South Carolina Regional Transmission Planning

Stakeholder Meeting

Web Conference

October 13, 2016 - 10 AM – 11 AM

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Purpose and Goals for Today's Meeting

- Review and Discuss Economic Power Transfer Studies – Initial Results
- Regional Planning Process
- Reliability Assessments and Multi-Party Studies
- EIPC Update

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Economic Transmission Planning Studies

Jeff Neal
Weijian Cong

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Study Methodology

- Linear transfer analysis using PTI's MUST Software. Analysis includes single contingencies of SERC while monitoring the SCE&G and Santee Cooper's internal Transmission Systems.

- A Thermal and Voltage analysis using PTI's PSS/E and/or PowerWorld Simulator Software. This analysis of SCE&G and Santee Coopers internal transmission systems included single contingencies, double contingencies and selected bus outages with and without the simulated transfer in effect. However, this analysis is not a complete testing of NERC TPL standards.

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Case Development

- The most current MMWG models were used for the systems external to SCE&G and SCPSA as a starting point for the study case.

- The study case(s) include the detailed internal models for SCE&G and SCPSA. The study case(s) include new transmission additions currently planned to be in-service for the given year (i.e. in-service by winter 2017 for 2017W case).

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Case Development

- SCE&G and SCPSA have coordinated interchange which includes all confirmed long term firm transmission reservations with roll-over rights applicable to the study year.
- The coordinated cases were used to build base cases.
- Base cases were used to build transfer cases.

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Study Results

- SCE&G and SCPSA have reported results based on thermal loading greater than 90% and voltage violations in accordance with their planning criteria.

- Overloaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were also excluded.

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2016 Economic Planning Scenarios

Selected by Stakeholders During the March 16, 2016 Meeting

Source	Sink	Study Year	Transfer
Southern Company	Santee Cooper	2017 Winter	500 MW
Santee Cooper	Georgia Transmission Company	2017 Summer	200 MW
Santee Cooper	Georgia Transmission Company	2017 Winter	200 MW
Santee Cooper	Duke Energy Progress (CP&LE)	2017 Winter	300 MW
Southern Company	Santee Cooper/SCE&G	2020 Summer	500 MW

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Power Flow Base Cases

- 2015 LTSG Series Internal PSSE Models
  - 2017 Summer
  - 2017 Winter
  - 2020 Summer

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Preliminary Result Components

- The following information is preliminary and subject to change pursuant to additional analyses.
- The following 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 respective areas that comprise the SCRTP. Balancing Areas external to the SCRTP were not monitored, which could result in additional limitations and required system enhancements.

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Scenario 1

2017 Winter

SOCO – SCPSA 500 MW

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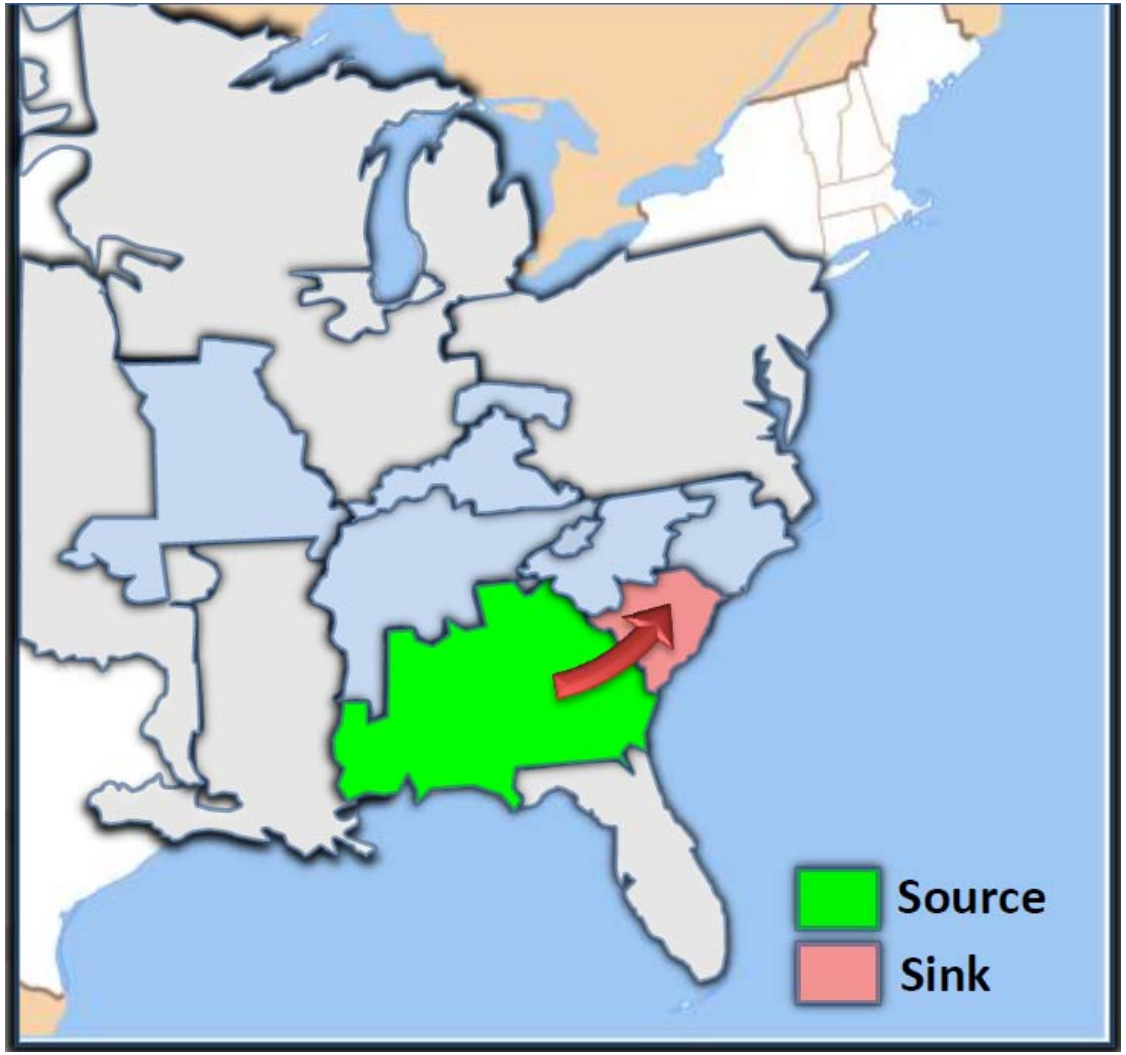
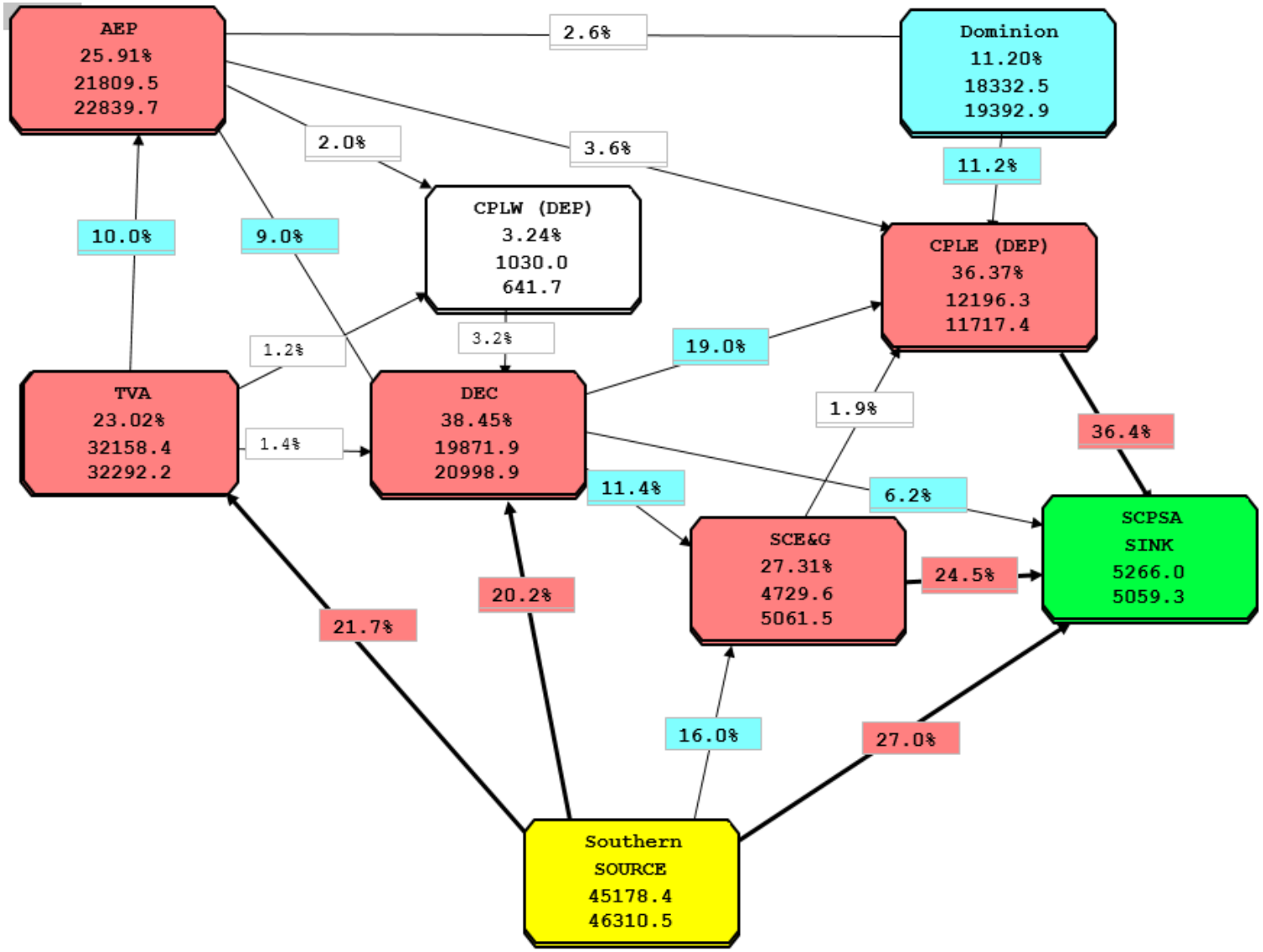
2017 Winter Study
SOCO – SCPSA 500 MW



2017 Winter Study
SOCO – SCPSA 500 MW



Preliminary Results – SCE&G

Southern Company-SCPSA 500 MW
2017 Winter Study

Constrained Facility	Loading %	Increase %	Contingency	Project
*None Identified	---	---		---

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – SCE&G

Southern Company-SCPSA 500 MW
2017 Winter Study

Project	Description	Cost (2016$)	Duration (Months)
*None Identified		N/A	N/A
	TOTAL (2016$)	$0	

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – SCPSA

Southern Company-SCPSA 500 MW
2017 Winter Study

Constrained Facility	Loading %	Increase %	Contingency	Project
*None Identified	---	---		---

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – SCPSA

Southern Company-SCPSA 500 MW
2017 Winter Study

Project	Description	Cost (2016$)	Duration (Months)
*None Identified		N/A	N/A
	TOTAL (2016$)	$0	

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Scenario 2

2017 Summer

SCPSA – GTC 200 MW

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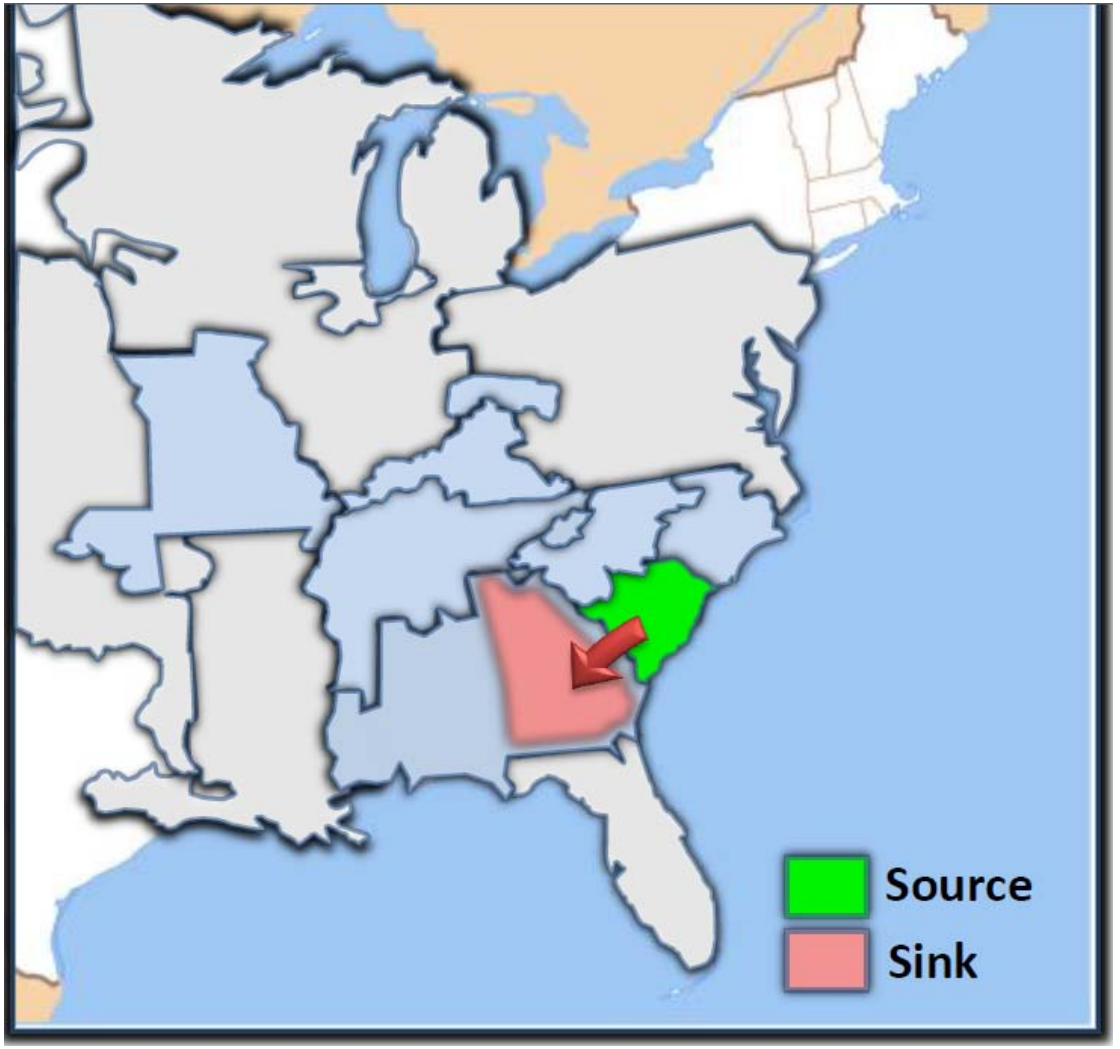
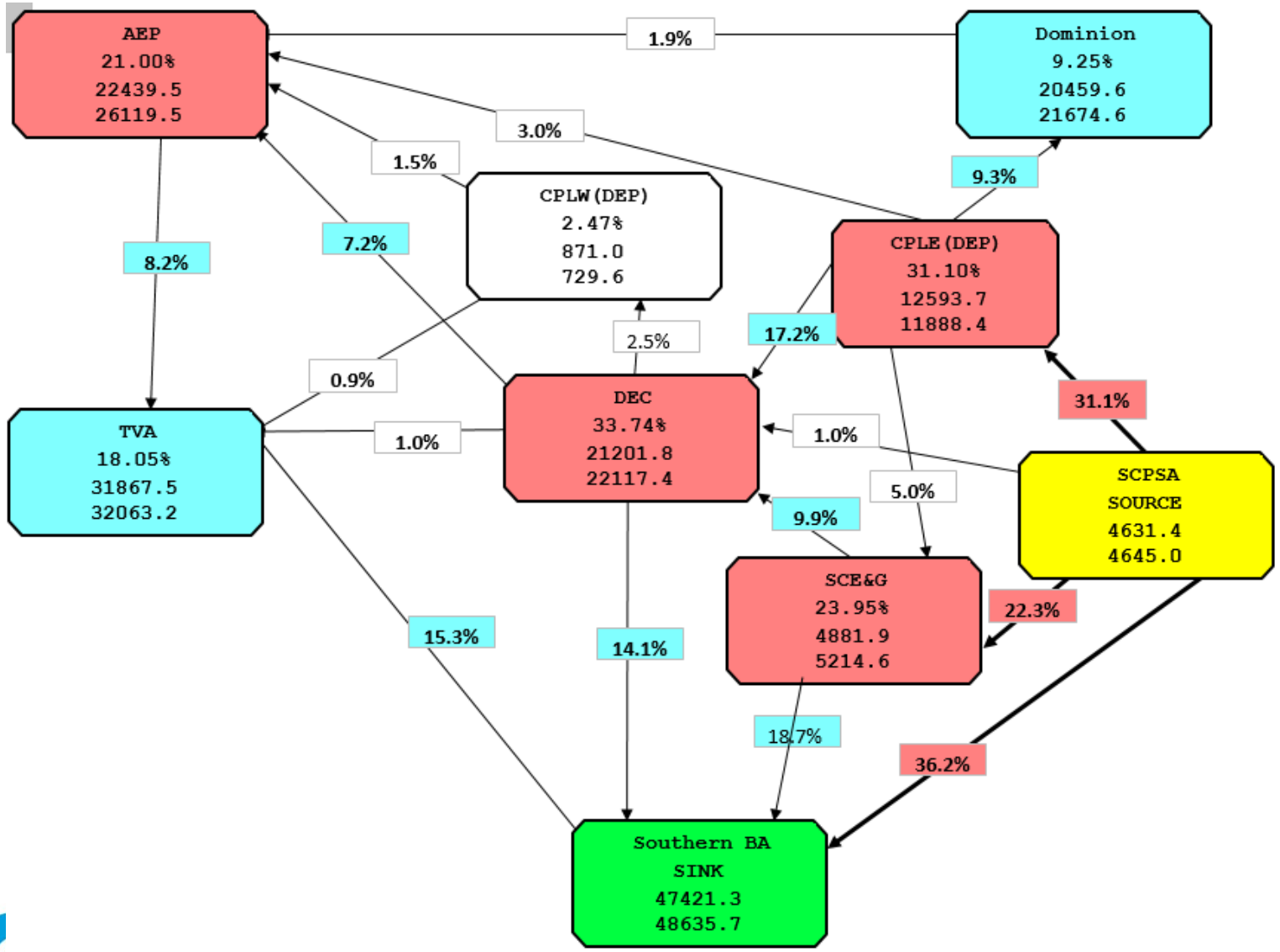
2017 Summer Study
SCPSA – GTC 200 MW



2017 Summer Study
SCPSA – GTC 200 MW



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Preliminary Results – SCE&G

SCPSA – GTC 200 MW
2017 Summer Study

Constrained Facility	Loading %	Increase %	Contingency	Project
*None Identified	---	---		---

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – SCE&G

SCPSA – GTC 200 MW
2017 Summer Study

Project	Description	Cost (2016$)	Duration (Months)
*None Identified		N/A	N/A
	TOTAL (2016$)	$0	

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Preliminary Results – SCPSA

SCPSA – GTC 200 MW
2017 Summer Study

Constrained Facility	Loading %	Increase %	Contingency	Project
*None Identified	---	---		---

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – SCPSA

SCPSA – GTC 200 MW
2017 Summer Study

Project	Description	Cost (2016$)	Duration (Months)
*None Identified		N/A	N/A
	TOTAL (2016$)	$0	

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Scenario 3

2017 Winter

SCPSA – GTC 200 MW

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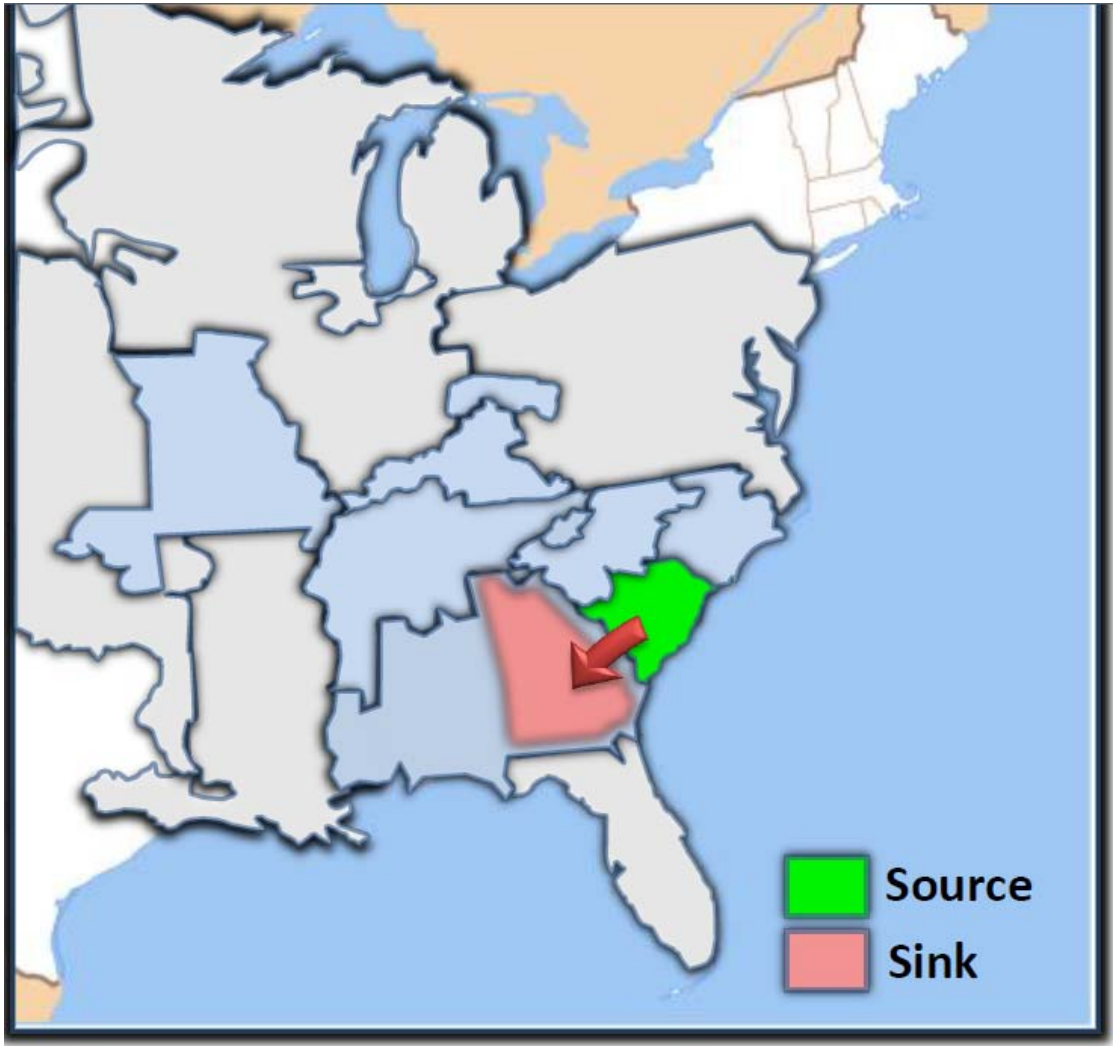
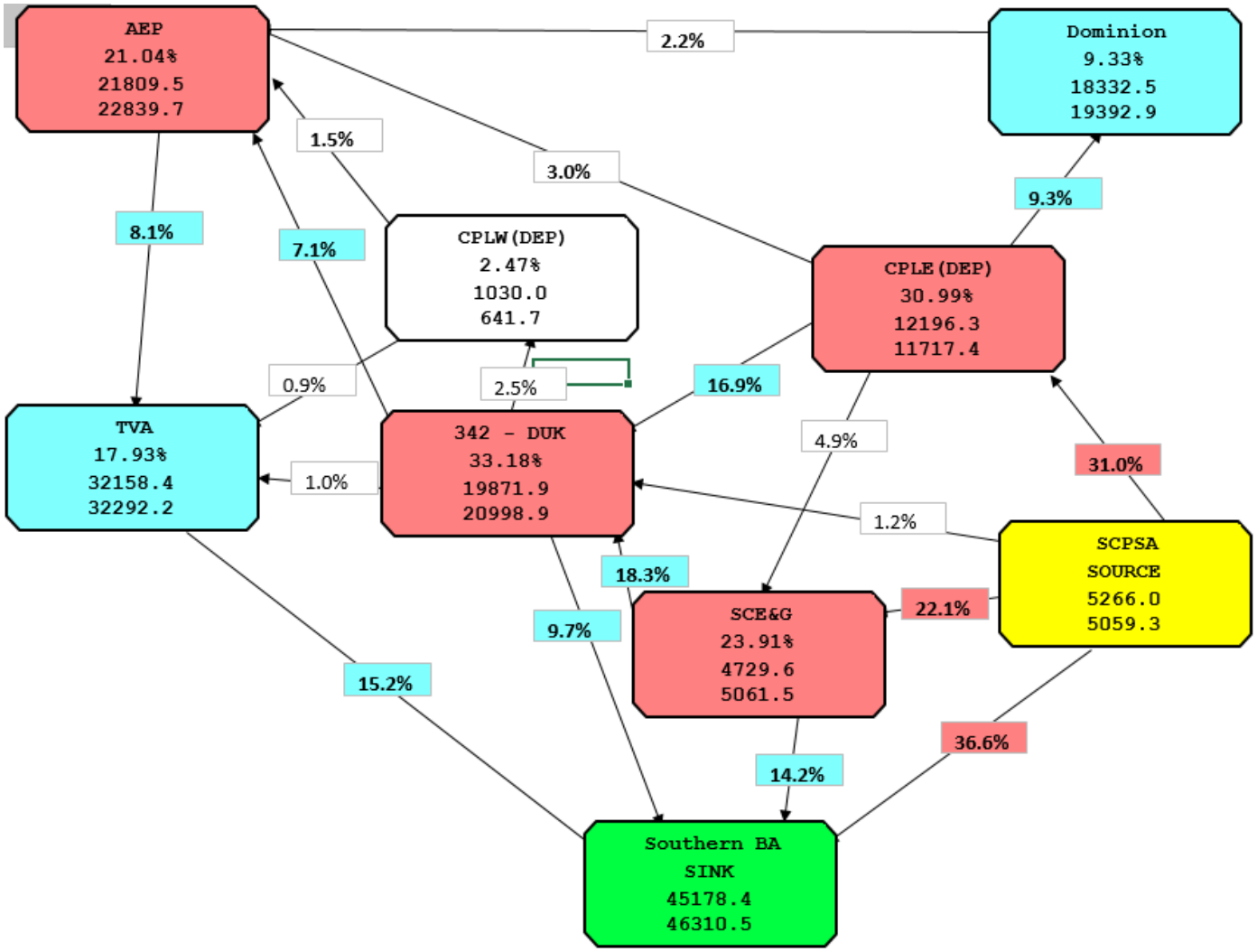
2017 Winter Study
SCPSA – GTC 200 MW



2017 Winter Study
SCPSA – GTC 200 MW



Preliminary Results – SCE&G

SCPSA – GTC 200 MW
2017 Winter Study

Constrained Facility	Loading %	Increase %	Contingency	Project
*None Identified	---	---		---

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – SCE&G

SCPSA – GTC 200 MW
2017 Winter Study

Project	Description	Cost (2016$)	Duration (Months)
*None Identified		N/A	N/A
	TOTAL (2016$)	$0	

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Preliminary Results – SCPSA

SCPSA – GTC 200 MW
2017 Winter Study

Constrained Facility	Loading %	Increase %	Contingency	Project
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Preliminary Results – SCPSA

SCPSA – GTC 200 MW
2017 Winter Study

Project	Description	Cost (2016$)	Duration (Months)
*None Identified		N/A	N/A
	TOTAL (2016$)	$0	

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Scenario 4

2017 Summer

SCPSA – CPLE(DEP) 300 MW

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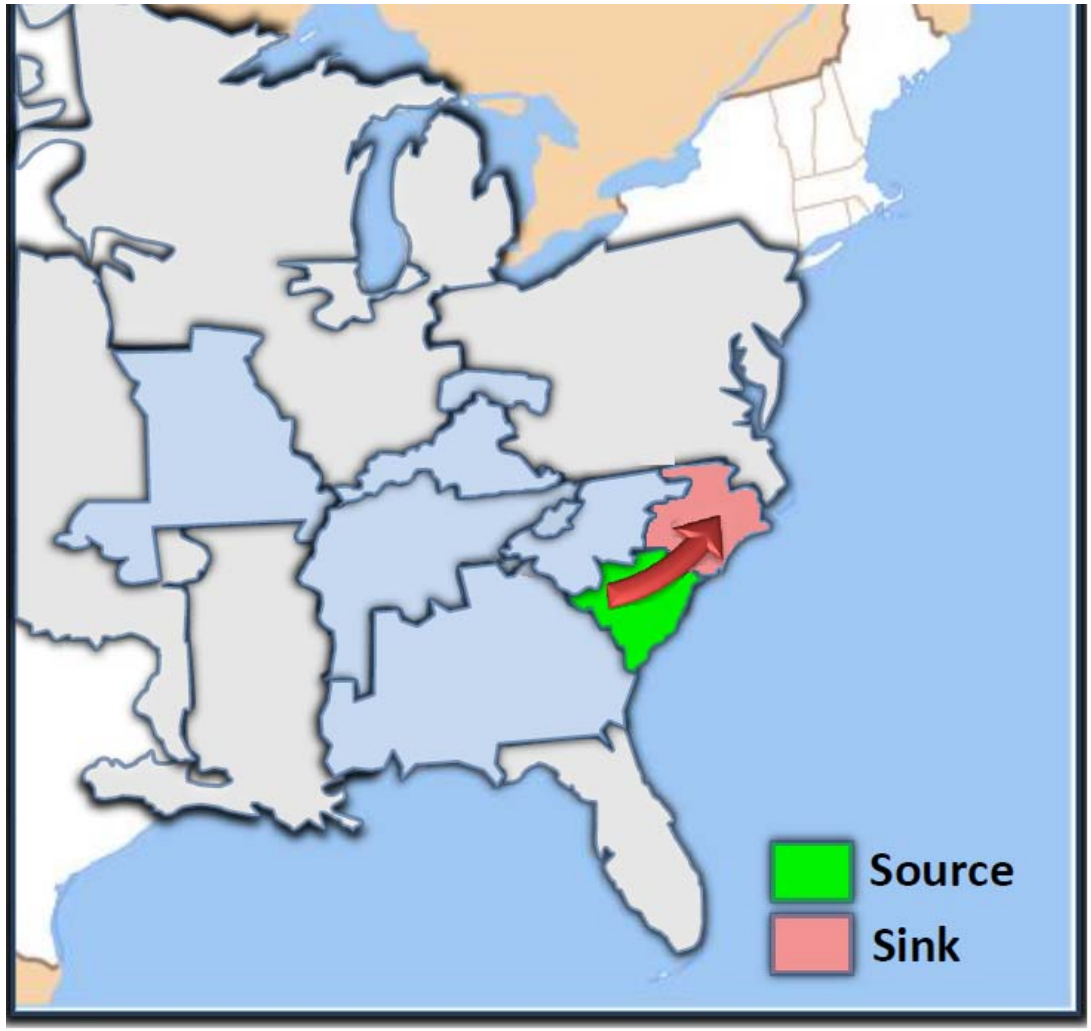
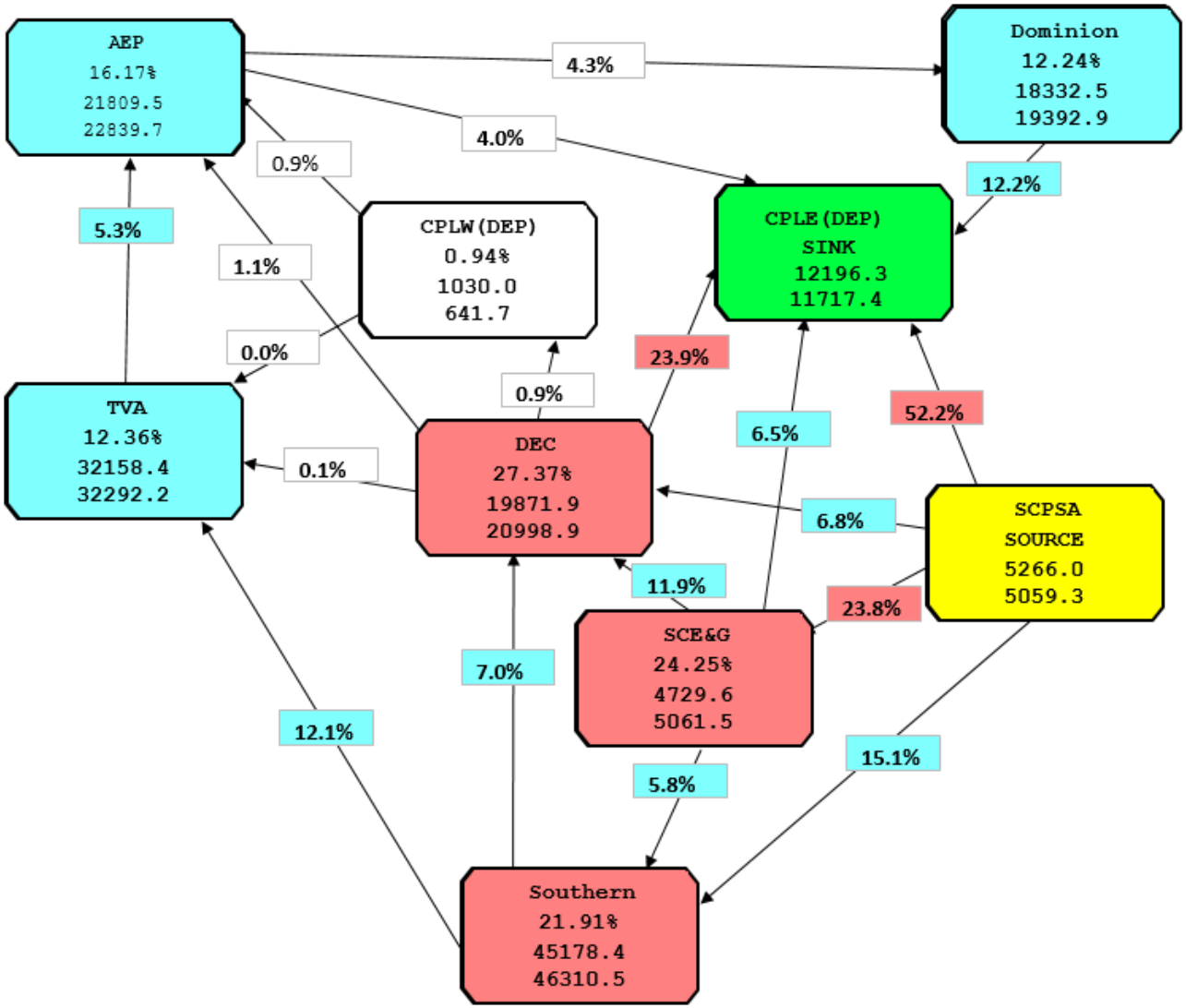
2017 Winter Study
SCPSA – CPLE(DEP) 300 MW



2017 Winter Study
SCPSA – CPLE(DEP) 300 MW



Preliminary Results – SCE&G

SCPSA – CPLE(DEP) 300 MW

2017 Winter Study

Constrained Facility	Loading %	Increase %	Contingency	Project
*None Identified	---	---		---

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – SCE&G

SCPSA – CPLE(DEP) 300 MW

2017 Winter Study

Project	Description	Cost (2016$)	Duration (Months)
*None Identified		N/A	N/A
	TOTAL (2016$)	$0	

*Potentially overloaded or loaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were excluded

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Preliminary Results – SCPSA

SCPSA – CPLE(DEP) 300 MW

2017 Winter Study

Constrained Facility	Loading %	Increase %	Contingency	Project
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Preliminary Results – SCPSA

SCPSA – CPLE(DEP) 300 MW

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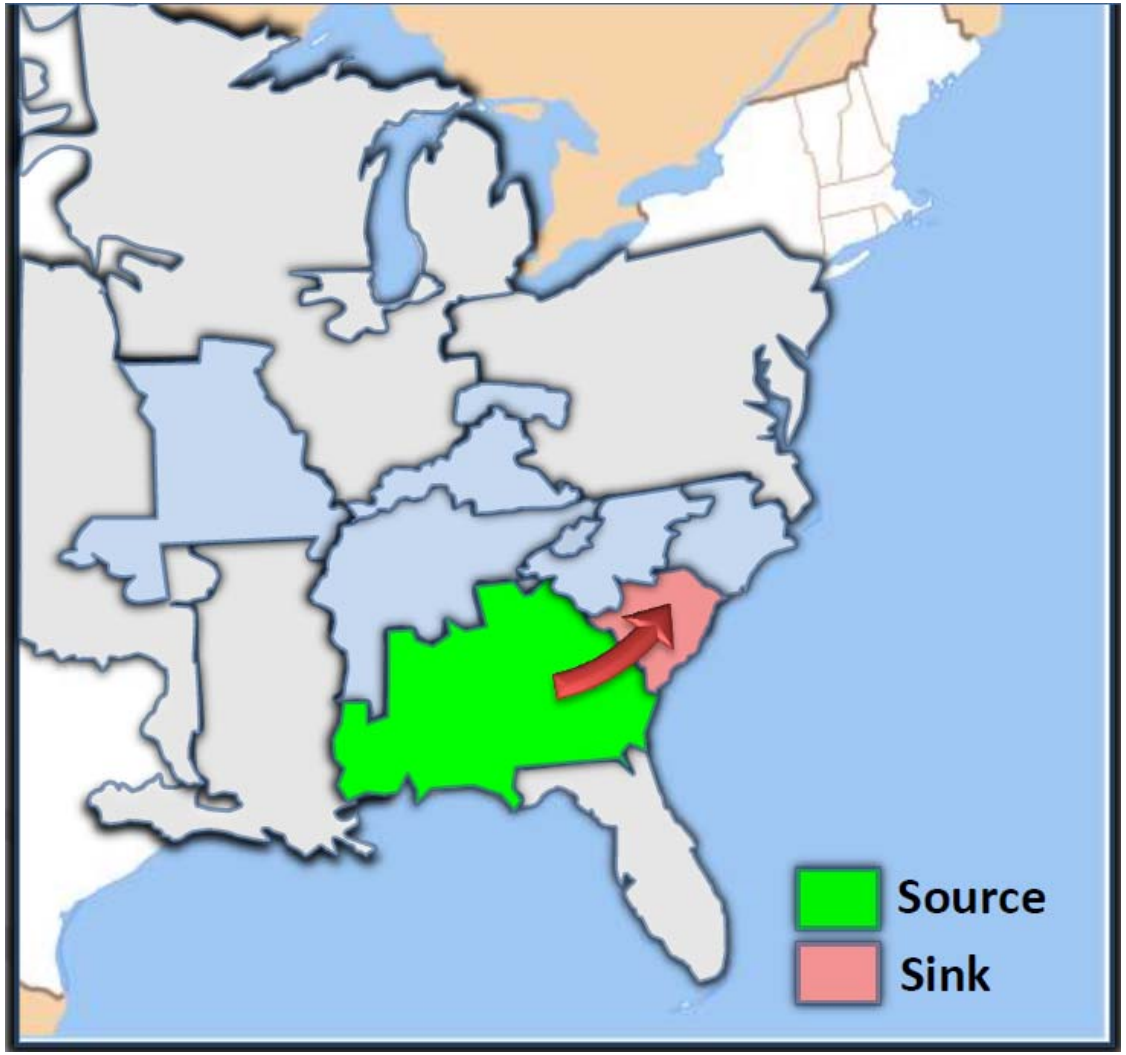
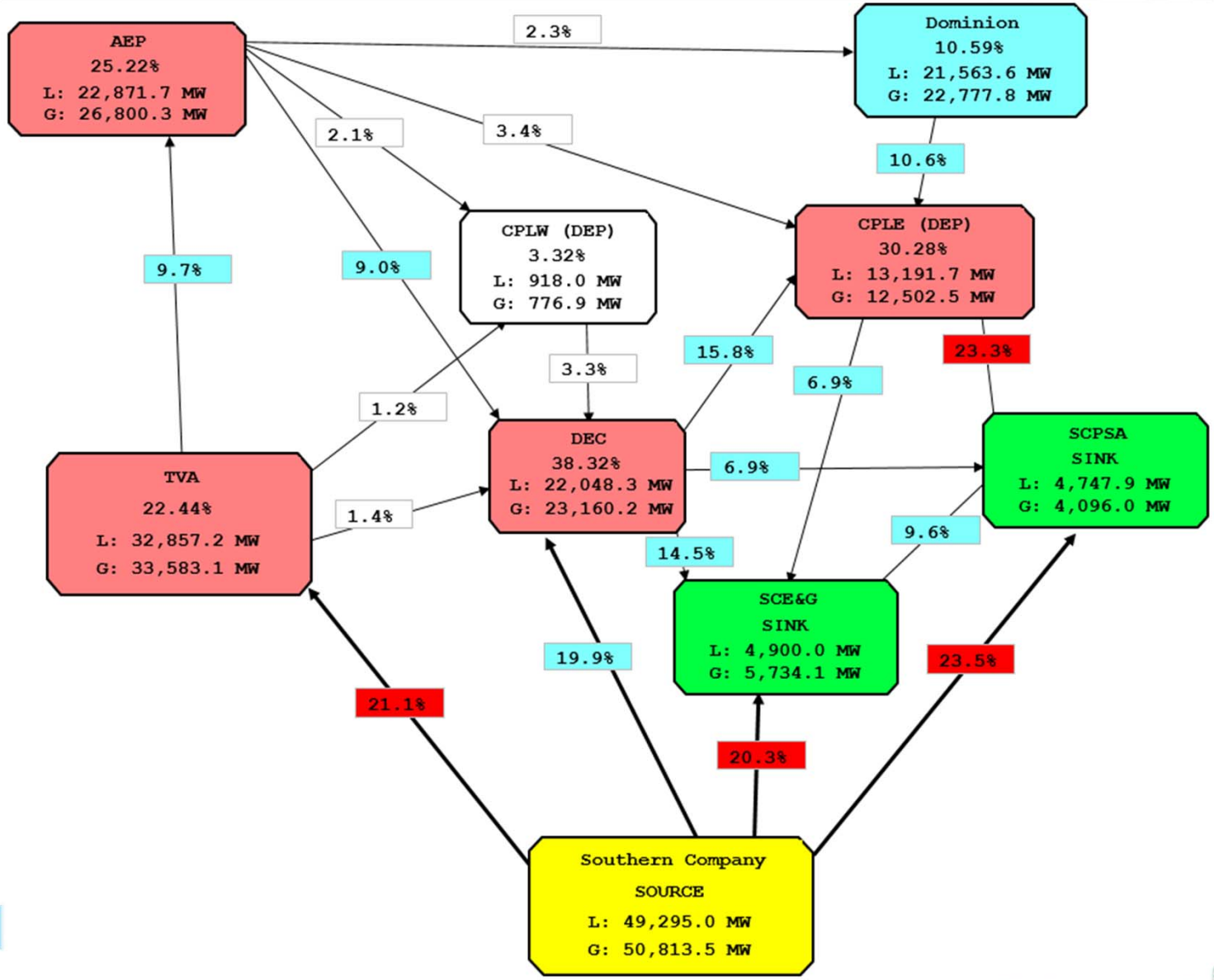
2020 Summer Study
SOCO – SCE&G/SCPSA 500 MW



2020 Summer Study
SOCO – SCE&G/SCPSA 500 MW



Preliminary Results – SCE&G

SOCO – SCE&G/SCPSA 500 MW

2020 Summer Study

Constrained Facility	Loading %	Increase %	Contingency	Project
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Preliminary Results – SCE&G

SOCO – SCE&G/SCPSA 500 MW
2020 Summer Study

Project	Description	Cost (2016$)	Duration (Months)
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Preliminary Results – SCPSA

SOCO – SCE&G/SCPSA 500 MW

2020 Summer Study

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Preliminary Results – SCPSA

SOCO – SCE&G/SCPSA 500 MW

2020 Summer Study

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2016 Economic Planning Scenarios

Preliminary Results - SCPSA

#	Source	Sink	MW	Year	FCITC LIMIT	LIMIT/CONTINGENCY
1	SOCO	SC	500	2017W	No Limit found	N/A
2	SC	GTC	200	2017S	No Limit found	N/A
3	SC	GTC	200	2017W	No Limit found	N/A
4	SC	CPLE	300	2017W	No Limit found	N/A
5	SOCO	SC/SG*	500	2020S	No Limit found	N/A

*SCENARIO 5: SC and SG each share 250 MW import

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2016 Economic Planning Scenarios

Preliminary Results – SCE&G

#	Source	Sink	MW	Year	FCITC LIMIT	LIMIT/CONTINGENCY
1	SOCO	SC	500	2017W	No Limit found	N/A
2	SC	GTC	200	2017S	No Limit found	N/A
3	SC	GTC	200	2017W	No Limit found	N/A
4	SC	CPLE	300	2017W	No Limit found	N/A
5	SOCO	SC/SG*	500	2020S	No Limit found	N/A

*SCENARIO 5: SC and SG each share 250 MW import

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Report and Power Flow Case Access

- Draft reports will be provided to stakeholders
- Power Flow Starting Point Cases available as of September 1, 2016

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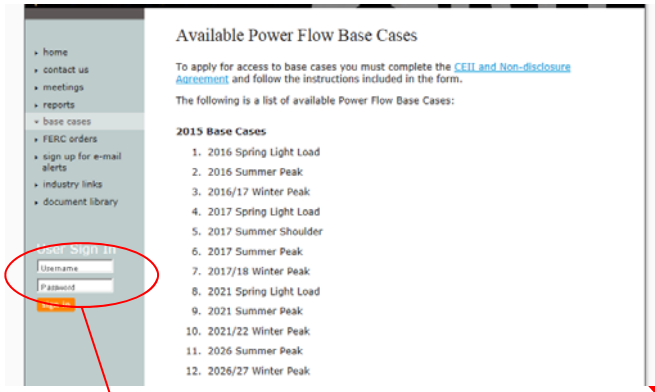
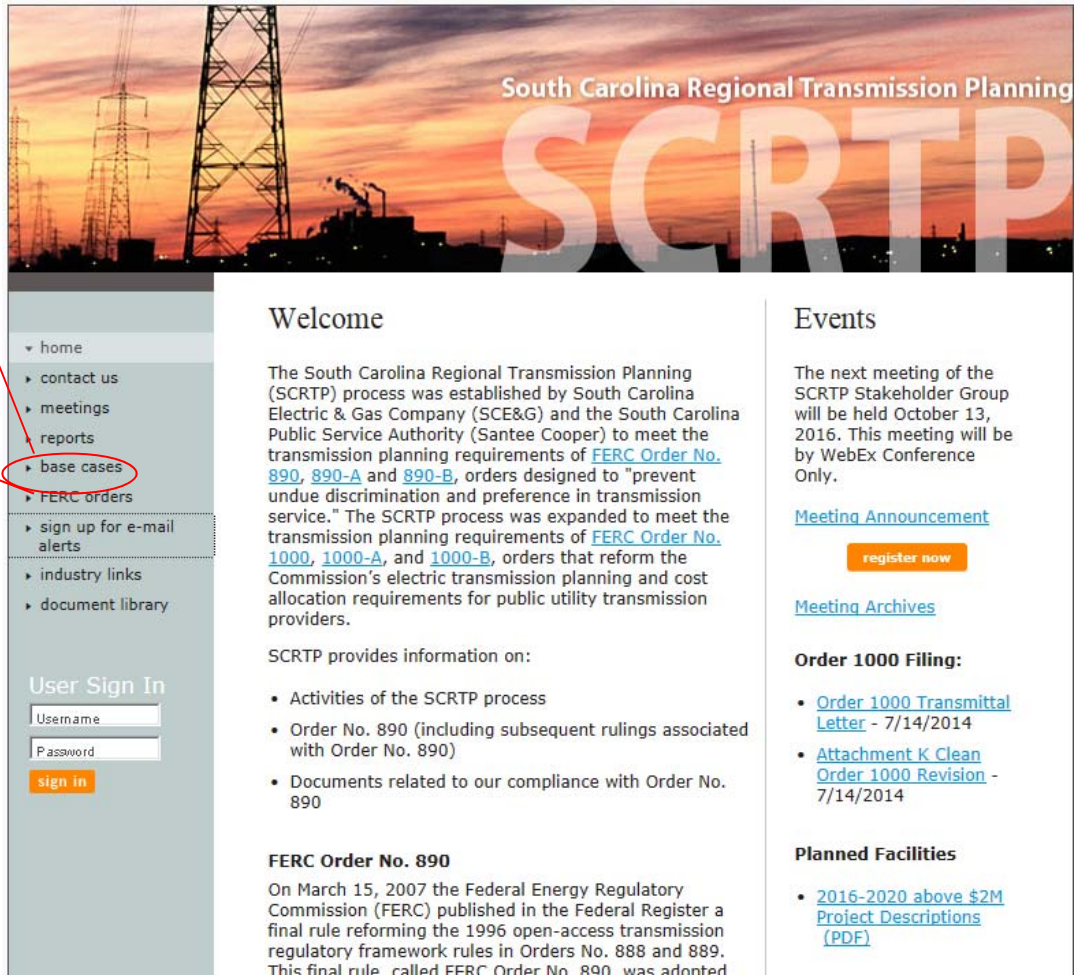
https://www.SCRTP.com/home





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Economic Transmission Planning Studies Initial Findings

Stakeholder Input, Comments and Questions

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SCRTP Regional and Inter-regional Processes

Clay Young

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SCRTP Regional and Public Policy Planning

- Biennial Process (currently in year 2, Meeting #8)
- Restarts in 4th quarter of even years
- Regional Projects – Proposed, Evaluation and Selection
  - Must be submitted by January 15 of odd years
  - None received in current Regional Planning cycle

When proposals are submitted, during this meeting

- The Transmission Providers announce proposed Regional Projects selected for inclusion in the Regional Transmission Plan.

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SCRTP Regional and Public Policy Planning

- Public Policy – Proposed, Evaluation and Selection
  - Must be submitted by January 15 of odd years
  - None received in current Public Policy Planning cycle

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SCRTP Regional and Public Policy Planning

- Regional Project (definition):

  A project proposed for purposes of regional cost allocation that meets the criteria listed in Section VII.A.

- Section VII.A states a proposed Regional Project:
  - Must operating at 230 kV or above
  - Must be beneficial to more than one system in SCRTP
  - Must not be an upgrade to an existing facility
  - Qualified Developer must secure its own ROW
  - Must be materially different from projects that are currently in the Regional Transmission Plan or the current Local Transmission Plan

- Must be submitted by January 15 of odd years

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SCRTP Regional and Public Policy Planning

- Qualified Developer (definition):

  A Developer that has been selected as eligible to request cost allocation for a proposed Regional Project pursuant to the criteria of Section VII.E.

- Section VII.E states a Qualified Developer seeking regional cost allocation for a proposed Regional Project:
  - Must meet financial and technical criteria (discussed in detail in the OATT)
  - Must submit a Completed Qualification Application and demonstrate the financial and technical capability to develop the proposed Regional Project

- Qualified Developer that intends to develop a proposed Regional Project must establish its eligibility before submitting the project (January 15 of odd years)

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SCRTP Inter-regional Process

- Inter-regional process includes SCRTP and SERTP (Southeastern Regional Transmission Planning)
- Includes requirement to:
  - Coordinate Regional and Local Plans
  - Exchange data, power flow base cases and transmission expansion plans
  - Joint Evaluation of Proposed Inter-regional Projects
  - Cost Allocation Methodology for selected Inter-regional Projects

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Reliability Assessment and Multi-Party Studies

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Multi-Party Assessments

- Carolina Transmission Coordination Arrangement (CTCA) Assessments
- Southeastern Electric Reliability Corporation (SERC) Assessments

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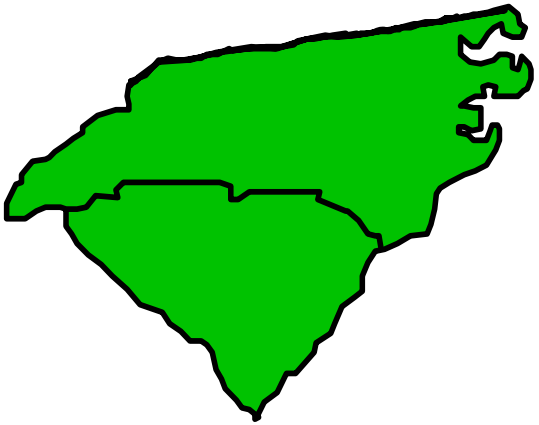
CTCA Future Year Assessments



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CTCA Purpose

- Collection of agreements developed concurrently by the Principals, Planning Representatives, and Operating Representatives of multiple two-party Interchange Agreements

- Establishes a forum for coordinating certain transmission planning and assessment and operating activities among the specific parties associated with the CTCA

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CTCA Power Flow Study Group

- Duke Energy Carolinas (“Duke”)
- Duke Energy Progress (“Progress”)
- South Carolina Electric & Gas (“SCEG”)
- South Carolina Public Service Authority (“SCPSA”)

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CTCA Studies

- Assess the existing transmission expansion plans of Duke, Progress, SCEG, and SCPSA to ensure that the plans are simultaneously feasible.
- Identify any potential joint solutions that are more efficient or cost-effective than individual company plans, which also improve the simultaneous feasibility of the Participant companies' transmission expansion plans.
- The Power Flow Study Group ("PFSG") will perform the technical analysis outlined in this study scope under the guidance and direction of the Planning Committee ("PC").

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CTCA Studies
2016 Study

- 2018 Winter (Near Term)
- 2022 Summer (Long Term)

- Report completion in December, 2016

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SERC LTSG Assessments

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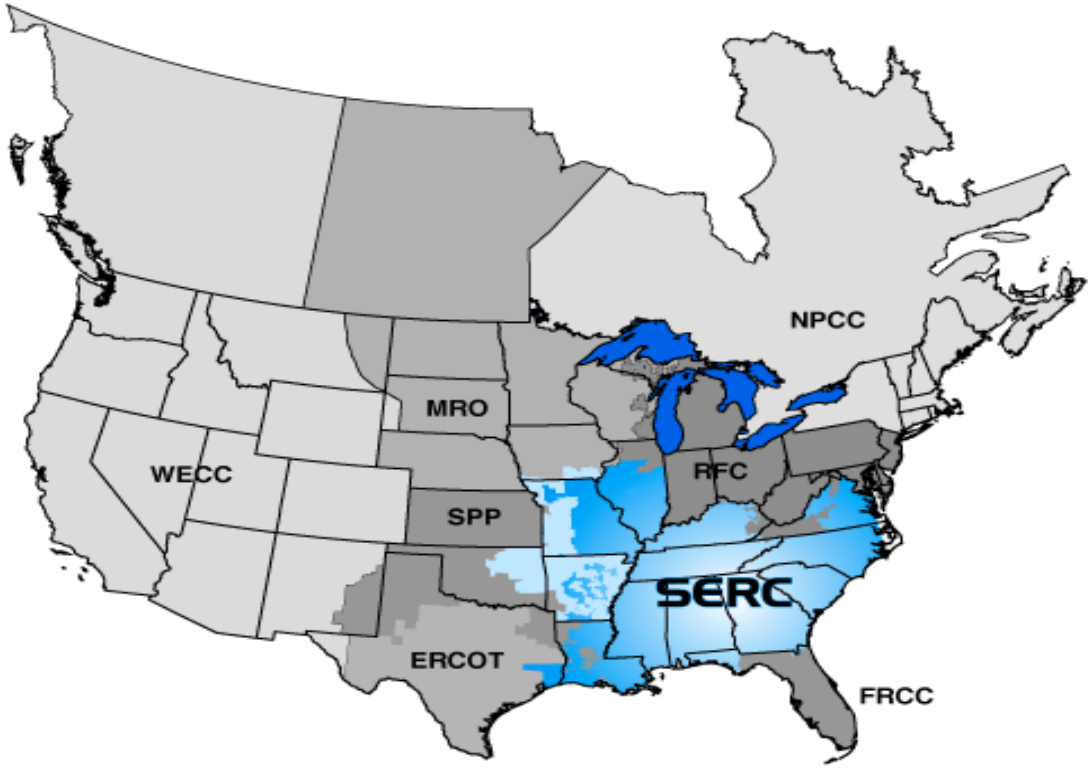
SERC Future Year Assessments
Long Term Study Group (LTSG)



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SERC LTSG Study
Purpose

- 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.
- Focus on the evaluation of sub-regional and company-to-company transfer capability.

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SERC Long Term Study Group
2016 Work Schedule

- LTSG Data Bank Update –May 24-26 Hosted by Southern
- Study Case: 2021 Summer Peak Load
- Work completed by LTSG June thru October
- Final Report in December

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Questions?

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Eastern Interconnection Planning Collaborative Update

Phil Kleckley

SCE&G SM
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EIPC Stakeholder Process

- Existing stakeholder groups previously created for other purposes such as compliance with FERC Order 890 and FERC Order 1000 will used to facilitate stakeholder input

- Ensure a regional focus:
  - Present roll-up models and results
  - Receive stakeholder feedback, input, comments and suggestions on specific scenarios to be studied
  - Present the results of scenario studies
  - Seek stakeholder feedback on reports that are created

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EIPC 2016 Fall Webinars

- Joint EIPC/Eastern Interconnection States' Planning Council (EISPC) Webinars planned for Fall, 2016 in lieu of EIPC Inter-Regional study
- Will present an overview of each Regional Planning process
- Will present an overview of each FERC Order 1000 Inter-Regional Planning process and results
- Will provide and opportunity for Q&A and discussion

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EIPC 2016 Fall Webinars

- Presentation materials to be posted on EIPC website
- Website: www.eipconline.com
- Information on Webinar dates, registration, and access to be provided to SCRTP stakeholders when available

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Questions?

Contact Phil Kleckley

pkleckley@scana.com

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Next SCRTP Meeting

- Key assumptions and data used for modeling
- Reliability Planning process
- Review all major projects included in current Local Transmission Plans
- SCRTP Email Distribution List will be notified
- Register online

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