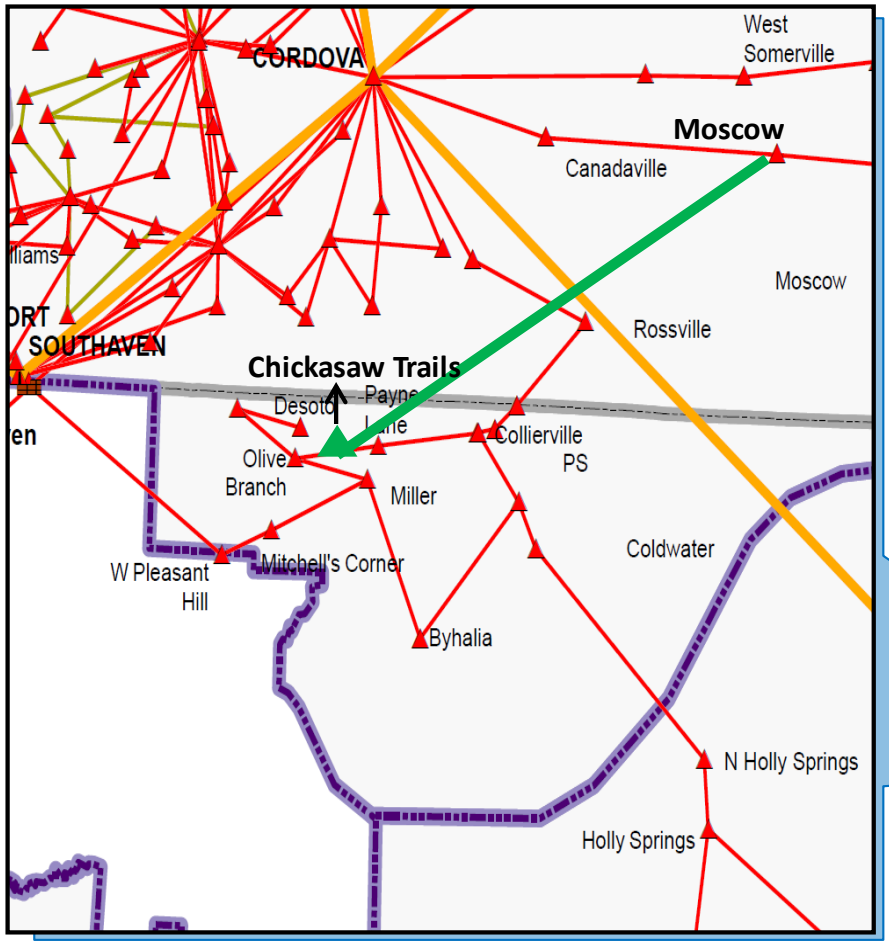


TVA Balancing Authority Area

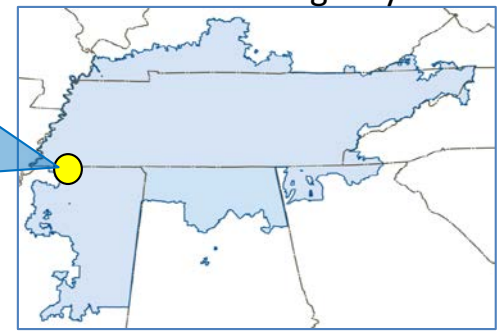
TVA – 5

- **2021**

MOSCOW – CHICKASAW TRAILS 161 KV TRANSMISSION LINE



- **DESCRIPTION:**
  - Construct the Chickasaw Trails 161 kV Substation and the Diffee 161 kV Substation. Construct approximately 17.0 miles for new Chickasaw Trails to Moscow 161 kV transmission line with 954 ACSR at 100°C. Loop existing Miller to Holly Springs 161 kV transmission line into the Chickasaw Trails Substation.
- **SUPPORTING STATEMENT:**
  - Thermal overloads occur and voltage support is needed in the Olive Branch and Chickasaw Trails area under contingency

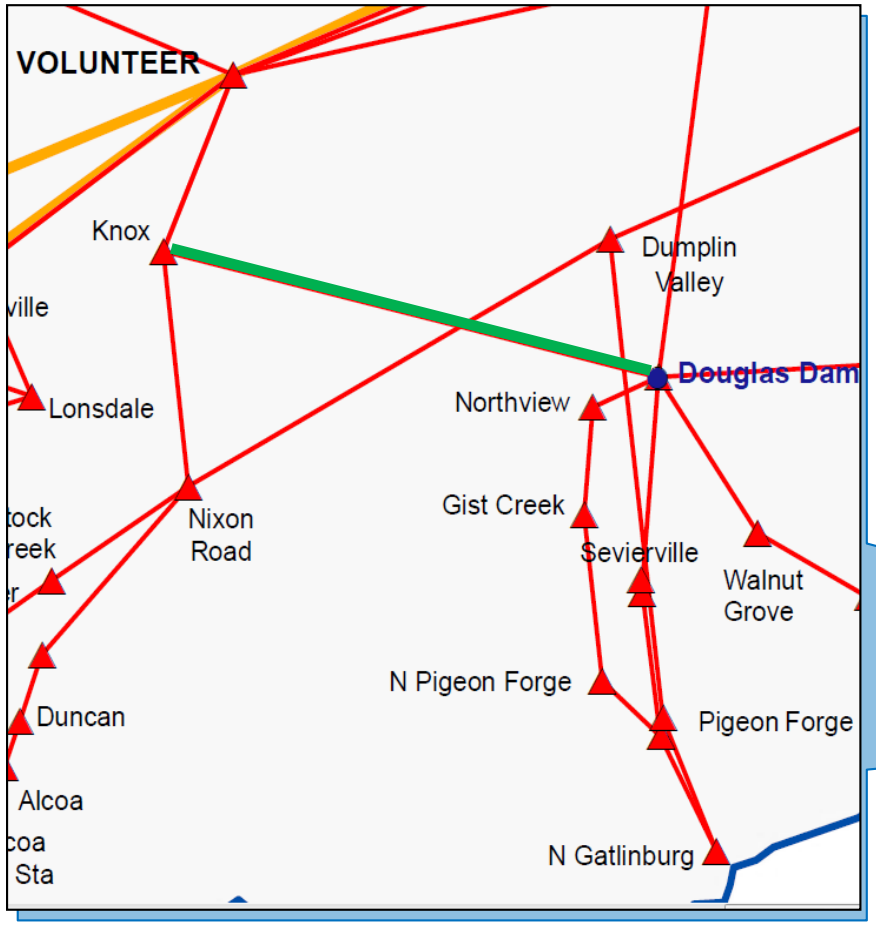


TVA Balancing Authority Area

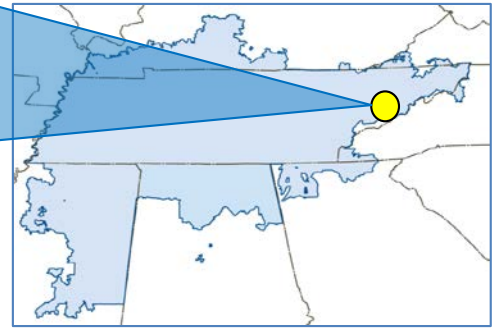
TVA – 6

- **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.

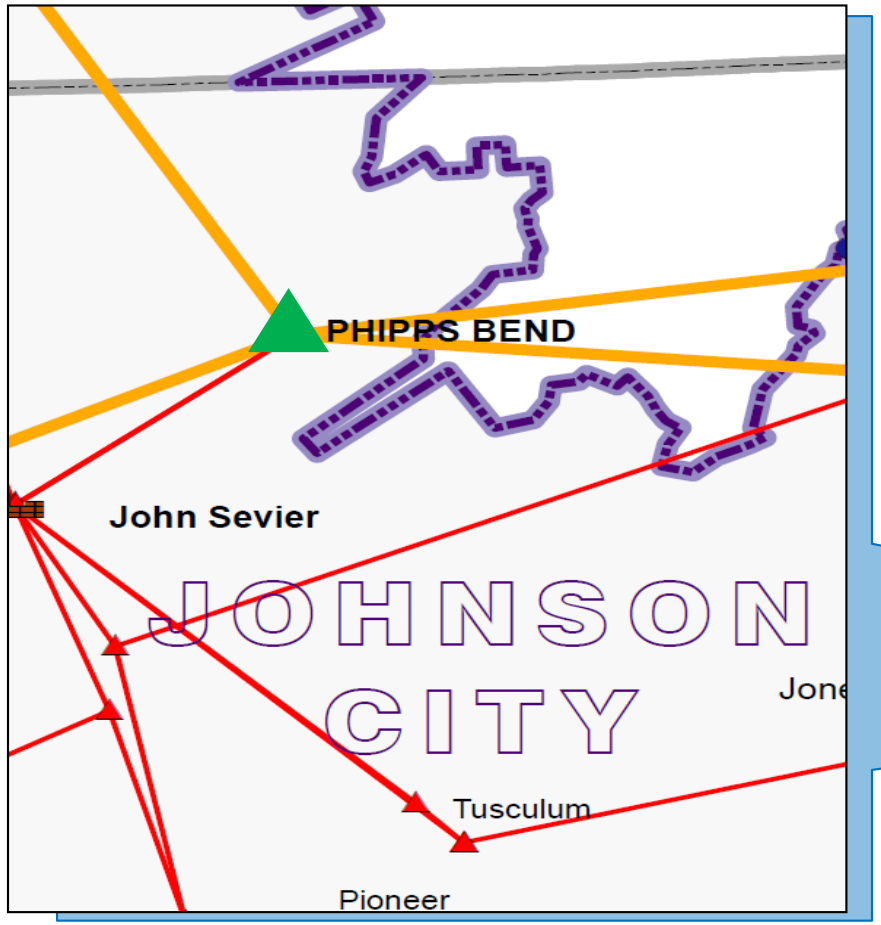


TVA Balancing Authority Area

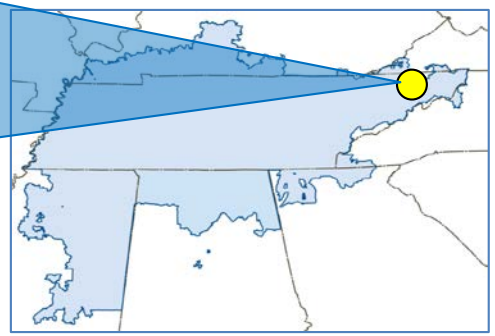
TVA – 7

- **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.

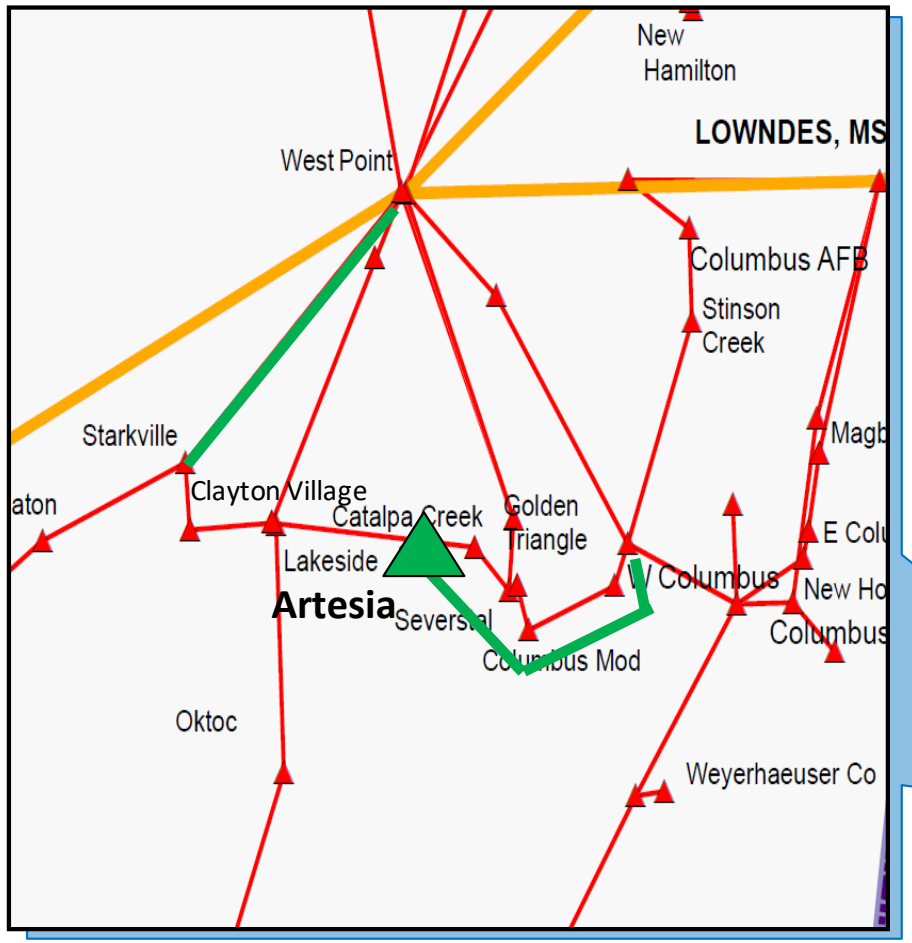


TVA Balancing Authority Area

TVA – 8

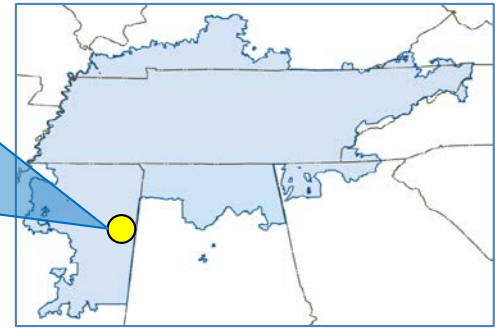
- **2022**

ARTESIA – W. COLUMBUS 161 KV TRANSMISSION LINE



- **DESCRIPTION:**
  - Construct the Artesia 161 kV Substation. Construct approximately 12.0 miles for Artesia to West Columbus with 954 ACSS at 150°C. Reconductor approximately 15.0 miles of West Point to Starkville 161 kV with 954 ACSS at 150°C.

- **SUPPORTING STATEMENT:**
  - Thermal overloads occur and voltage support is needed in the West Point and Columbus area under contingency.

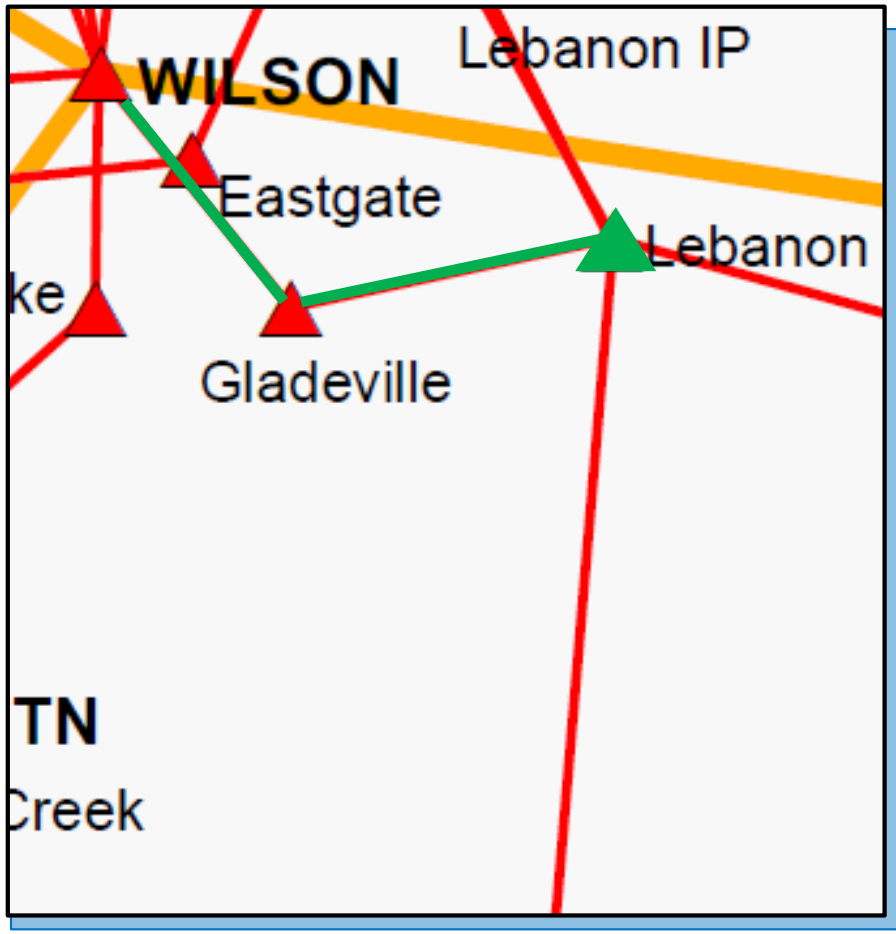


TVA Balancing Authority Area

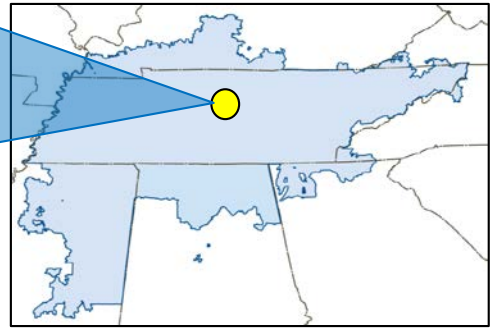
TVA – 9

- **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.

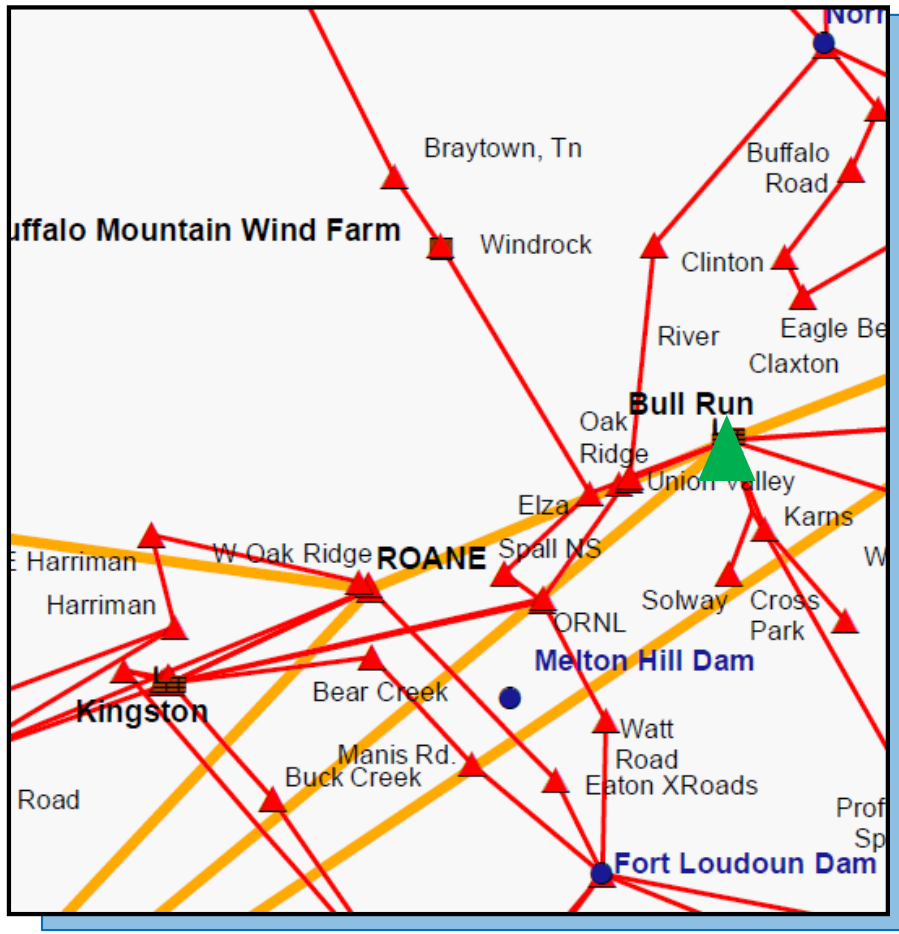


TVA Balancing Authority Area

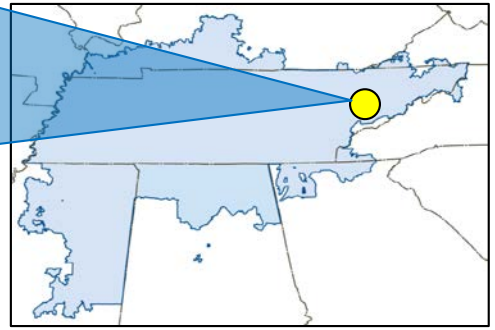
TVA – 10

- **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.

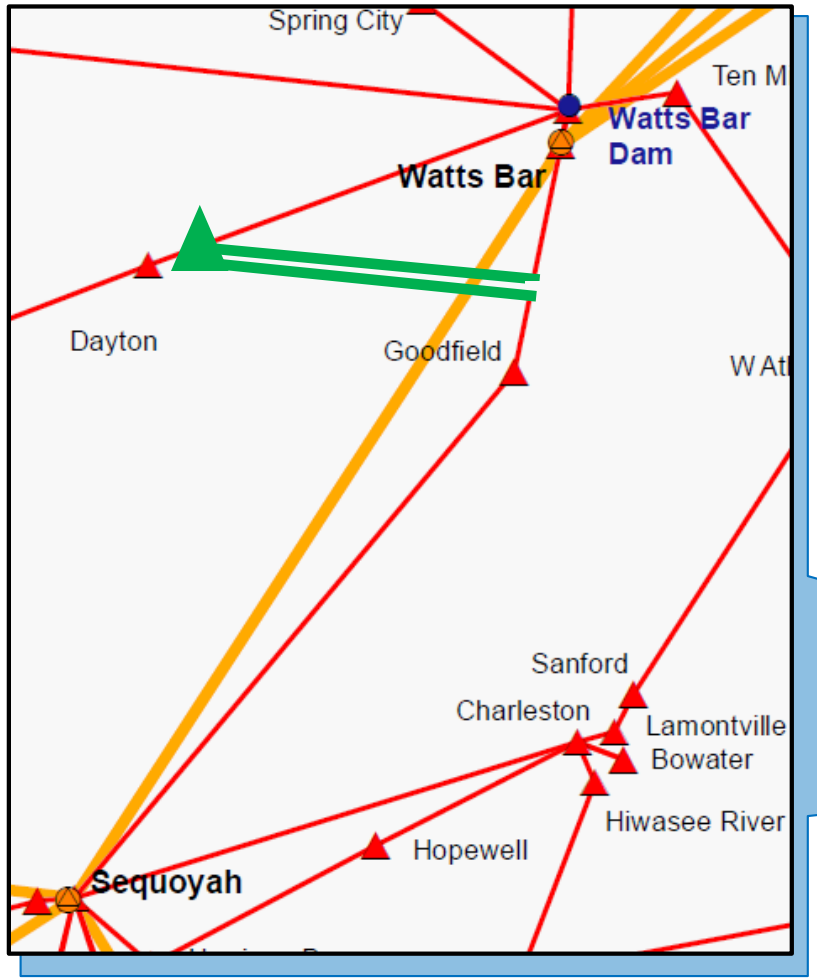


TVA Balancing Authority Area

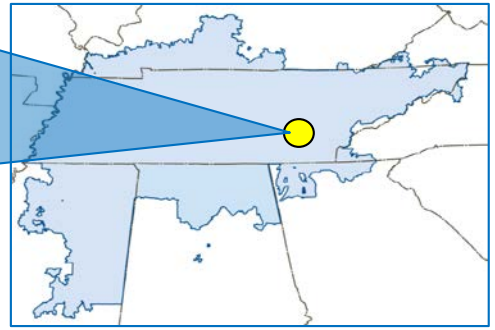
TVA – 11

- **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.

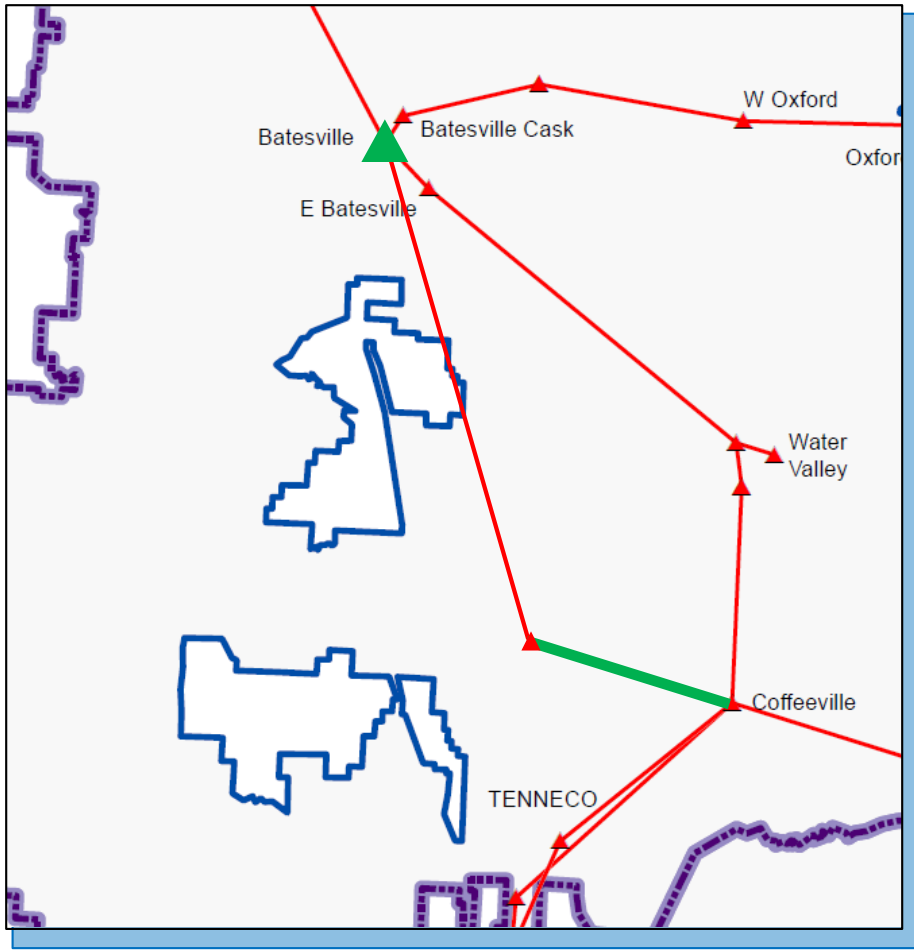


TVA Balancing Authority Area

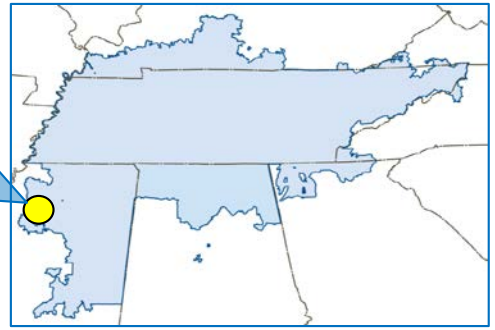
TVA – 12

- **2024**

N. OAKLAND – COFFEEVILLE 161 KV TRANSMISSION LINE



- **DESCRIPTION:**
  - Construct approximately 18.0 miles of new 161kV transmission line from North Oakland - Coffeeville using 954 at 100°C and upgrade terminal equipment to 472 MVA at Batesville 161 kV.
- **SUPPORTING STATEMENT:**
  - Multiple 161 kV transmission lines overload under contingency.



TVA Balancing Authority Area

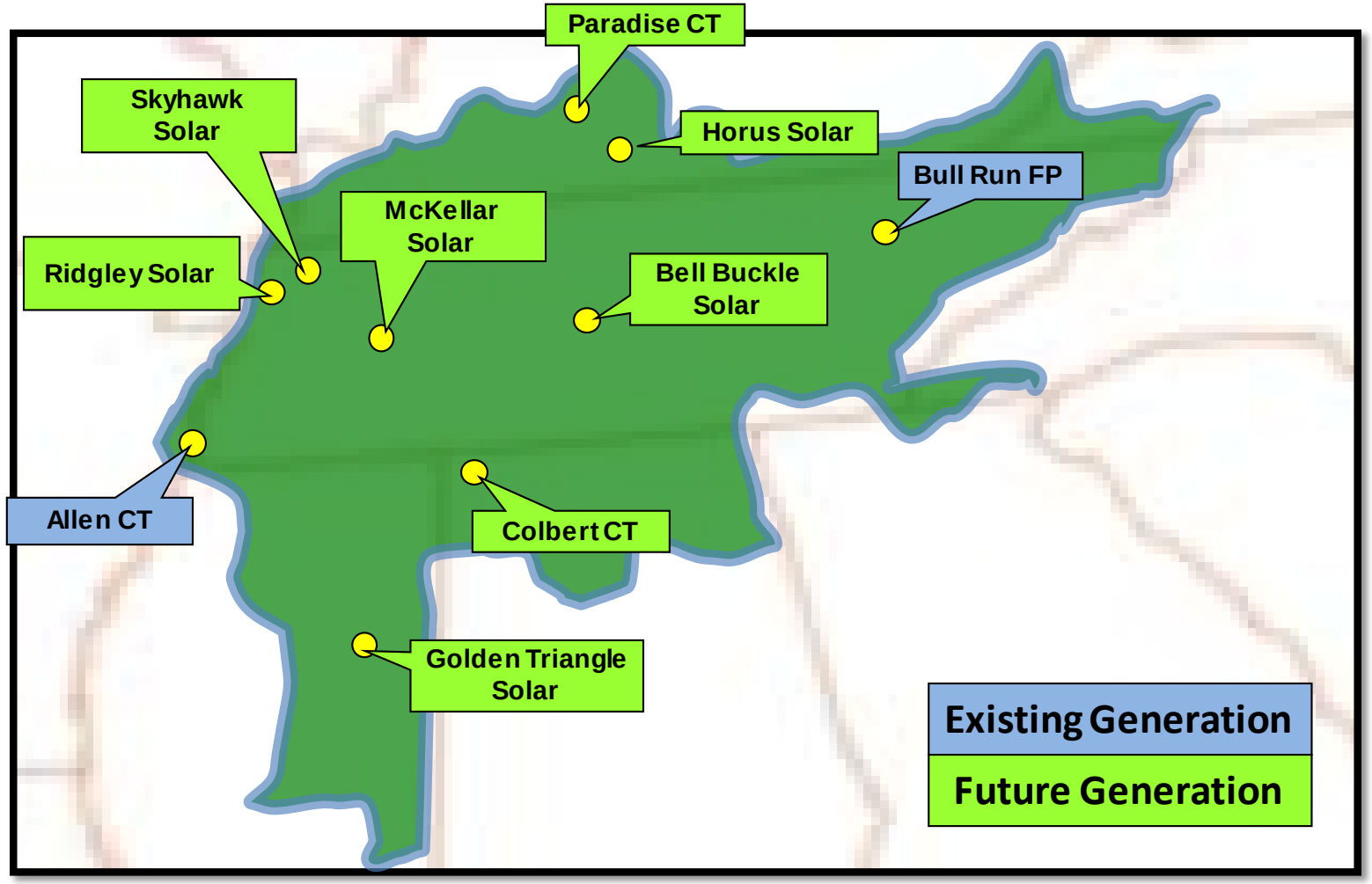
TVA Balancing Authority Area

Upcoming 2021 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 2021 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 2021 SERTP Process. The years shown represent Summer Peak conditions.

SITE	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
BULL RUN FP UNIT 1	925	0	--	--	--	--	--	--	--	--
ALLEN CT UNIT 1	18	18	0	--	--	--	--	--	--	--
ALLEN CT UNIT 9	18	18	0	--	--	--	--	--	--	--
COLBERT CT UNIT 1	--	--	219	219	219	219	219	219	219	219
COLBERT CT UNIT 2	--	--	219	219	219	219	219	219	219	219
COLBERT CT UNIT 3	--	--	219	219	219	219	219	219	219	219
PARADISE CT UNIT 1	--	--	219	219	219	219	219	219	219	219
PARADISE CT UNIT 2	--	--	219	219	219	219	219	219	219	219
PARADISE CT UNIT 3	--	--	219	219	219	219	219	219	219	219

TVA Balancing Authority Area

TVA – Generation Assumptions

The following table depicts the generation assumptions that change throughout the ten year planning horizon for the 2021 SERTP Process. The years shown represent Summer Peak conditions.

SITE	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
HORUS SOLAR	--	69	69	69	69	69	69	69	69	69
SKYHAWK SOLAR	--	100	100	100	100	100	100	100	100	100
MCKELLAR SOLAR	--	70	70	70	70	70	70	70	70	70
GOLDEN TRIANGLE SOLAR	--	200	200	200	200	200	200	200	200	200
BELL BUCKLE SOLAR	--	35	35	35	35	35	35	35	35	35
RIDGLEY SOLAR	--	177	177	177	177	177	177	177	177	177

SERTP

Regional Transmission Analyses Overview

Regional Transmission Analysis

Regional Transmission Analyses Overview

- Assess if the then current regional transmission plan addresses the Transmission Provider's transmission needs

- Assess whether there may be more efficient or cost effective transmission projects to address transmission needs

Regional Transmission Analysis

Assessment of Current Regional Plan

- **SERTP Sponsors developed 6 coordinated regional models***
- **Models include latest transmission planning model information within the SERTP region**
- **Contingency analysis was performed to identify potential constraints that may result from the regional coordination of latest input assumptions**

*Available on the secure area of the SERTP website upon satisfying access requirements

No.	Season	Year
1	Summer	2022
2		2025
3		2030
4	Shoulder	2025
5	Winter	2025
6		2030

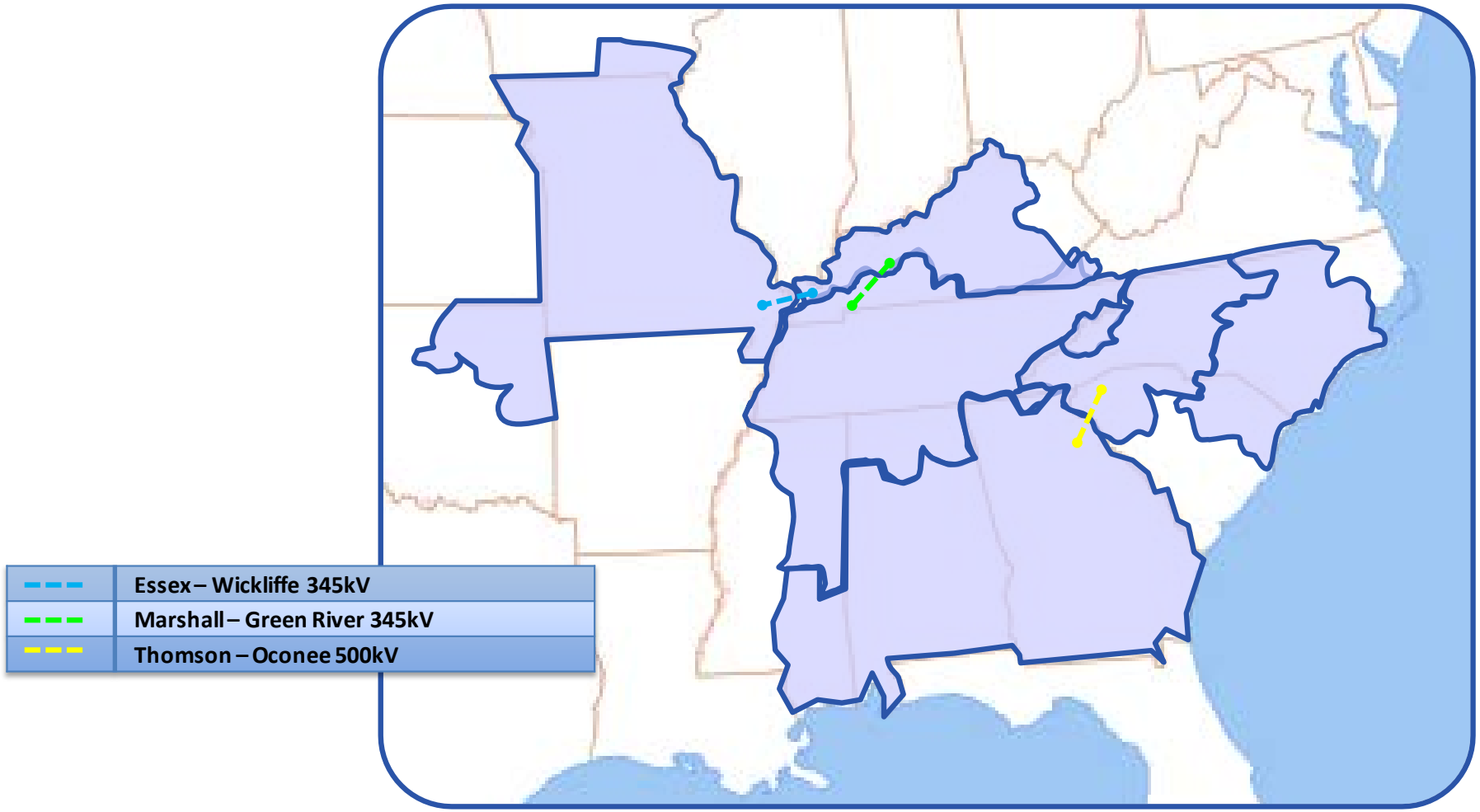
2020 Regional Transmission Analyses

Alternative Regional Transmission Projects

Alternative Regional Transmission Projects	Miles	From	To
		BAA (State)	BAA (State)
Essex – Wickliffe 345kV	50	AECI (MO)	LG&E/KU (KY)
Marshall – Green River 345kV	85	TVA (TN)	LG&E/KU (KY)
Thomson – Oconee Newport T.L. 500kV	130	SBAA (GA)	DEC (SC)

2020 Regional Transmission Analyses

Alternative Regional Transmission Projects



Southeastern Regional TRANSMISSION PLANNING

2020 Regional Transmission Analyses

Regional Transmission Analyses Overview

- **No significantly constrained transmission facilities were identified in the assessment of the current regional transmission plan.**

- **No evaluated transmission project alternatives were found to be more efficient or cost effective.**
  - Estimated cost of transmission project alternatives significantly outweighed potential benefits.

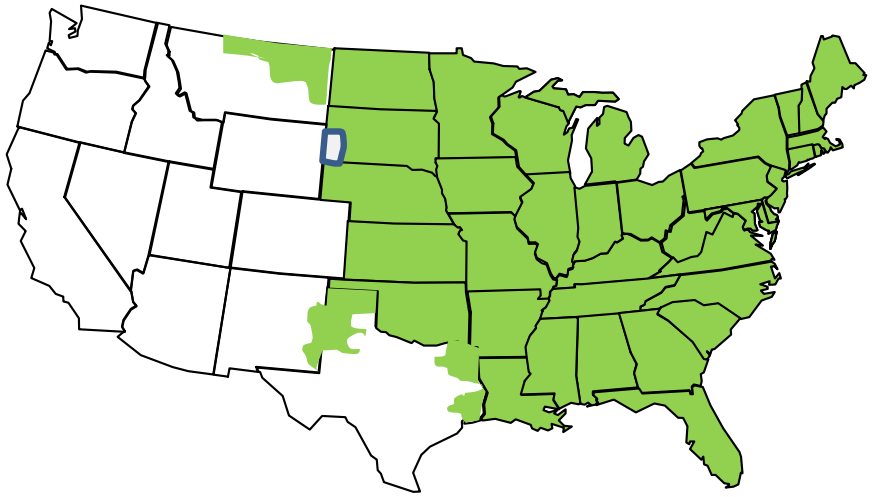
- **The regional transmission analyses summary is posted on the SERTP website.**

SERTP

Miscellaneous Updates

Eastern Interconnection Planning Collaborative Update

EIPC



Planning Coordinators

- Associated Electric Cooperative (AECI)
- Cube Hydro Carolinas
- Duke Energy – Carolinas
- Duke Energy – Florida
- Duke Energy – Progress
- LGE / KU
- Florida Power & Light
- Georgia Transmission Corporation
- ISO – New England
- MISO
- MEAG
- New York ISO
- PJM
- PowerSouth
- SCE&G- Dominion Energy South Carolina
- SCPSA – Santee Cooper
- Southern Company
- SPP
- TVA

EIPC Update

Key Initiatives

- An Eastern Interconnection High Renewables Study for 2028 is underway, utilizing power flow and production cost analysis. Completion is scheduled for mid-year 2021
- Released the Final Report on the Frequency Response of the EI showing the system frequency will be maintained for at least the next five years despite a changing resource mix
- Formed a new Electric-Gas Task Force and provided comments on NERC's Fuel Assurance Guidelines
- Advised MMWG on the creation of models for dynamic analysis of low inertia conditions
- Filed comments at FERC calling for reforms to ensure adequate protection of sensitive CEII Information

http://www.eipconline.com

Regional Planning Updates

- Version 3 SERTP Regional Models available on SERTP Website

- Interregional Data Exchange:
  - Exchanged the latest transmission models for the ten year planning horizon with FRCC
  - FRCC models will be incorporated into subsequent regional power flow models

Planning Study Updates

- Coordination study to assess the impact of the proposed tie line between FPL and Gulf Power with a 850MW transfer between FPL and Gulf Power is near completion

- Coordination study group to prepare for Vogtle 3 and 4 coming online is still on going.

Upcoming 2021 SERTP Process

- **SERTP 1st Quarter – *1st RPSG Meeting & Interactive Training Session***

  March 2021

  – Form Regional Planning Stakeholder Group "RPSG"
  – Select Economic Planning Studies
    - RPSG Economic Study Request Form
  – Interactive Training Session

- **SERTP 2nd Quarter – *Preliminary Expansion Plan Meeting***

  June 2021

  – Review Modeling Assumptions1
  – Preliminary 10 Year Expansion Plan
  – Stakeholder Input & Feedback Regarding the Plan

Upcoming 2020 SERTP Process

- **SERTP 3rd Quarter – *2nd RPSG Meeting***

  September 2021

  – Preliminary Results of the Economic Studies
  – Stakeholder Input & Feedback Regarding the Study Results
  – Discuss Previous Stakeholder Input on the Expansion Plan

- **SERTP 4th Quarter – *Annual Transmission Planning Summit & Input Assumptions***

  December 2021

  – Final Results of the Economic Studies
  – Regional Transmission Plan
  – Regional Analyses
  – Stakeholder Input on the 2022 Transmission Model Input Assumptions

Questions?

www.southeasternrtp.com