SERTP – 3rd Quarter Meeting

2nd RPSG Meeting

September 29th, 2022

Web Conference

Process Information

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

Purposes & Goals of Meeting

- **Economic Planning Studies**
  - Preliminary Results
  - Stakeholder Input/Discussion
- **Miscellaneous Updates**
- **Next Meeting Activities**

SERTP Preliminary

Economic Planning Studies

Economic Planning Studies Process

- Economic Planning Studies were chosen by the Regional Planning Stakeholder Group "RPSG" in March at the 2022 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 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

- **Southern Company to Duke Energy Carolinas**
  - 1000 MW (2032 Summer Peak)
- **Dominion Energy South Carolina (Formerly SCEG) to Duke Energy Carolinas**
  - 1000 MW (2032 Summer Peak)
- **Southern Company to Santee Cooper**
  - 600 MW (2027 Winter Peak)
- **Southern Company to Santee Cooper**
  - 500 MW (2024 Summer Peak)
- **Duke Energy Carolinas to Santee Cooper**
  - 600 MW (2027 Winter Peak)

Power Flow Cases Utilized

- **Load Flow Cases:**
  - 2022 Series Version 1 SERTP Regional Models
    - 2024 Summer Peak
    - 2027 Winter Peak
    - 2032 Summer Peak

Preliminary 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%) 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 potential transmission enhancement(s)

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.

- 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

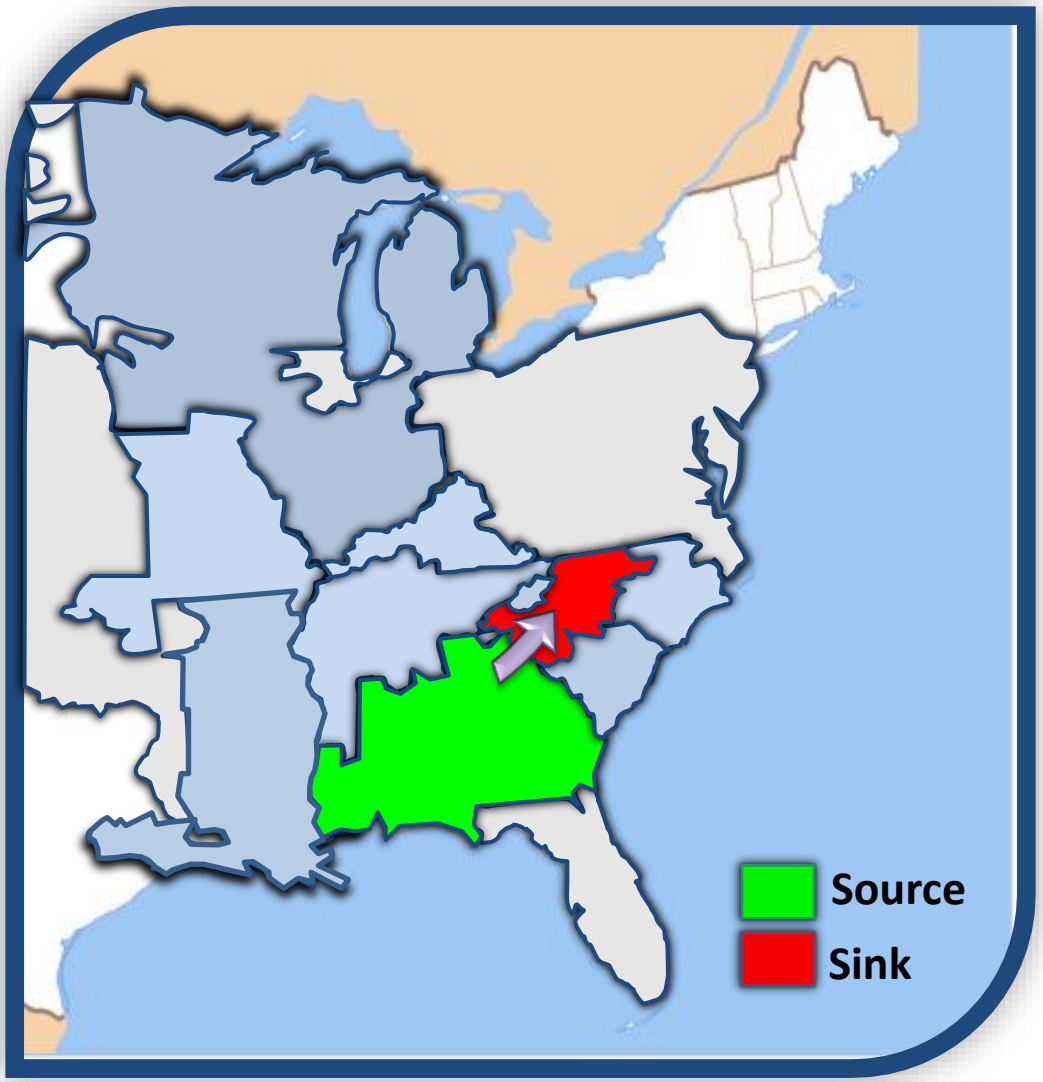
Economic Planning Studies – Preliminary Results

SOCO to DEC – 1000 MW

SOCO – DEC 1000 MW

Study Assumptions

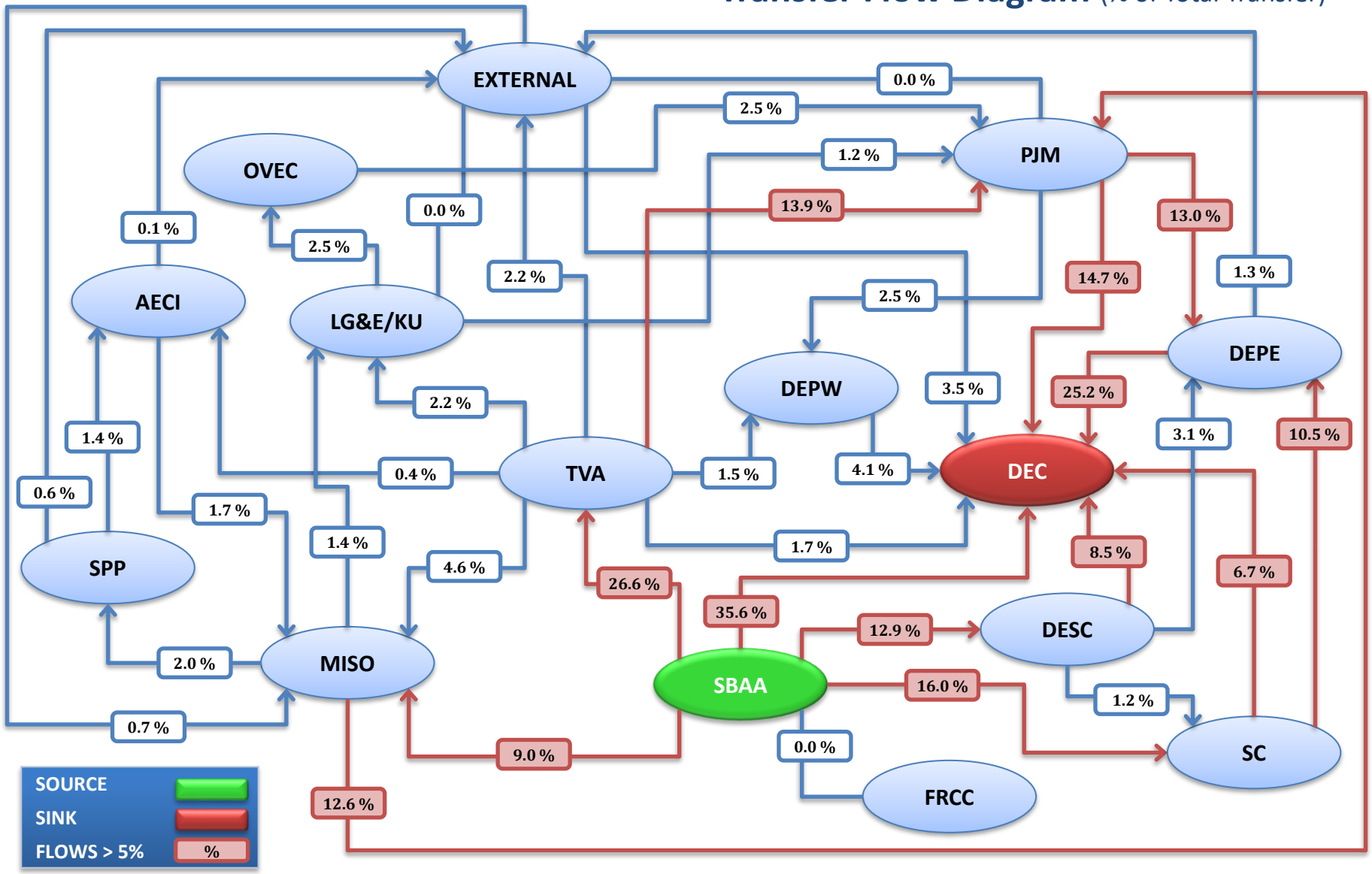
- **Source:** Generation within SOCO
- **Sink:** Generation within DEC
- **Transfer Type:** Generation to Generation
- **Year:** 2032
- **Load Level:** Summer Peak



Southeastern Regional
TRANSMISSION PLANNING

SOCO – DEC 1000 MW

Transfer Flow Diagram (% of Total Transfer)



SOCO – DEC 1000 MW

Transmission System Impacts

- **Transmission System Impacts Identified:**
  - DEC
  - Southern Company

- **Potential Transmission Enhancements Identified:**
  - DEC
  - Southern Company

SERTP TOTAL ($2022) = $174.1 Million

SOCO – DEC 1000 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)	$169 Million
Duke Progress East (DEPE)	$0
Duke Progress West (DEPW)	$0
Louisville Gas & Electric and Kentucky Utilities (LG&E/KU)	$0
PowerSouth (PS)	$0
Southern (SBAA)	$5.1 Million
Tennessee Valley Authority (TVA)	$0
SERTP TOTAL ($2022)	**$174.1 Million**

SOCO – DEC 1000 MW

Significant Constraints Identified – *DEC*

Table 1: Significant Constraints - DEC

Potential Enhancement	Limiting Element	Rating (MVA)	Thermal Loadings (%)	
			Without Request	With Request
P1	Lee Steam – Shady Grove Tie 100 kV TL (Lee Line)	132	88.1	94.5
P1	Lee Steam – Shady Grove Tie 100 kV TL (Piedmont Line)	132	94.5	101
P2	Wateree Switching – Great Falls Switching 100 kV TL	116	89	116.1
NA*	Catawba Nuclear – Allen Steam 230 kV TL	1055	92.6	104.1

*Project to address is in the current expansion plan, but not in version 1 models
+Potential future constraints can be found in the Economic Studies Report on the SERTP Website

Potential Enhancements Identified – *DEC*

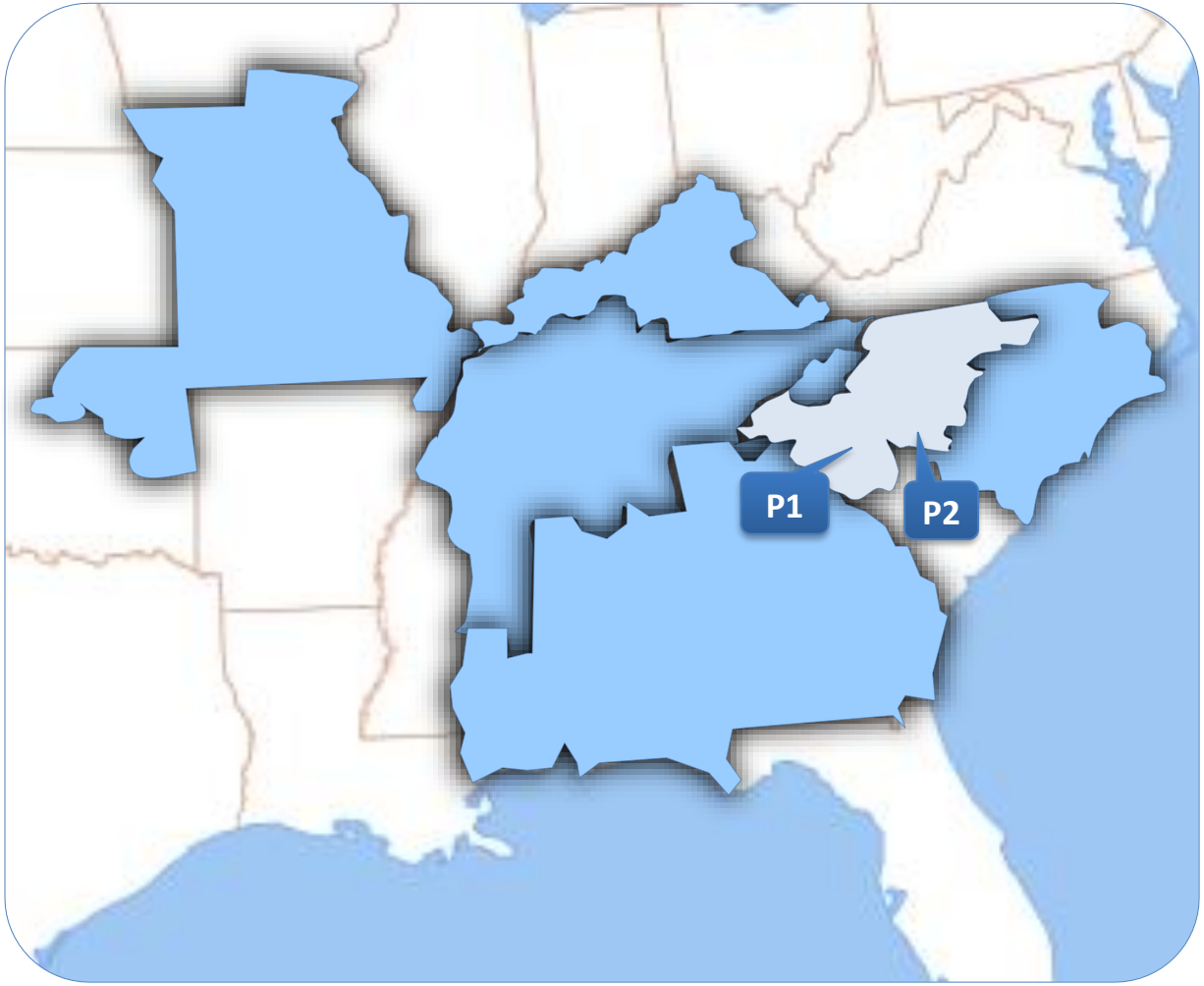
Table 2: Potential Enhancements - DEC

Item	Potential Enhancement	Planning Level Cost Estimate
P1	**Lee Steam Station – Shady Grove Tie 100 kV T.L.** • Rebuild both Lee Steam Station – Shady Grove Tie 100 kV Transmission Lines with 1158 ACSS/TW rated at 200˚C. Total rebuild length is 24.5 miles	**$90 Million**
P2	**Wateree Switching Station–Great Falls Switching Station 100 kV T.L.** • Rebuild 19.8 miles of the Wateree Switching Station – Great Falls Switching Station 100 kV T.L. with 954 ACSR rated at 120˚C	**$79 Million**
DEC TOTAL ($2022)		**$ 169 Million**(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.

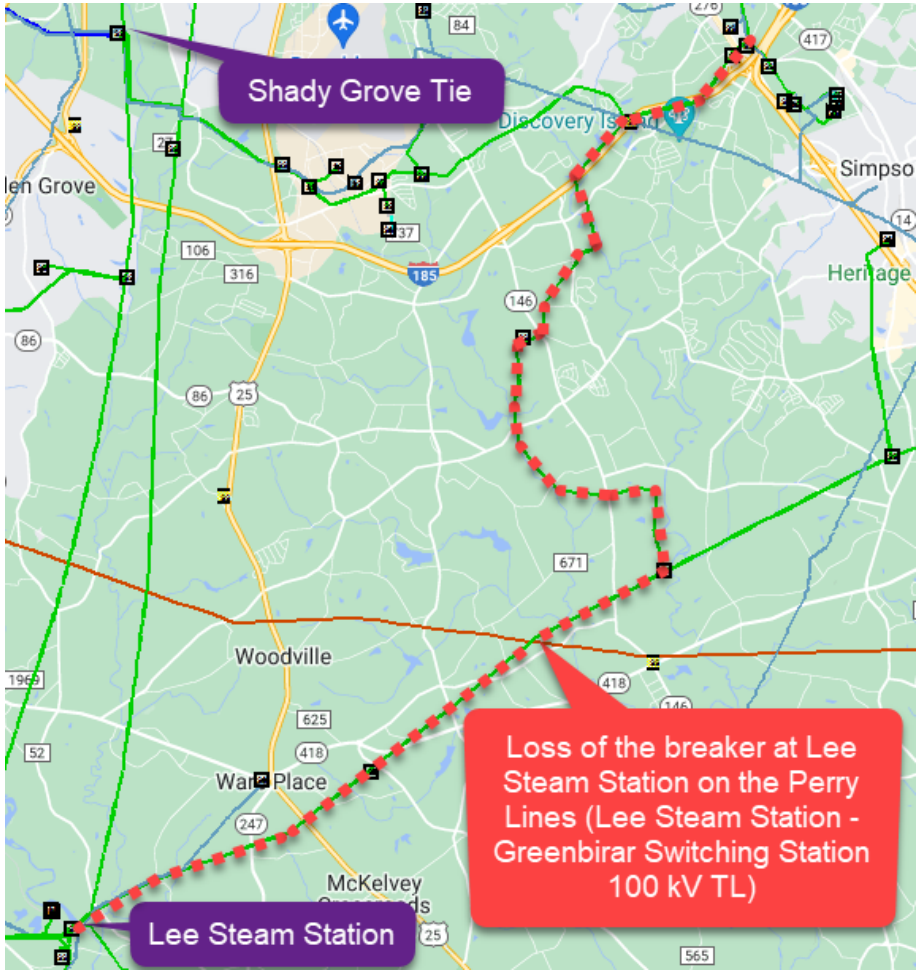
SOCO – DEC 1000 MW

Potential Enhancement Locations – *DEC*



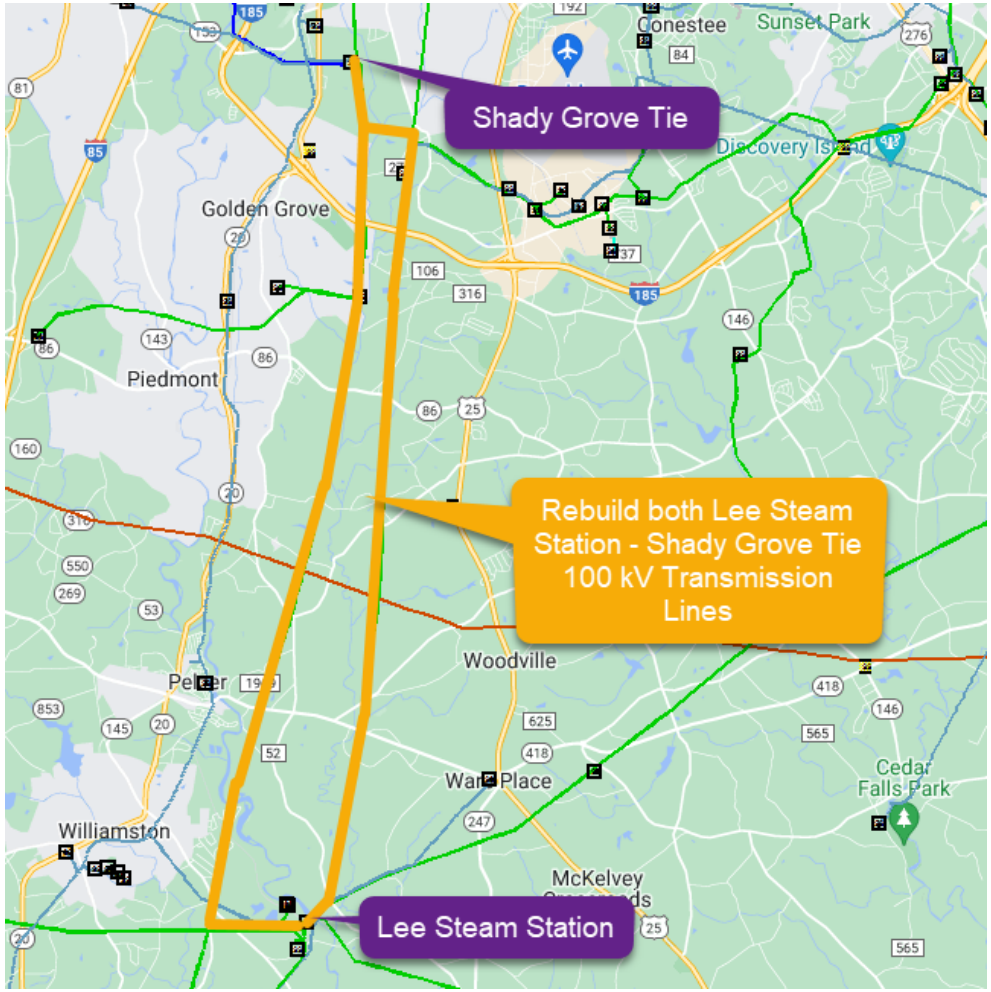
SOCO – DEC 1000 MW

Significant Constraint (P1) – *DEC*



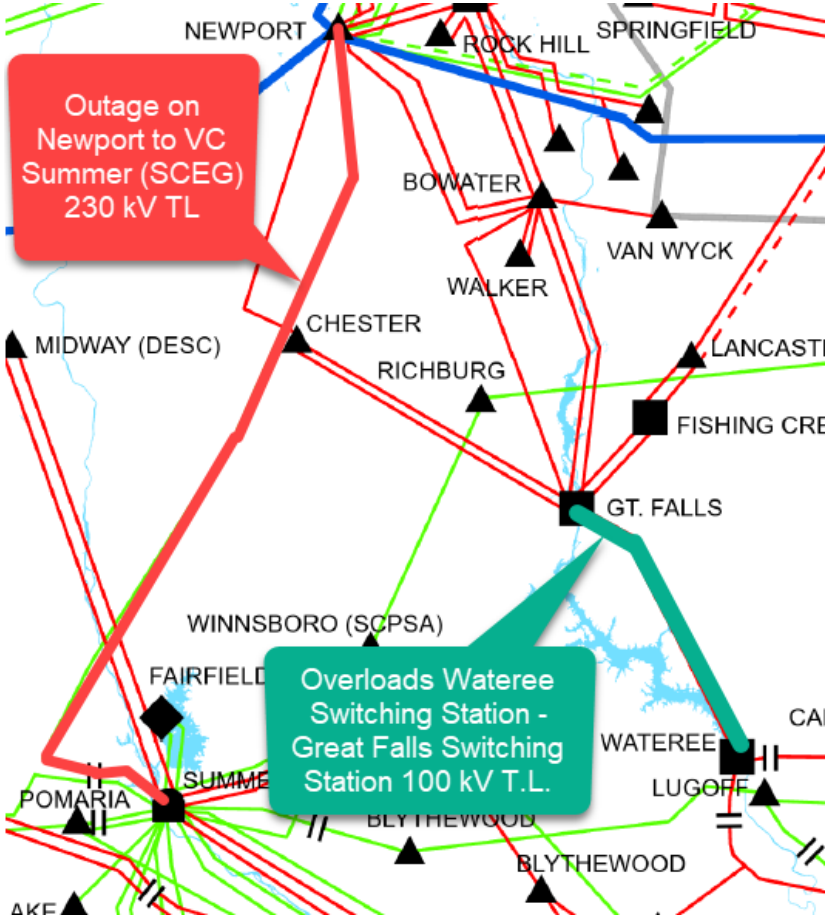
SOCO – DEC 1000 MW

Potential Enhancement (P1) – *DEC*



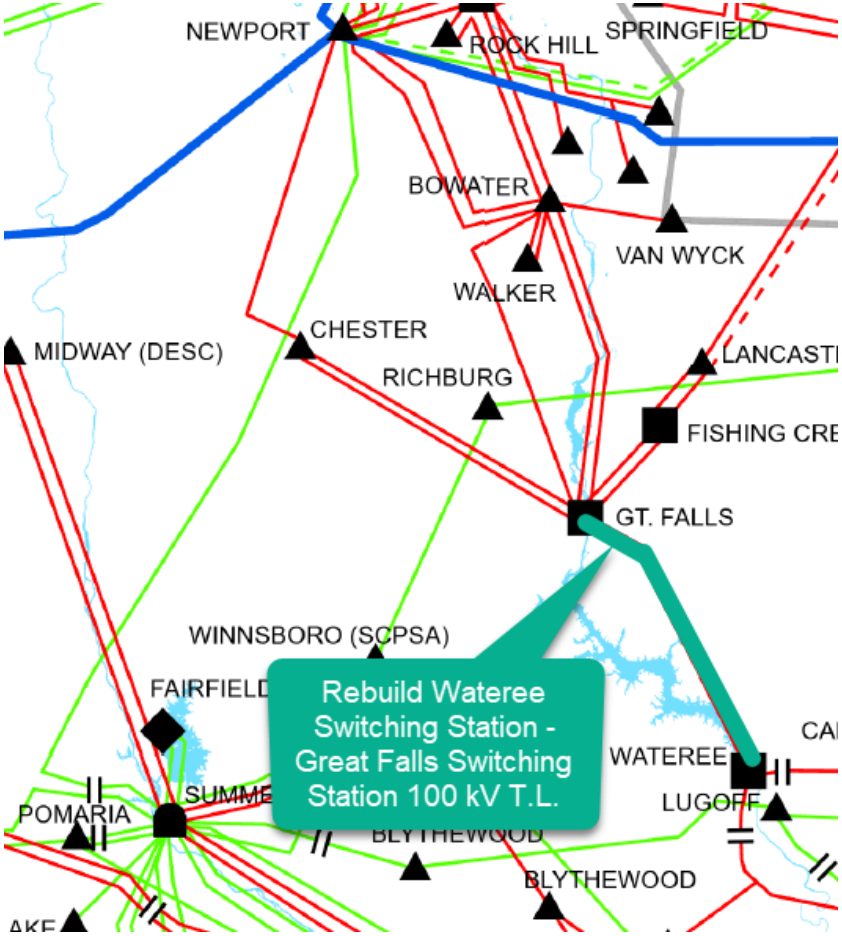
SOCO – DEC 1000 MW

Significant Constraint (P2) – *DEC*



SOCO – DEC 1000 MW

Potential Enhancement (P2) – *DEC*



SOCO – DEC 1000 MW

Significant Constraints Identified – *SOCO*

Table 1: Significant Constraints - SOCO

Potential Enhancement	Limiting Element	Rating (MVA)	Thermal Loadings (%)	
			Without Request	With Request
P1	Sigman Road – Cornish Mountain 115kV T.L	188	95.1	101.1

Potential Enhancements Identified – *SOCO*

Table 2: Potential Enhancements - SOCO

Item	Potential Enhancement	Planning Level Cost Estimate
P1	**Sigman Road – Cornish Mountain 115kV T.L.** • Rebuild the Sigman Road – Cornish Mountain 115kV section, approximately 5.3 miles of 100C 636.0 ACSR	**$5.1 Million**
SOCO TOTAL ($2022)		**$ 5.1 Million**(1)

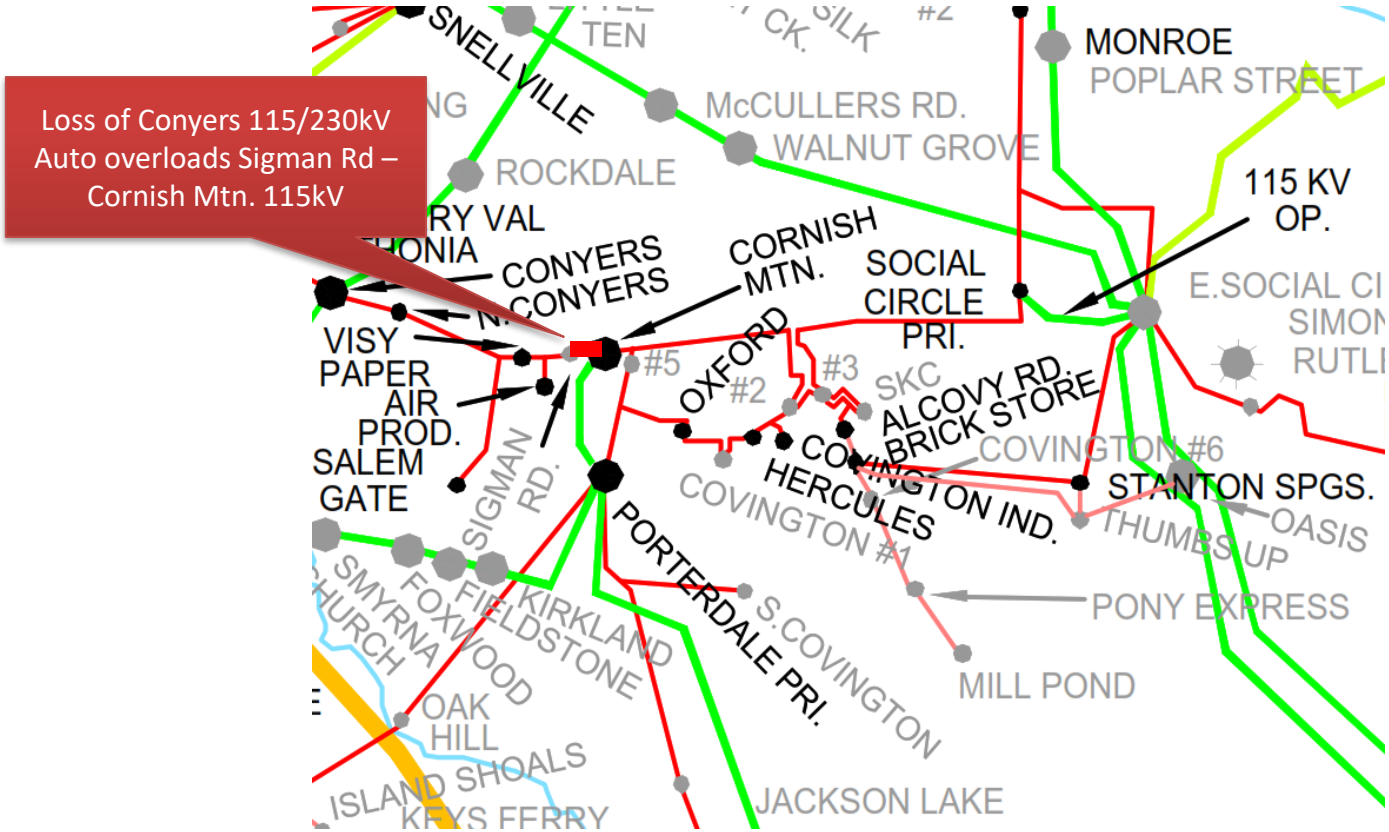
(1) Total planning level cost estimate does not include the cost of projects that are included in SERTP Sponsors' expansion plans and are scheduled to be completed by June 1st of the study year. The studied transfer depends on these projects being in-service, and the cost to support the study transfer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

SOCO – DEC 1000 MW

Potential Enhancement Locations – *SOCO*

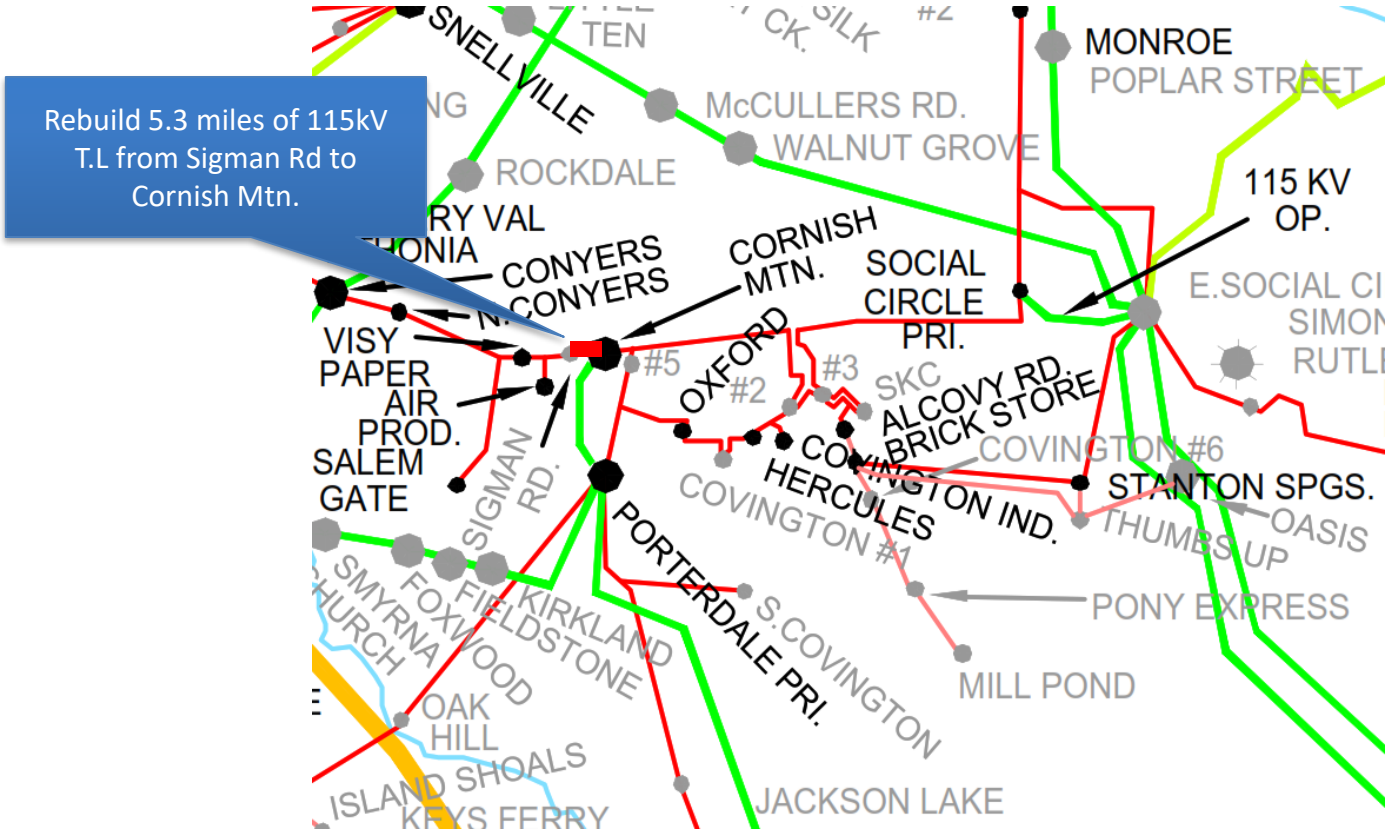
SOCO – DEC 1000 MW

Significant Constraint (P1) – *SOCO*



SOCO – DEC 1000 MW

Significant Constraint (P1) – *SOCO*



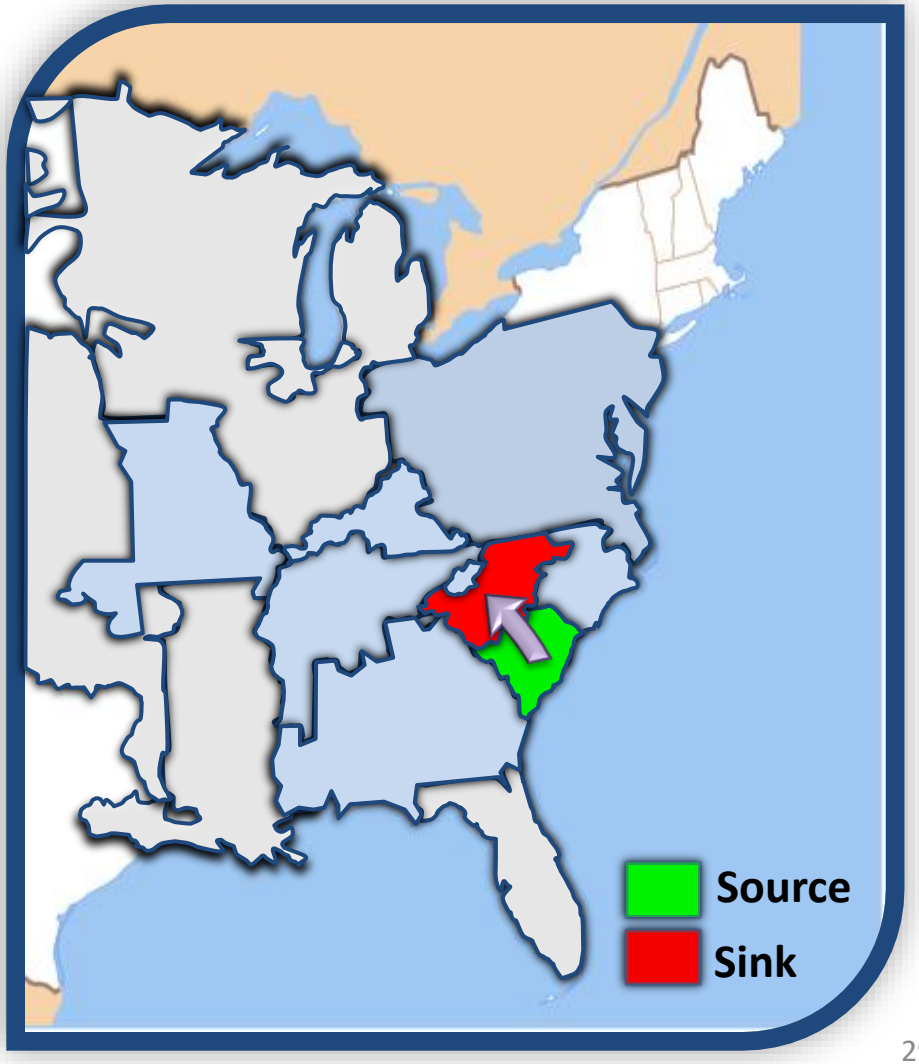
Economic Planning Studies – Preliminary Results

DESC to DEC – 1000 MW

DESC – DEC 1000 MW

Study Assumptions

- **Source:** Generation Scale within DESC
- **Sink:** Generation with DEC
- **Transfer Type:** Generation to Generation
- **Year:** 2032
- **Load Level:** Summer Peak



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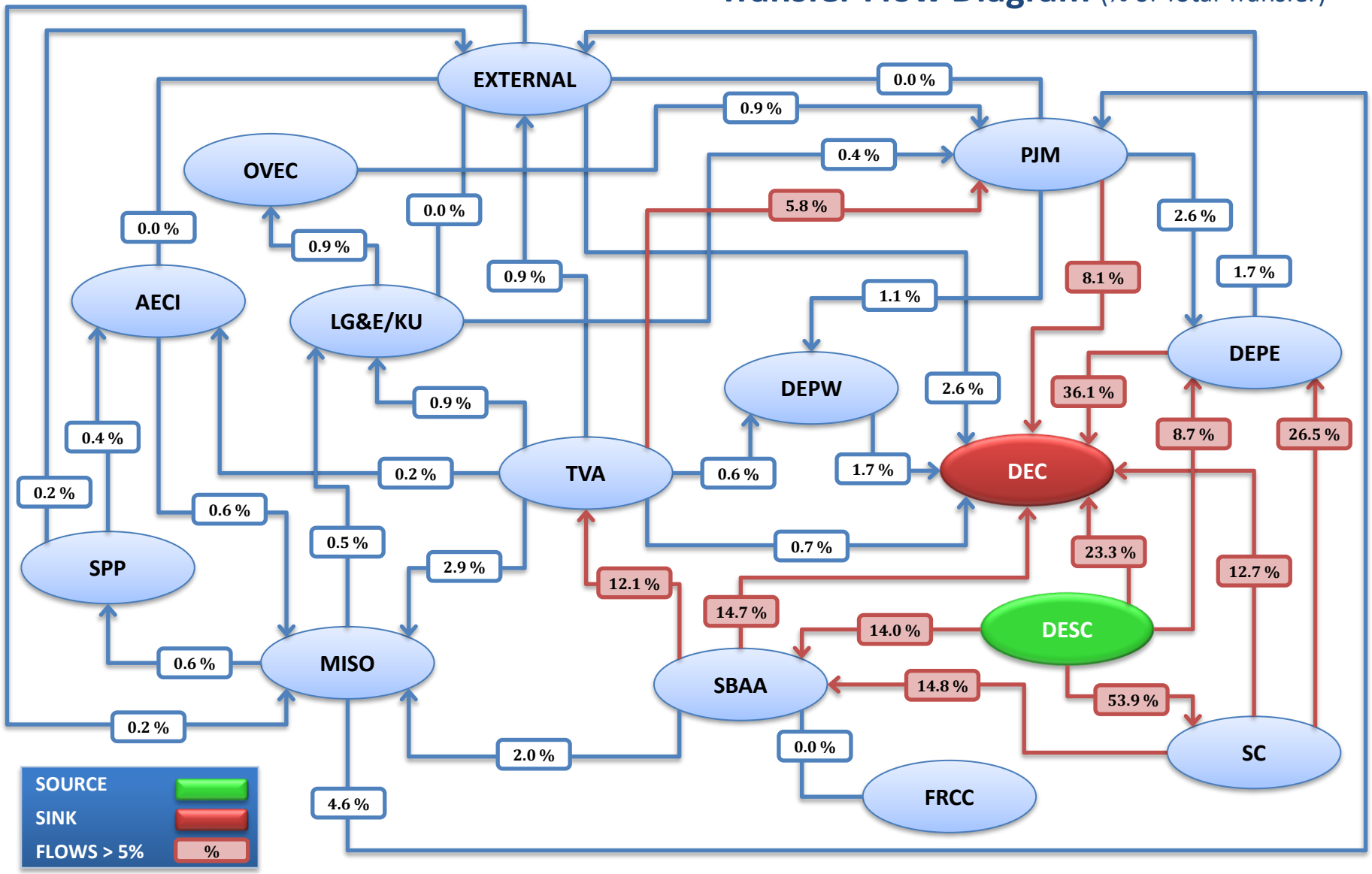
DESC to DEC – 1000 MW

Transfer Flow Diagram (% of Total Transfer)



DESC – DEC 1000 MW

Transmission System Impacts – *SERTP*

- **Transmission System Impacts Identified:**
  - DEC

- **Potential Transmission Enhancements Identified:**
  - DEC

SERTP Total ($2022) = $281 Million

Transmission System Impacts – *SERTP*

Table 6: Transmission System Impacts - SERTP

Balancing Authority	Planning Level Cost Estimate
Associated Electric Cooperative (AECI)	$0
Duke Carolinas (DEC)	$281 Million
Duke Progress East (DEPE)	$0
Duke Progress West (DEPW)	$0
Louisville Gas & Electric and Kentucky Utilities (LG&E/KU)	$0
PowerSouth (PS)	$0
Southern (SBAA)	$0
Tennessee Valley Authority (TVA)	$0
SERTP TOTAL ($2022)	**$0**

DESC – DEC 1000 MW

Significant Constraints Identified – *DEC*

Table 1: Significant Constraints - DEC

Potential Enhancement	Limiting Element	Rating (MVA)	Thermal Loadings (%)	
			Without Request	With Request
P1	Lee Steam – Shady Grove Tie 100 kV TL (Lee Line)	132	88.1	94.5
P1	Lee Steam – Shady Grove Tie 100 kV TL (Piedmont Line)	132	94.5	101
P2	Clark Hill 115/100 kV Transformer	125	91.4	101.4
P3	Laurens Tie – Bush River Tie 100 kV TL	65	89.5	107.1
P4	Wateree Switching – Great Falls Switching 100 kV TL	116	89	130.4
NA*	Catawba Nuclear – Allen Steam 230 kV TL	1055	92.6	104.1

*Project to address is in the current expansion plan, but not in version 1 models
+Potential future constraints can be found in the Economic Studies Report on the SERTP Website

Potential Enhancements Identified – *DEC*

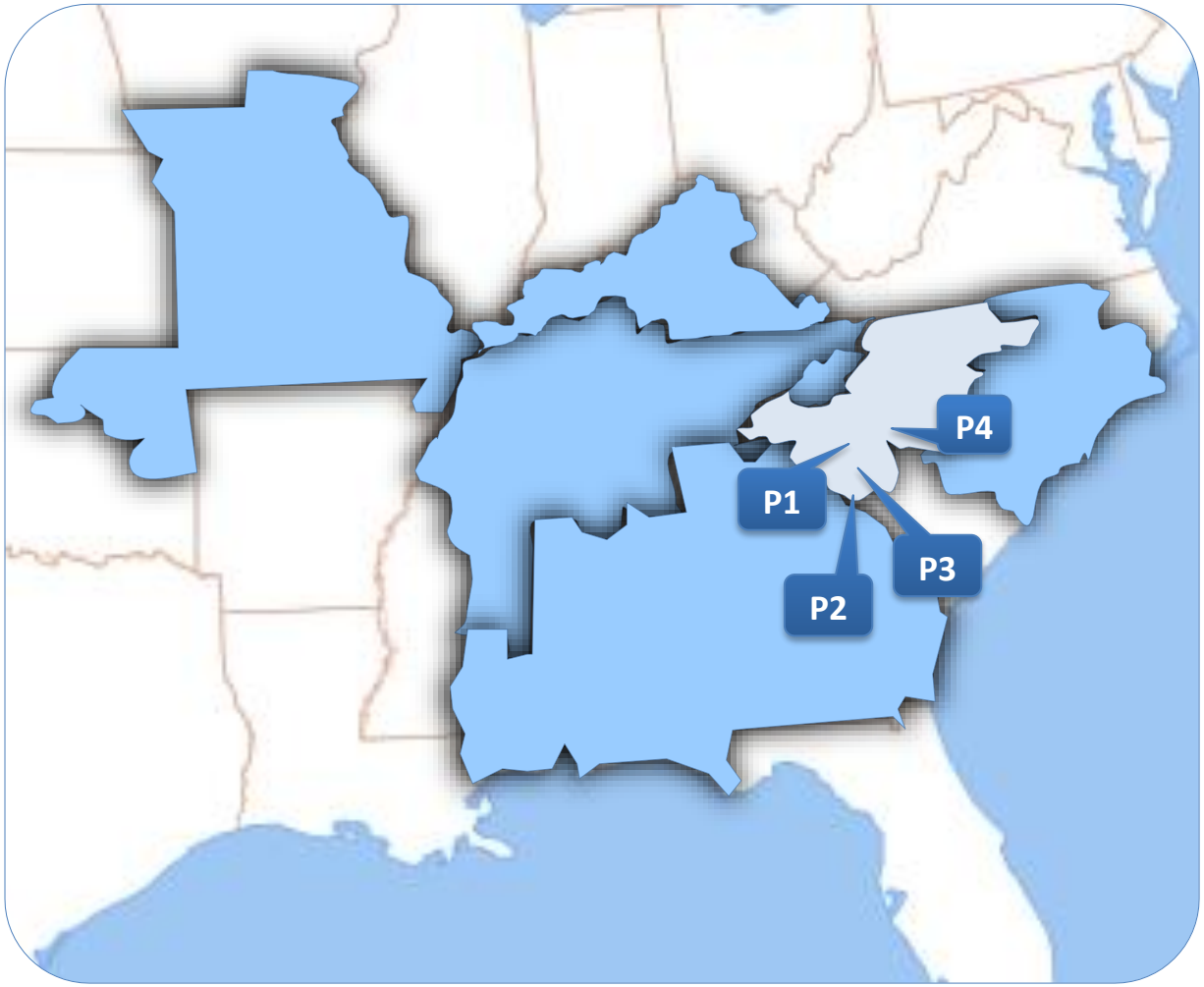
Table 2: Potential Enhancements - DEC

Item	Potential Enhancement	Planning Level Cost Estimate
P1	**Lee Steam Station – Shady Grove Tie 100 kV T.L.** • Rebuild both Lee Steam Station – Shady Grove Tie 100 kV Transmission Lines with 1158 ACSS/TW rated at 200˚C. Total rebuild length is 24.5 miles	**$90 Million**
P2	**Clark Hill 115/100 kV Transformer.** • Upgrade lowside terminal of the 115/100 kV transformer to improve rating	**$3 Million**
P3	**Laurens Tie – Bush River Tie 100 kV T.L.** • Rebuild 29.25 miles of the Laurens Tie – Bush River Tie 100 kV Transmission Lines with 1158 ACSS/TW rated at 200˚C.	**$109 Million**
P4	**Wateree Switching Station–Great Falls Switching Station 100 kV T.L.** • Rebuild 19.8 miles of the Wateree Switching Station – Great Falls Switching Station 100 kV T.L. with 954 rated at 120˚C	**$79 Million**
DEC TOTAL ($2022)		**$ 281 Million**(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.

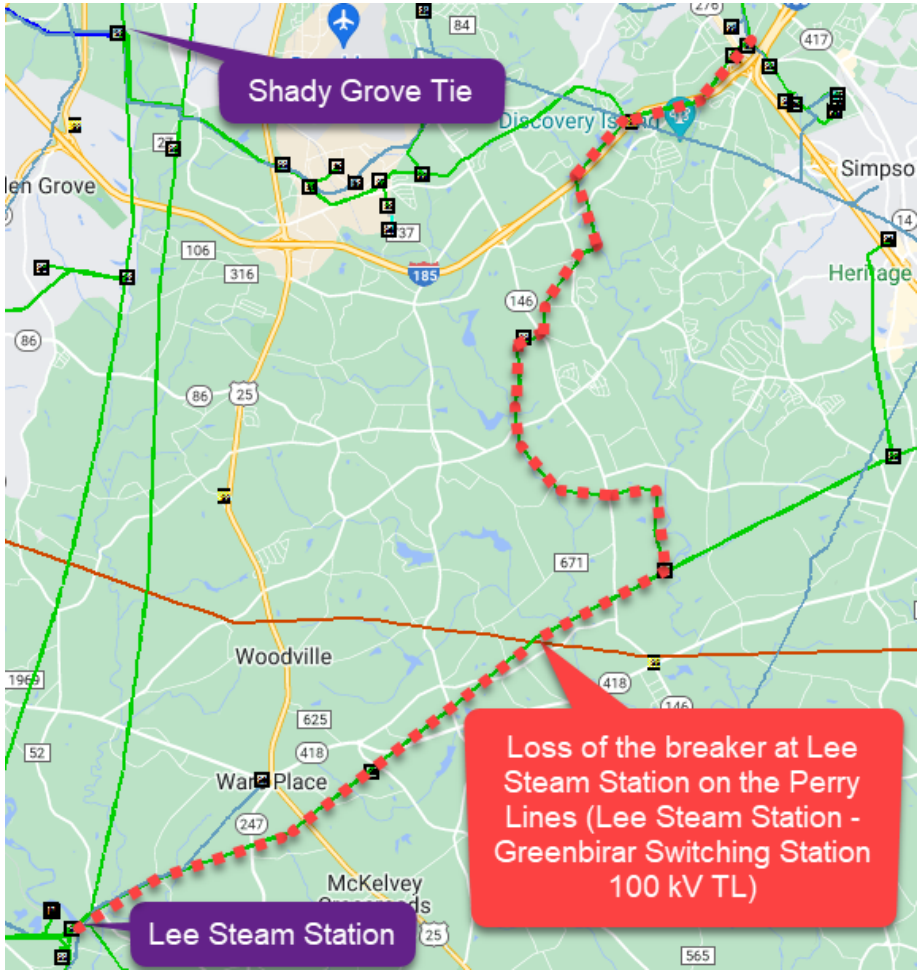
DESC – DEC 1000 MW

Potential Enhancement Locations – *DEC*



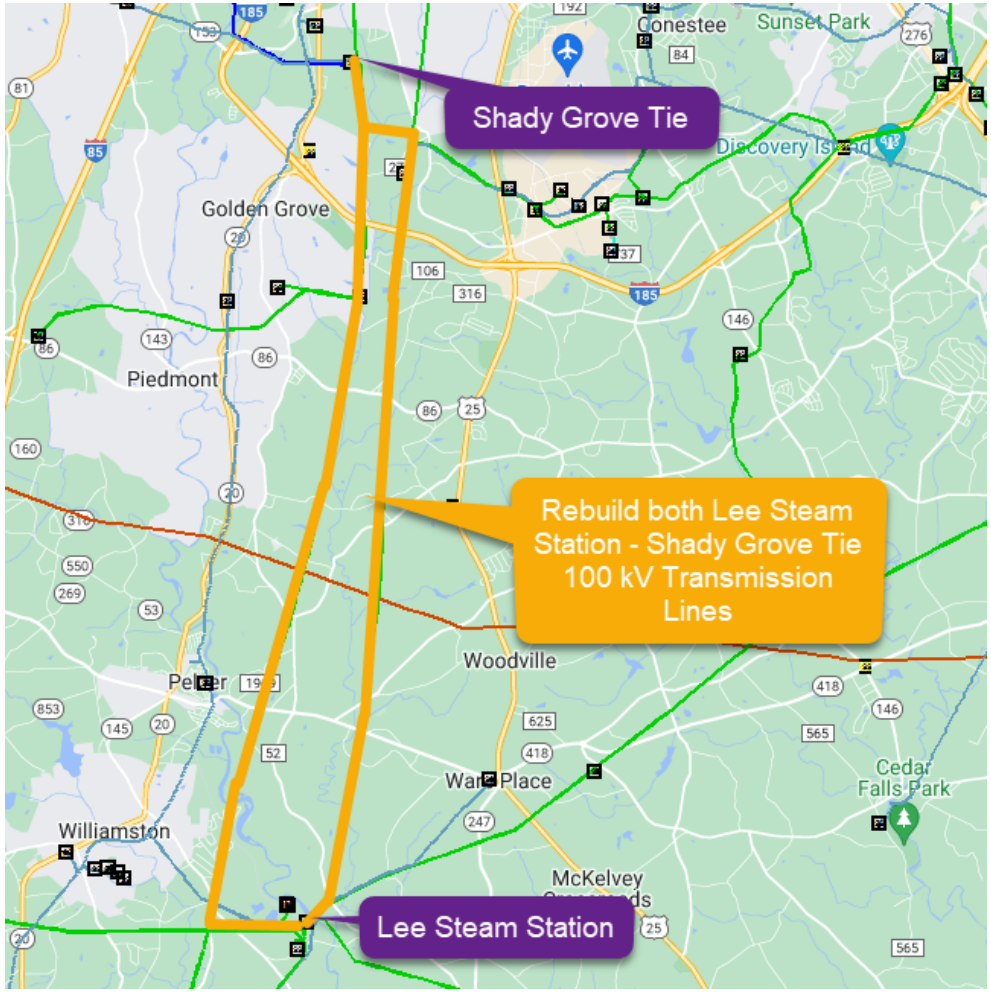
DESC – DEC 1000 MW

Significant Constraint (P1) – *DEC*



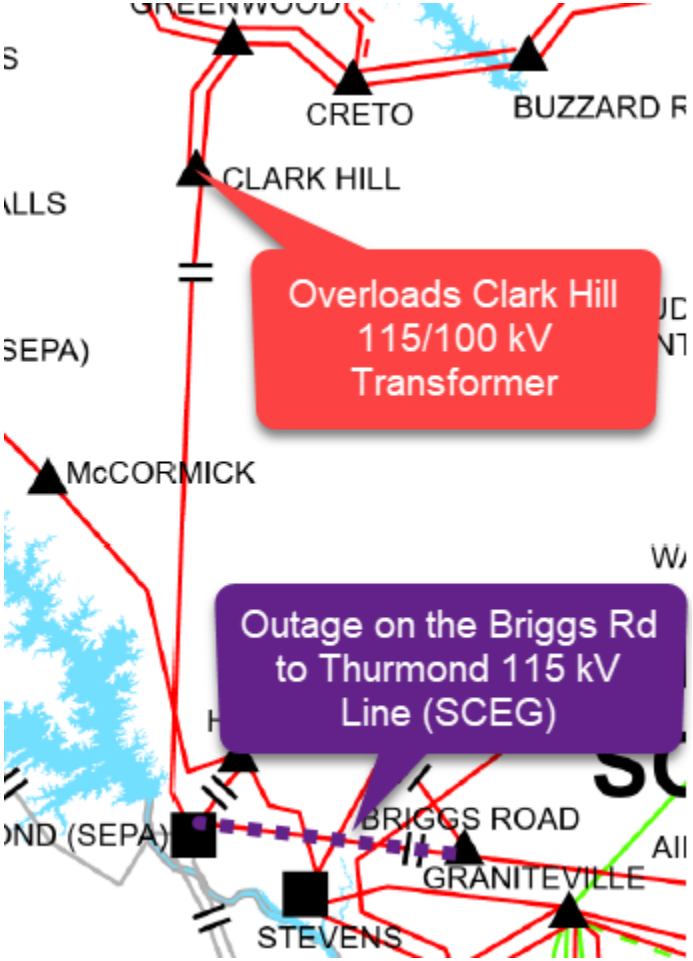
DESC – DEC 1000 MW

Potential Enhancement (P1) – *DEC*



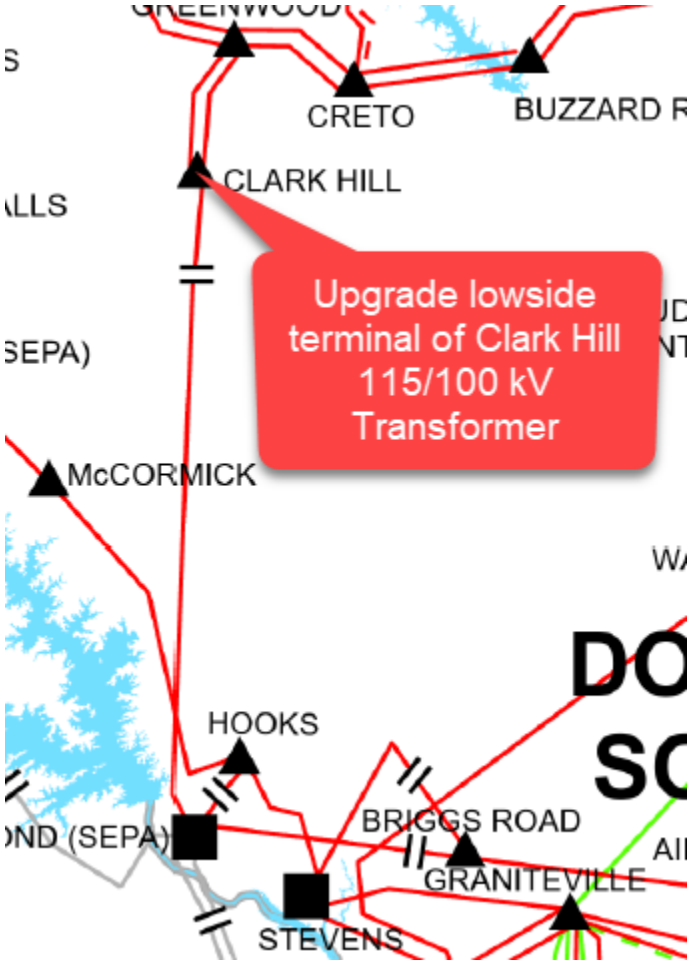
DESC – DEC 1000 MW

Potential Constraint (P2) – *DEC*



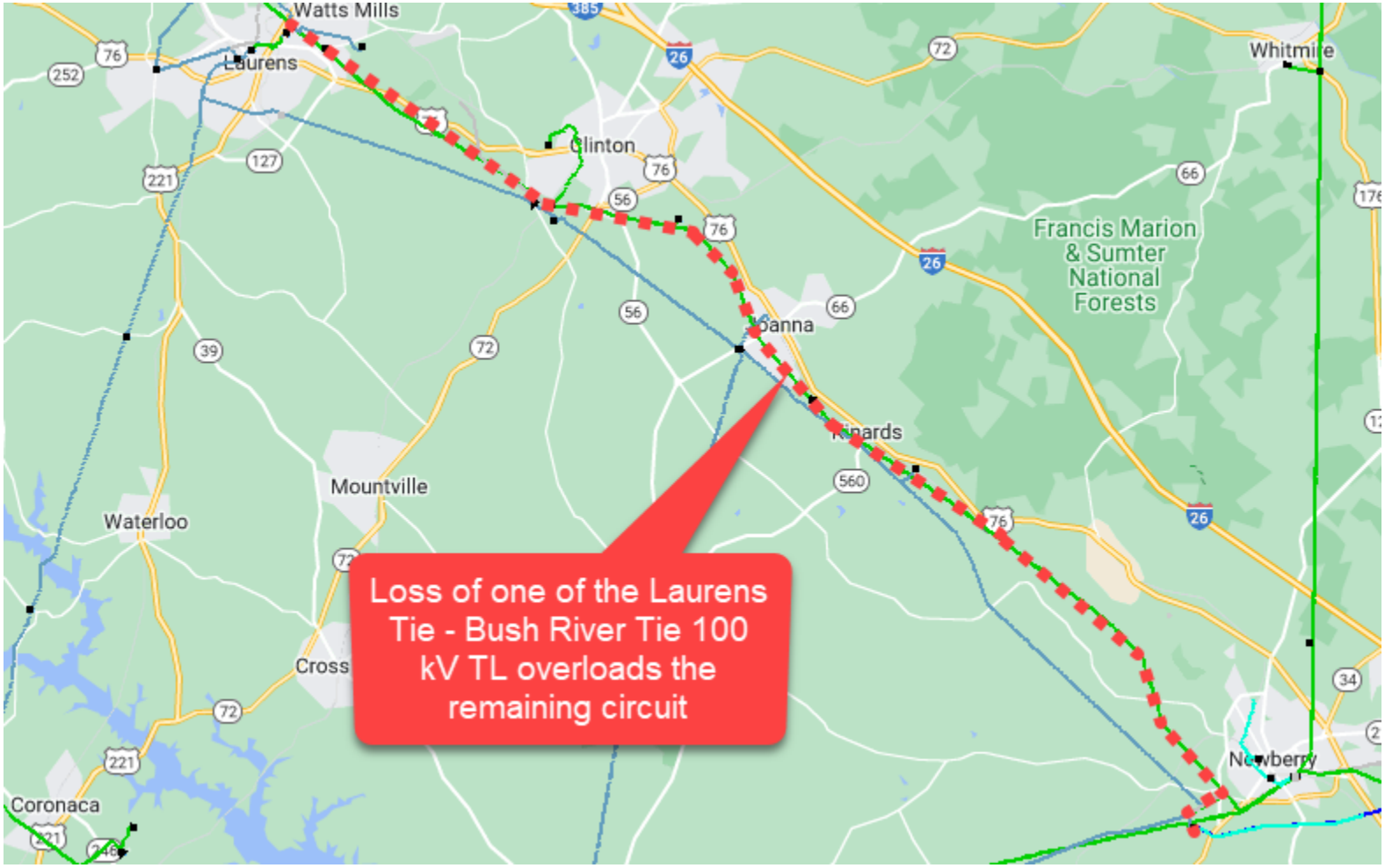
DESC – DEC 1000 MW

Significant Enhancement (P2) – *DEC*



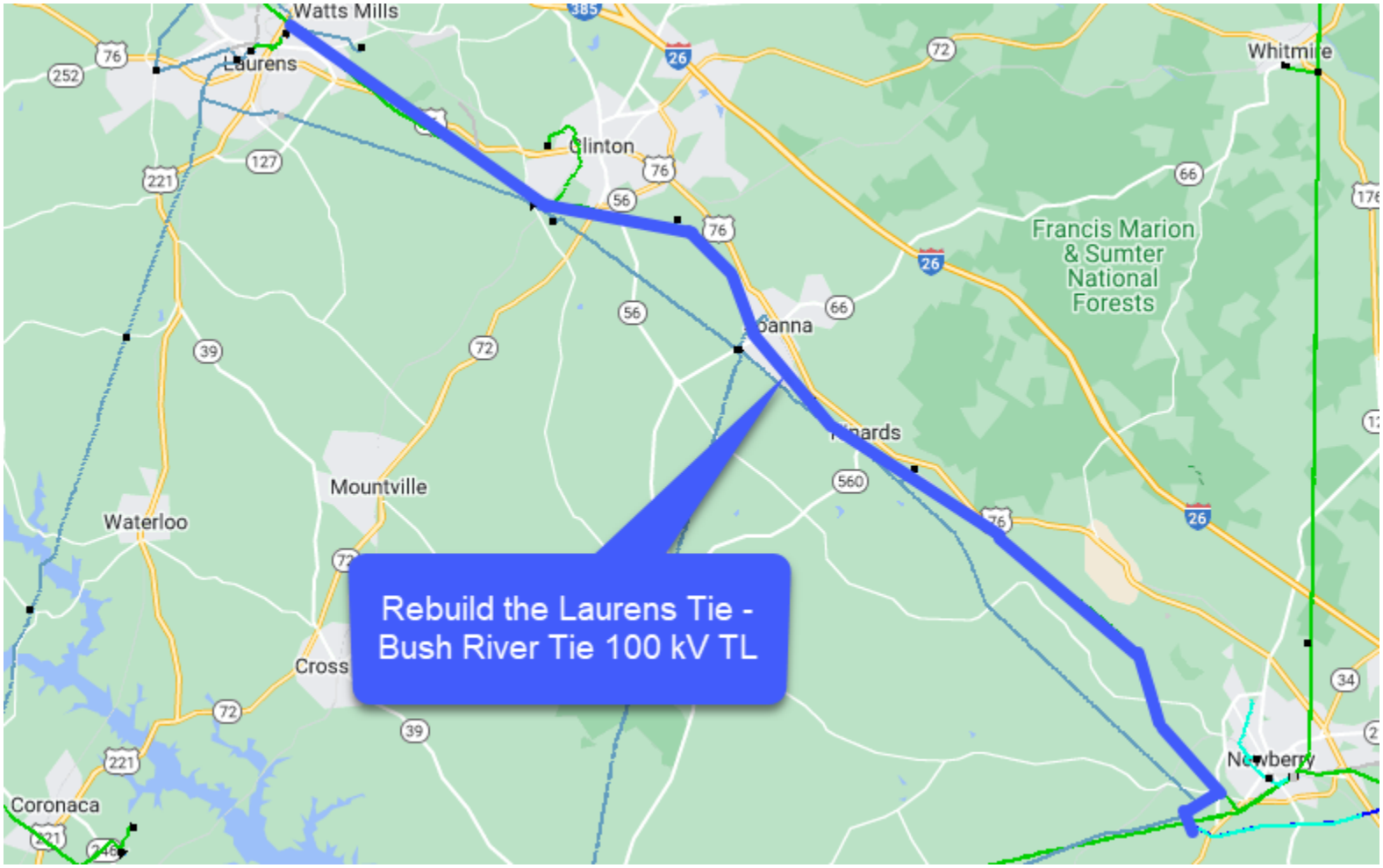
DESC – DEC 1000 MW

Significant Constraint (P3) – *DEC*



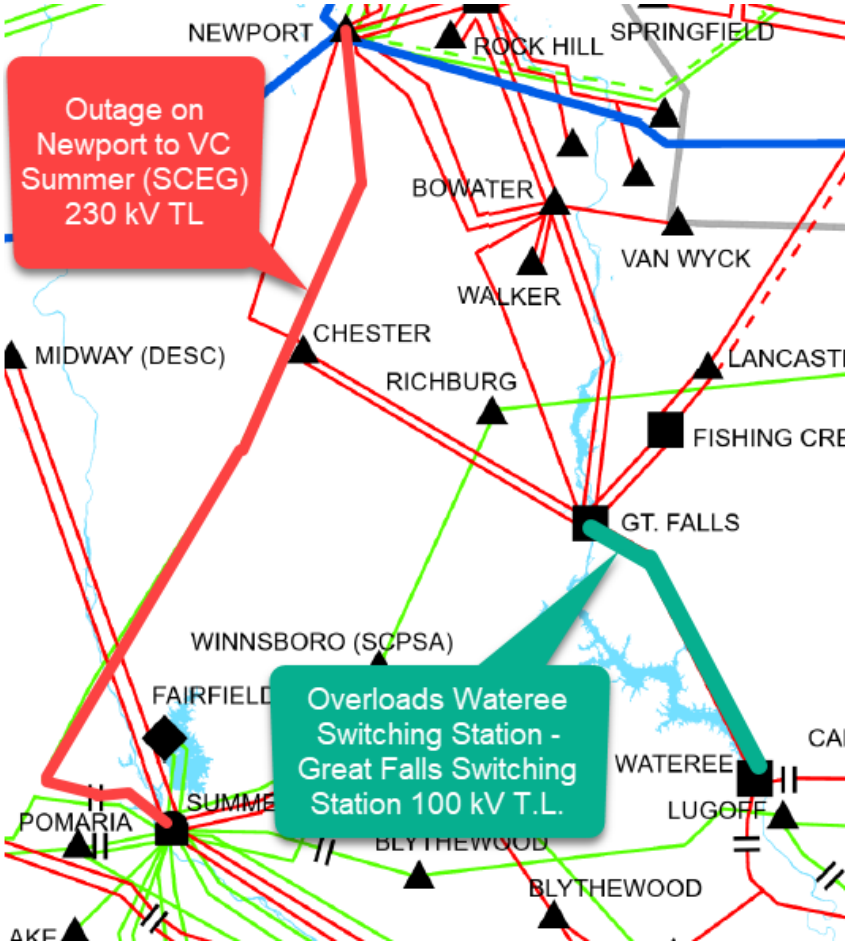
DESC – DEC 1000 MW

Potential Enhancement (P3) – *DEC*



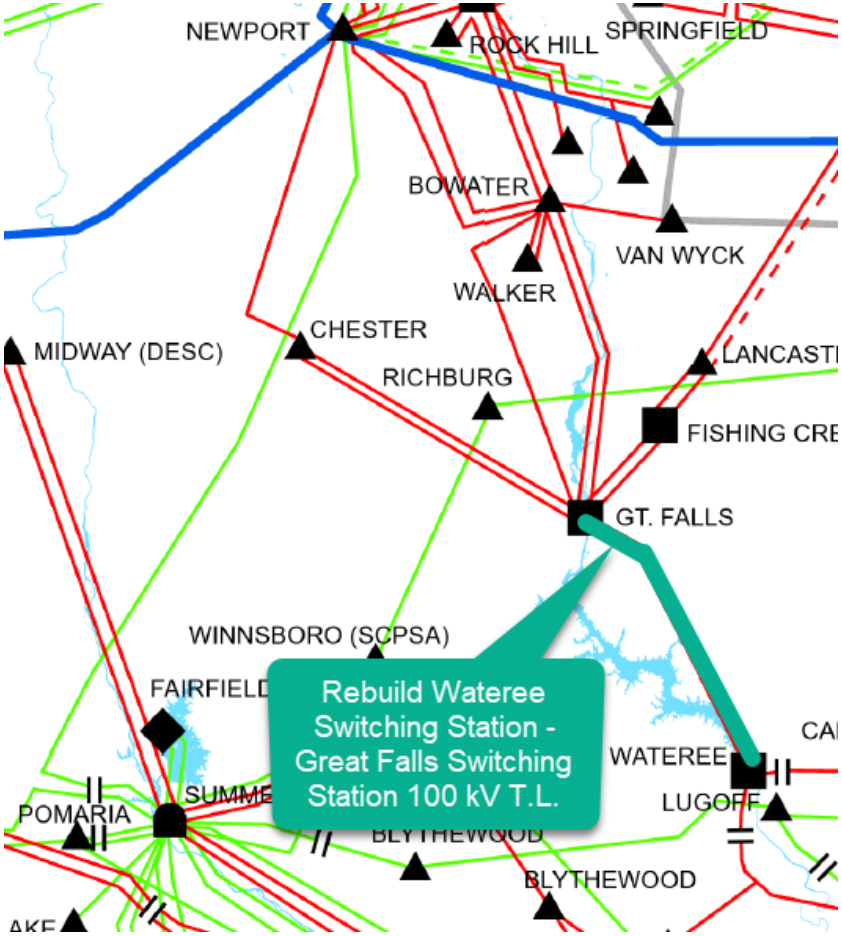
DESC – DEC 1000 MW

Significant Constraint (P4) – *DEC*



DESC – DEC 1000 MW

Potential Enhancement (P4) – *DEC*



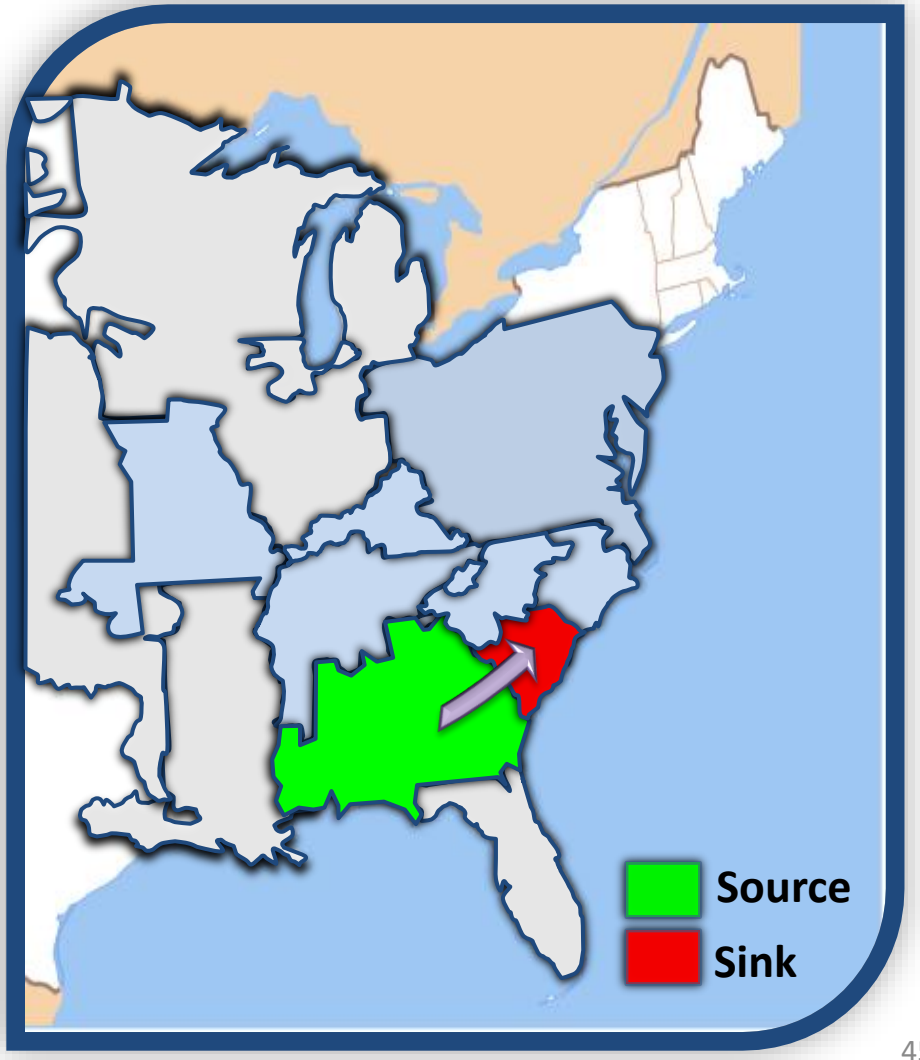
Economic Planning Studies – Preliminary Results

SOCO to SC – 600MW

SOCO – SC 600 MW

Study Assumptions

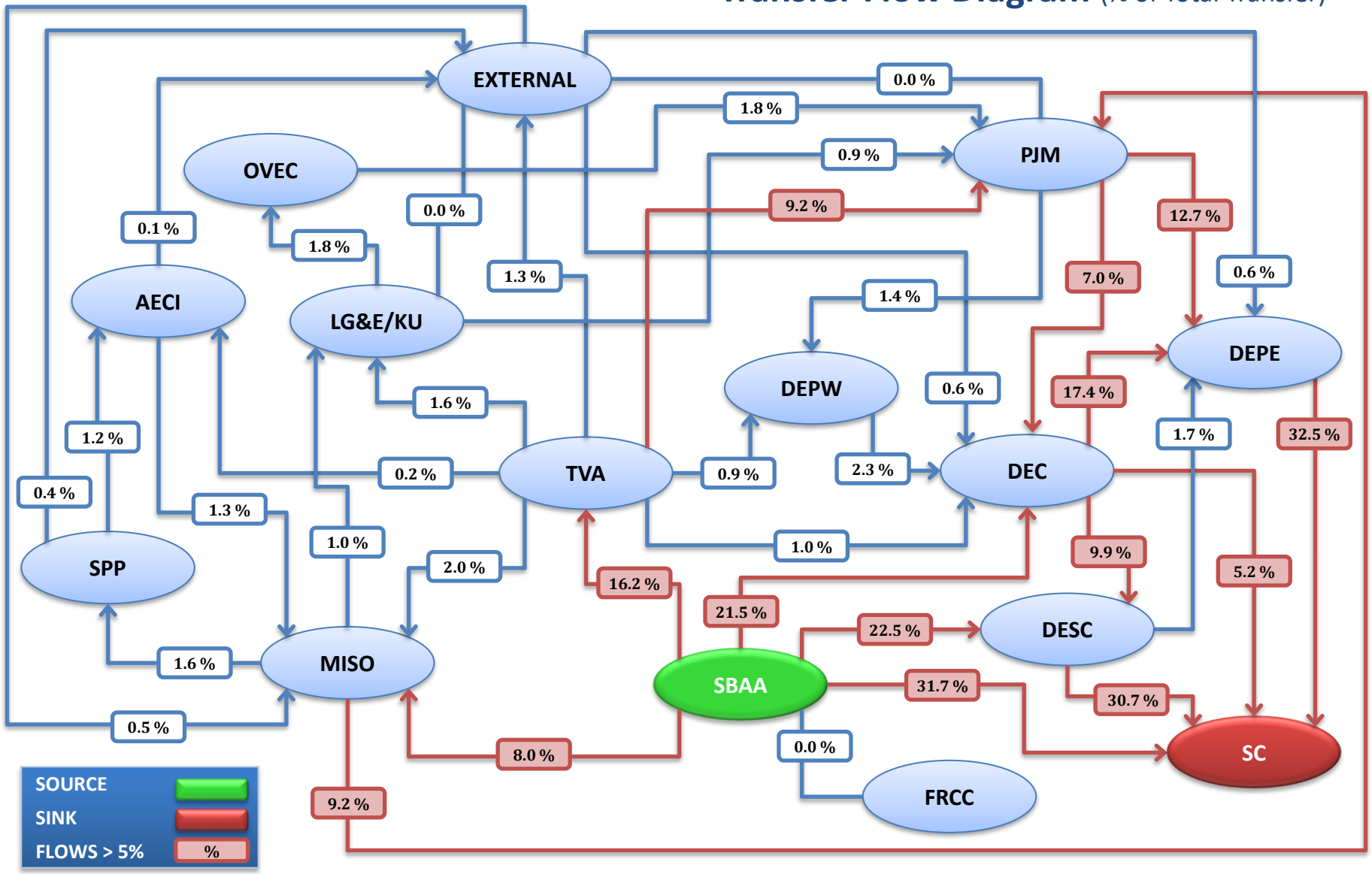
- **Source:** Generation Scale within SOCO
- **Sink:** Generation Scale with SC
- **Transfer Type:** Generation to Generation
- **Year:** 2027
- **Load Level:** Winter Peak



Southeastern Regional
TRANSMISSION PLANNING

SOCO to SC – 600MW

Transfer Flow Diagram (% of Total Transfer)



SOCO – SC 600 MW

Transmission System Impacts – *SERTP*

- **Transmission System Impacts Identified:**
  - None Identified

- **Potential Transmission Enhancements Identified:**
  - None Identified

SERTP Total ($2022) = $0

SOCO – SC 600 MW

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)	$0
PowerSouth (PS)	$0
Southern (SBAA)	$0
Tennessee Valley Authority (TVA)	$0
SERTP TOTAL ($2022)	**$0**

Economic Planning Studies

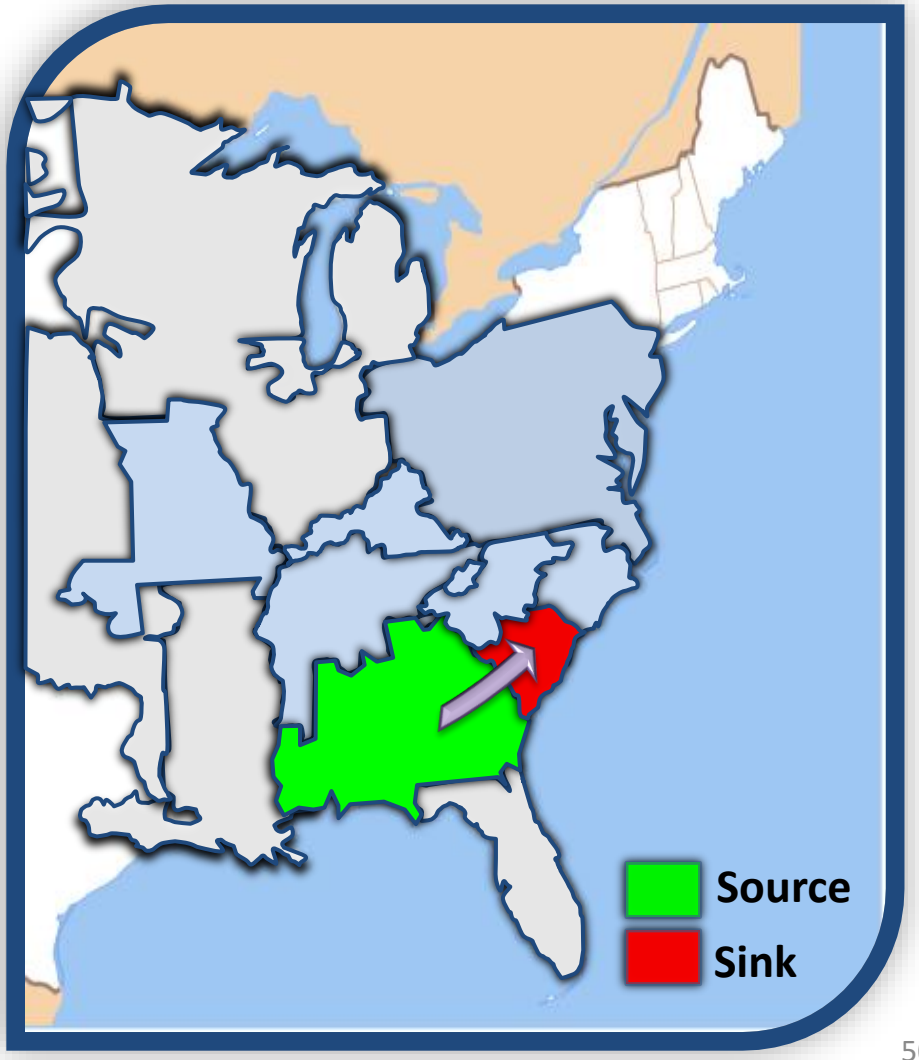
Economic Planning Studies – Preliminary Results

SOCO to SC – 500MW

SOCO – SC 500 MW

Study Assumptions

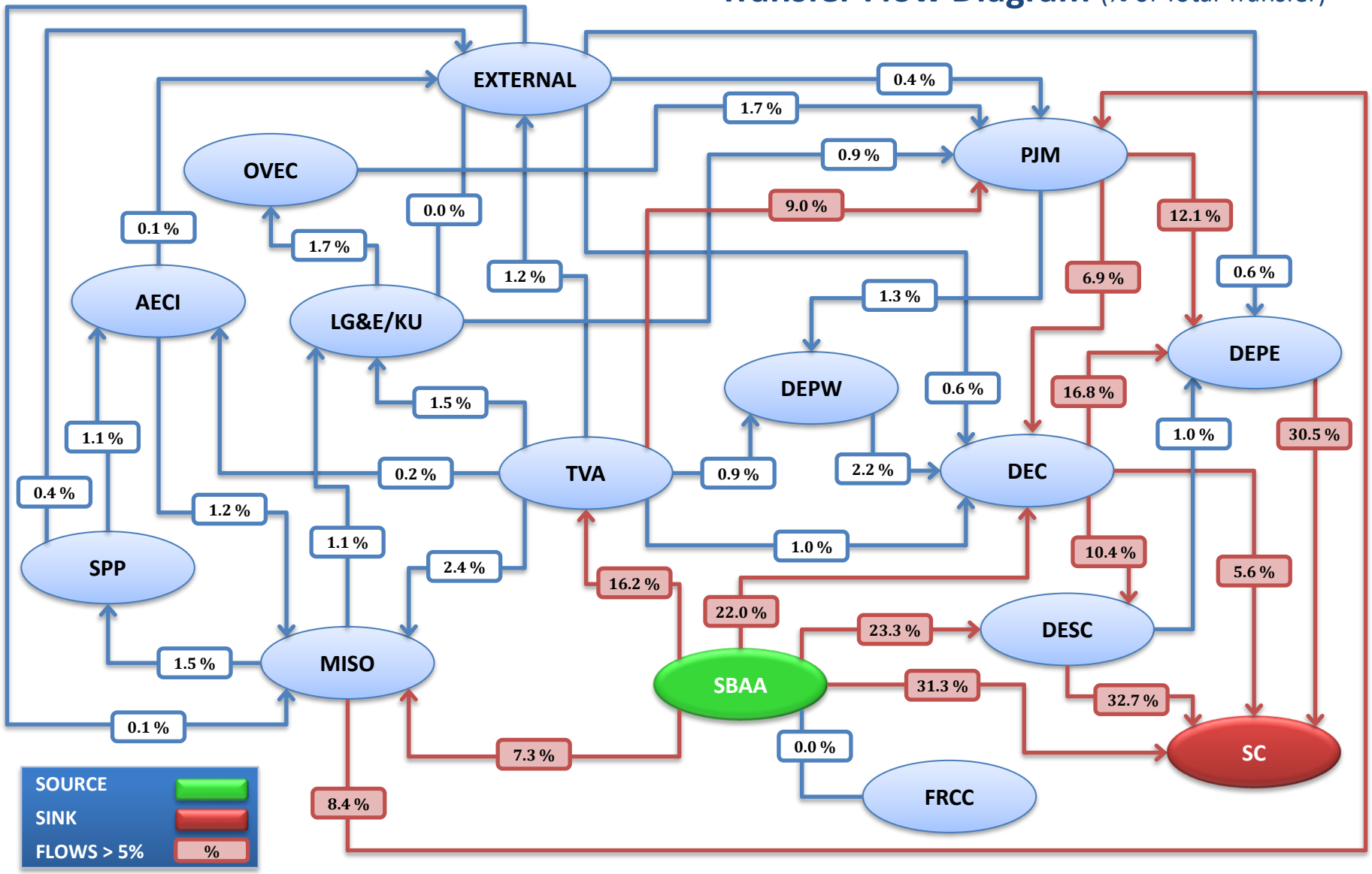
- **Source:** Generation Scale within SOCO
- **Sink:** Generation Scale with SC
- **Transfer Type:** Generation to Generation
- **Year:** 2024
- **Load Level:** Summer Peak



Southeastern Regional
TRANSMISSION PLANNING

SOCO to SC – 500MW

Transfer Flow Diagram (% of Total Transfer)



SOCO – SC 500 MW

Transmission System Impacts – *SERTP*

- **Transmission System Impacts Identified:**
  - Southern Company

- **Potential Transmission Enhancements Identified:**
  - Southern Company

SERTP Total ($2022) = $39.2 Million

SOCO – SC 500 MW

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)	$0
PowerSouth (PS)	$0
Southern (SBAA)	$39.2 Million
Tennessee Valley Authority (TVA)	$0
SERTP TOTAL ($2022)	**$39.2 Million**

Significant Constraints Identified – *SOCO*

Table 1: Significant Constraints - SOCO

Potential Enhancement	Limiting Element	Rating (MVA)	Thermal Loadings (%)	
			Without Request	With Request
P1	Hatch – Hatch S.S. 2 230kV T.L.	509	<90	108.2
P1	Hatch S.S. 2 – Vidalia 230kV T.L.	509	<90	107.0
-	Etowah – Reavis Mountain 115kV T.L	124	90.2	98.1

SOCO – SC 500 MW

Potential Enhancements Identified – *SOCO*

Table 2: Potential Enhancements - SOCO

Item	Potential Enhancement	Planning Level Cost Estimate
P1	**Hatch – Vidalia 230kV T.L.** • Rebuild 23.1 miles of 100C 1033.5 ACSR 230kV transmission line on the Hatch – Vidalia 230kV T.L.	**$39.2 Million**
SOCO TOTAL ($2022)		**$ 39.2 Million**(1)

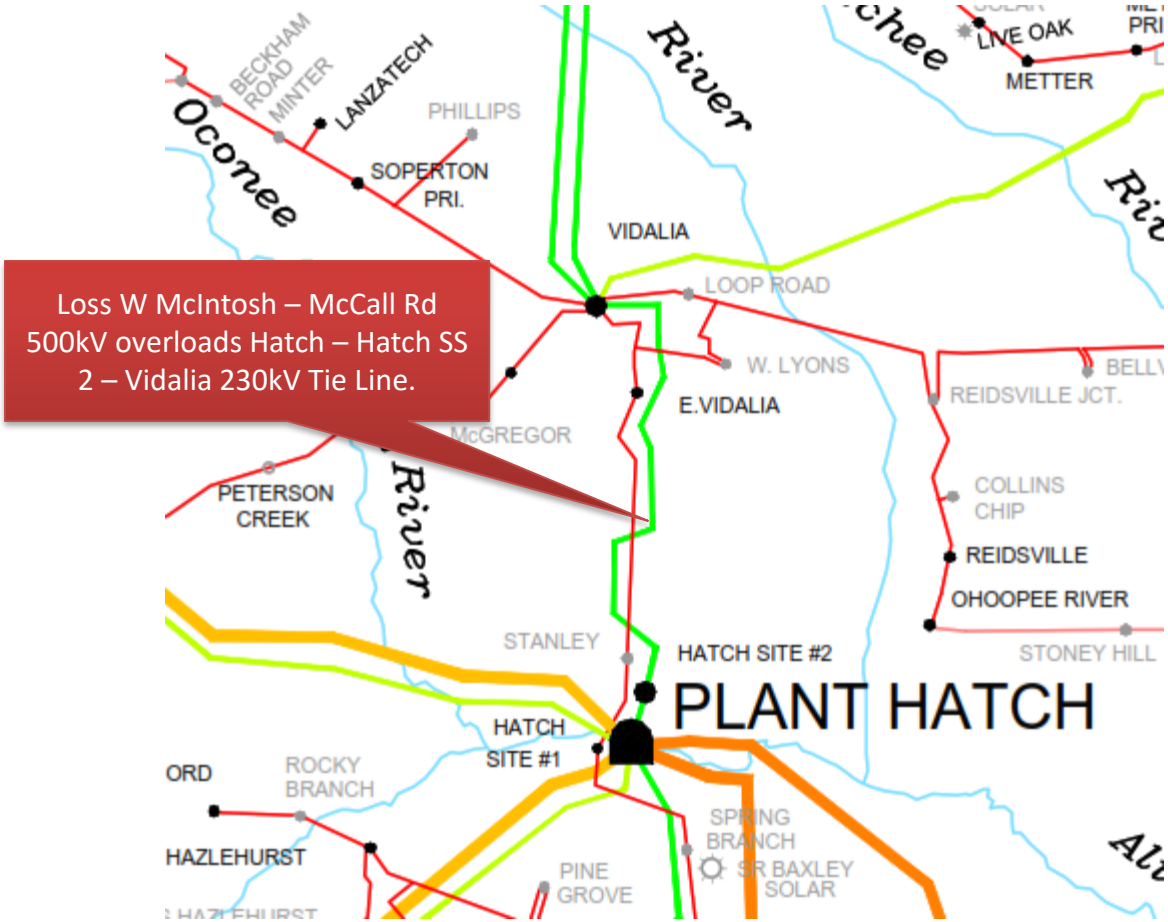
(1) Total planning level cost estimate does not include the cost of projects that are included in SERTP Sponsors' expansion plans and are scheduled to be completed by June 1st of the study year. The studied transfer depends on these projects being in-service, and the cost to support the study transfer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

SOCO – SC 500 MW

Potential Enhancement Locations – *SOCO*

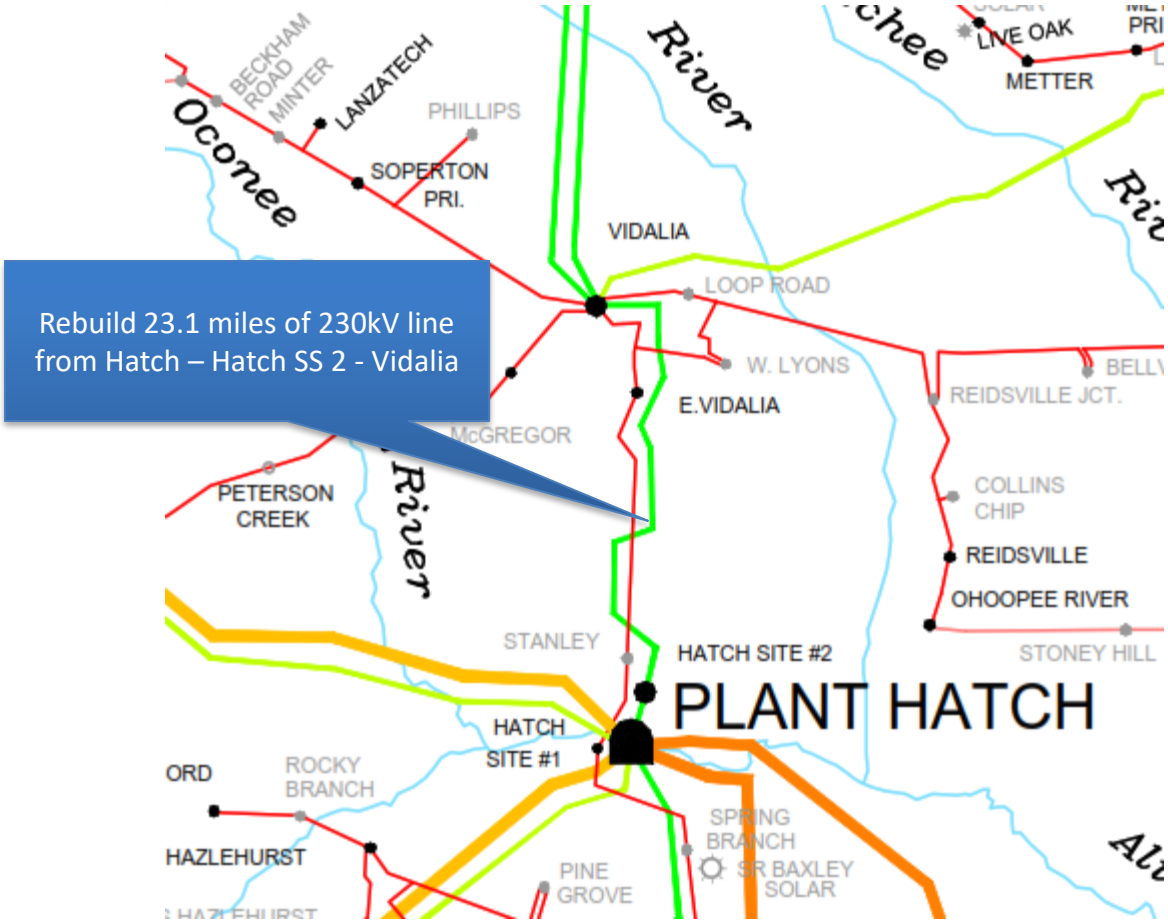
SOCO – SC 500 MW

Significant Constraint (P1) – *SOCO*



SOCO – SC 500 MW

Significant Constraint (P1) – *SOCO*



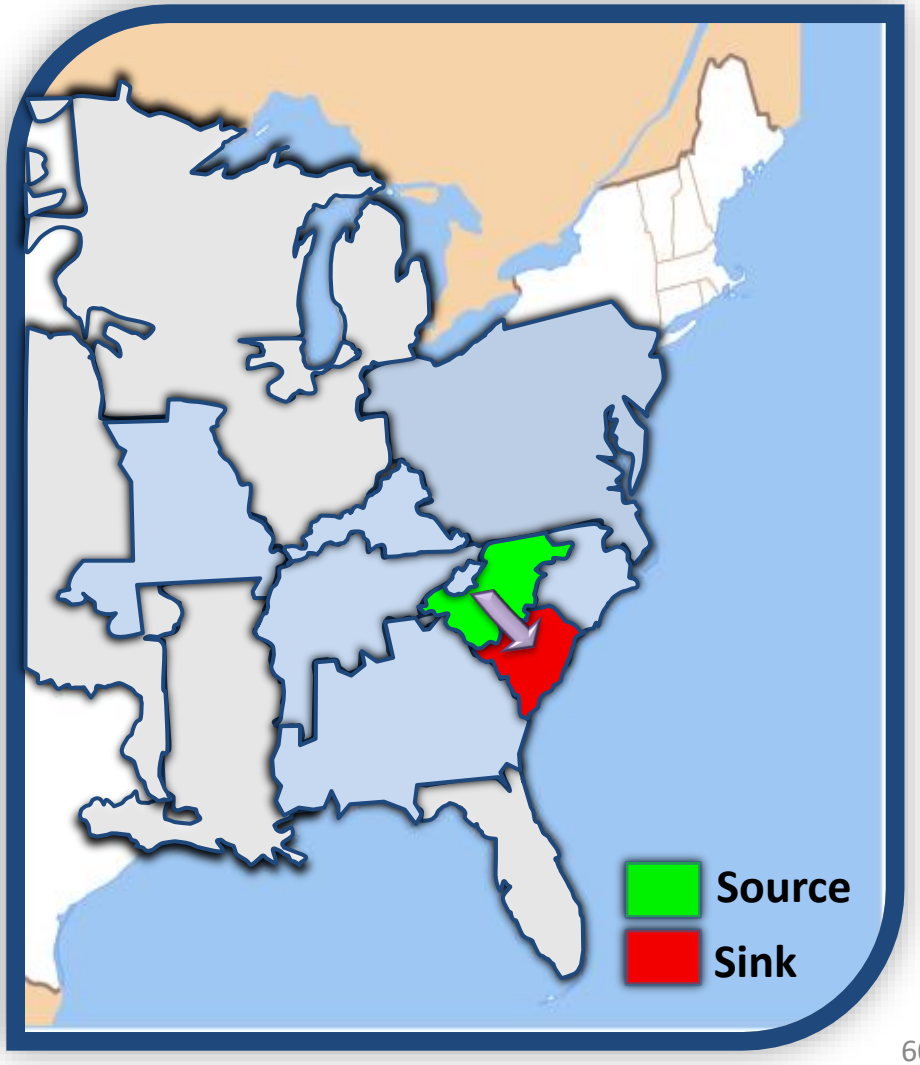
Economic Planning Studies – Preliminary Results

DEC to SC – 600MW

DEC – SC 600 MW

Study Assumptions

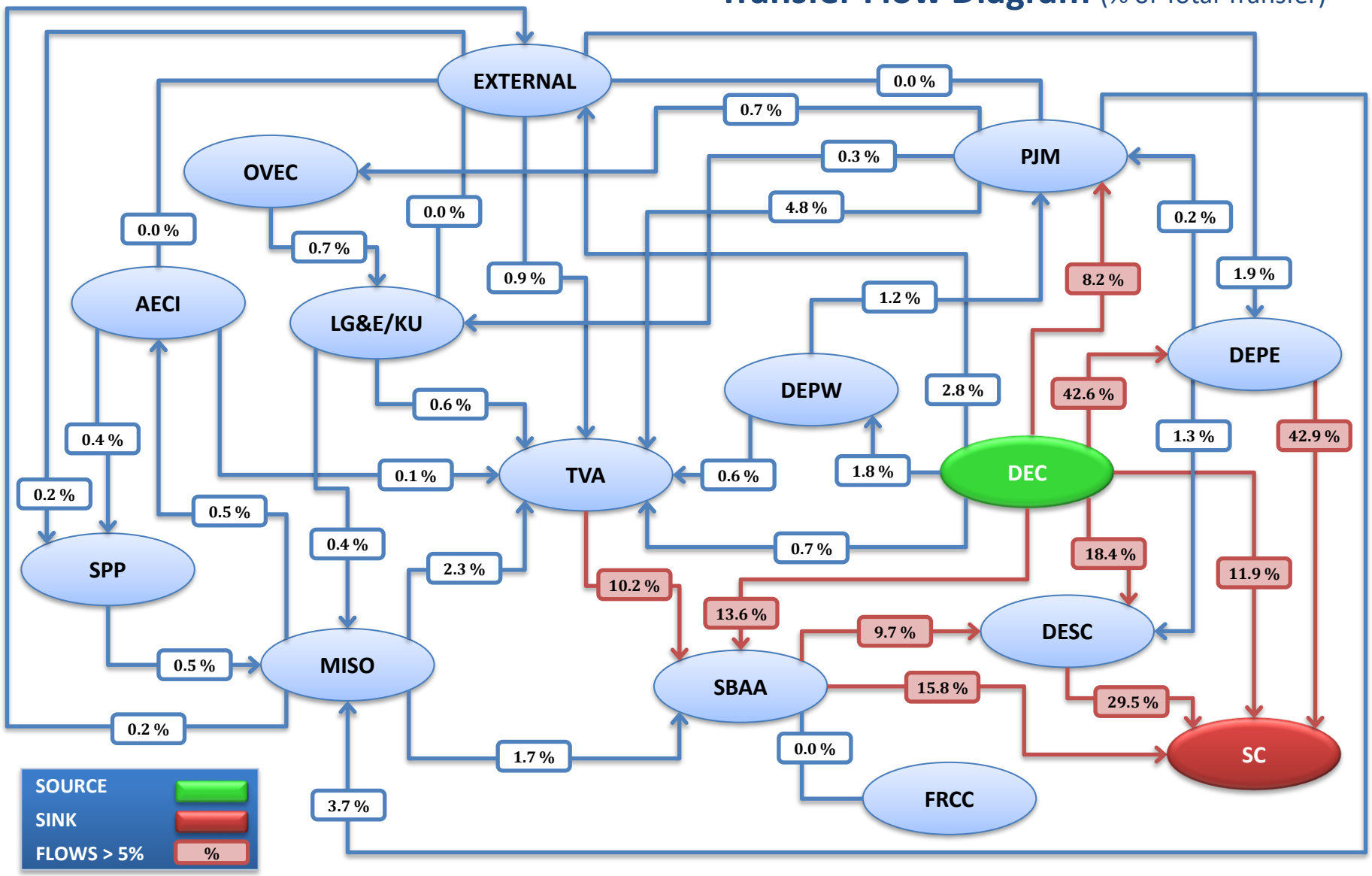
- **Source:** Generation Scale within DEC
- **Sink:** Generation Scale with SC
- **Transfer Type:** Generation to Generation
- **Year:** 2027
- **Load Level:** Winter Peak



Southeastern Regional TRANSMISSION PLANNING

DEC to SC – 600MW

Transfer Flow Diagram (% of Total Transfer)



DEC – SC 600 MW

Transmission System Impacts – *SERTP*

- **Transmission System Impacts Identified:**
  - None Identified

- **Potential Transmission Enhancements Identified:**
  - None Identified

SERTP Total ($2022) = $0

DEC – SC 600 MW

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)	$0
PowerSouth (PS)	$0
Southern (SBAA)	$0
Tennessee Valley Authority (TVA)	$0
SERTP TOTAL ($2022)	**$0**

SERTP

Miscellaneous Updates

10 Year Preliminary Plan Update

- No additional comments on the preliminary 10-year plan been submitted by stakeholders for review by the SERTP
- Sponsors will work to finalize the 10-year plan with any internal updates during the fourth quarter
- Final 10-year plan will be presented in the fourth quarter meeting

Regional Planning Update

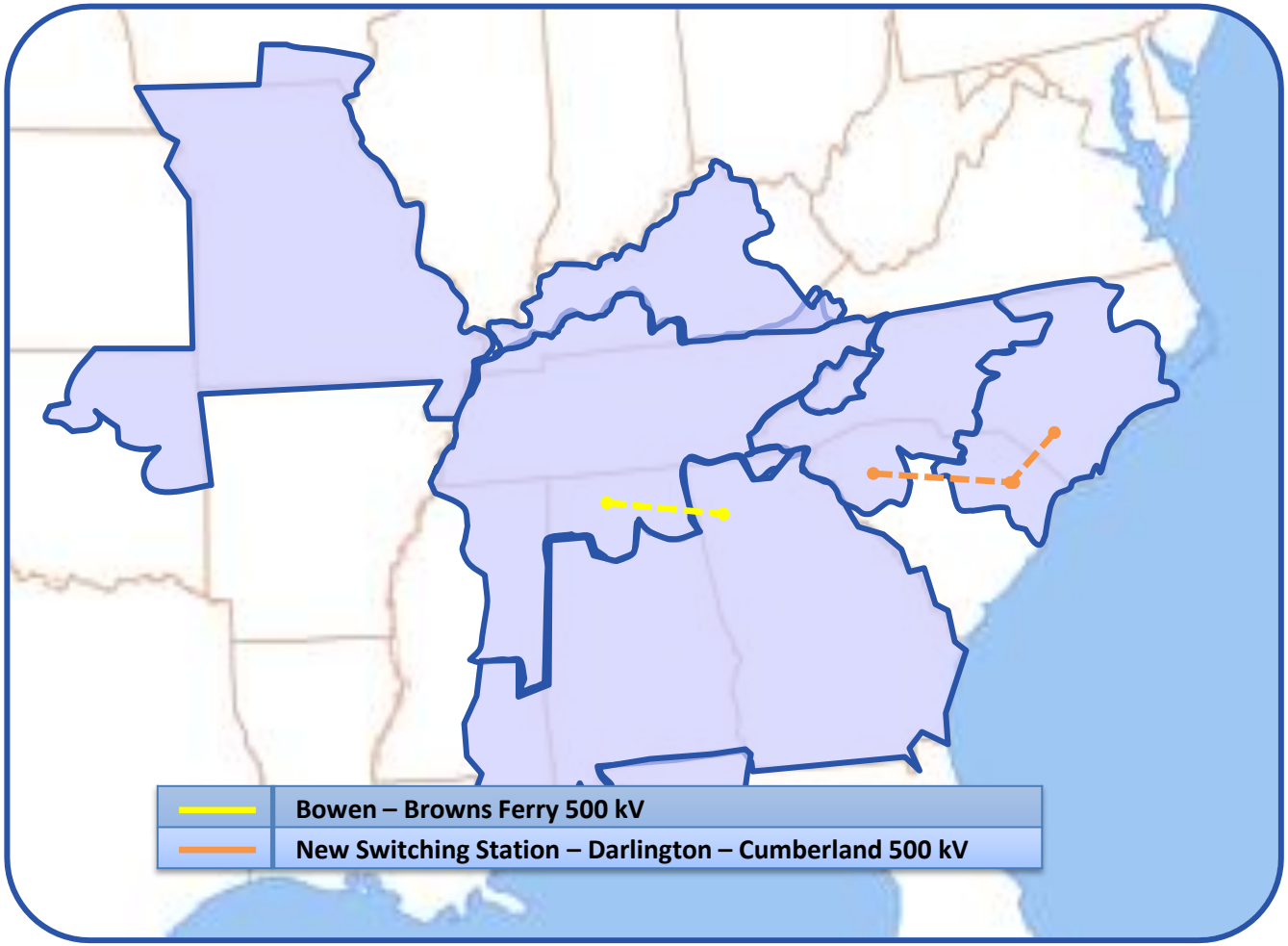
- Version 2 SERTP Regional Models available on SERTP Website

- SERTP has now held interregional data exchange meetings with all neighbors:
  - SCRTP, SPP, MISO, PJM and FRCC

- SERTP Sponsors beginning analyses on regional models including assessment to identify and evaluate potential regional transmission projects

2022 Regional Analyses

List of Alternative Regional Transmission Projects



2022 Regional Analyses

Preliminary List of Alternative Regional Transmission Projects

Alternative Regional Transmission Projects	Miles	From	To
		BAA (State)	BAA (State)
New Station on Oconee to Newport (DEC) – Cumberland (DEP)	200	DEC (SC)	DEP (NC)
Bowen (SOCO) – Browns Ferry (TVA)	175	SOCO (GA)	TVA (AL)

SERC Regional Model Development Update

- SERC is one of the six regional electric reliability councils under the North American Electric Reliability Corporation authority (NERC).

- SERC oversees the implementation and enforcement of Reliability Standards among the bulk power system (BPS) users, owners, and operators.

SERC Regional Model Development Update

- **SERC Regional Model Development**
  - SERC Long-Term Working Group (LTWG)
    - Analyze the performance of the members' transmission systems and identify limits to power transfers occurring non-simultaneously among the SERC members.
    - Evaluate the performance of bulk power supply facilities under both normal and contingency conditions for future years.
  - Data Bank Update (DBU)
    - The DBU is held to conduct an annual update of power flow models for the SERC Region to be used for operating and future year studies.

SERC Regional Model Development Update

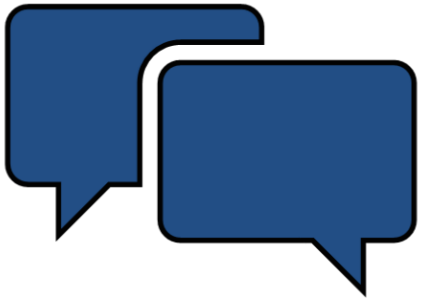
- **SERC Regional Model Development**
  - Eastern Interconnection Reliability Assessment Group (ERAG)
    - The SERC Models are incorporated into the power flow models of the interconnected regions and updated annually by ERAG
    - Responsible for developing a library of solved power flow models of the Eastern Interconnection (Multi-regional Modeling Work Group – MMWG).
    - The updated Regional MMWG Models serve as the starting point model for the SERTP Regional Power Flow Models
    - MOD-32 Compliance (Data for Power System Modeling and Analysis)

SERC Regional Model Development Update

- **SERC Regional Model Development**
  - LTWG Schedule of Events for 2022
    - Data Bank Update (DBU) was finalized in June
    - Power flow cases were finalized in June
    - Future Study Year Case: 2027 Summer Peak Load
      - Nonpublic Study and Report expected to be complete in September
      - Planning Coordination Subcommittee
  - ERAG Schedule of Events for 2022
    - MMWG Model Update performed from August – September
    - Power flow cases expected to be finalized in October

Next Meeting Activities

- **2022 SERTP 4th Quarter Meeting** – *Annual Transmission Planning Summit & Input Assumptions Meeting*
  - **Location: Microsoft Teams**
  - **Date: December 2022**
  - **Purpose:**
    - Final Economic Planning Study Results
    - Final Regional Transmission Plan
    - Regional Analyses Results
    - 2023 Assumptions Input Session



Questions?

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