

South Carolina Regional Transmission Planning

SCRTP

South Carolina Regional Transmission Planning

Stakeholder Meeting

Columbia Metropolitan Convention Center

Columbia, SC

June 16, 2008



Spring Stakeholder Meeting

- SCRTP will review the results of
 - the most recent VACAR, SERC, and ERAG reliability studies
 - New Transmission Investment in the Southeast
- SCRTP Stakeholder Group will identify Economic Power Transfers to be Studied



SCRTP Stakeholder Group

Tom Abrams

Stakeholder Group (8 Sectors)

- Cooperatives

David A. Springs, Jr., Central Electric

John Boyt, New Horizon Electric

- Municipals

John Bagwell, Orangeburg DPU

Alan Loveless, City of Georgetown

- Network and PTP Transmission Customers

J. W. Smith, Southeastern Power Administration

Andy Fusco, ElectriCities of North Carolina

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Stakeholder Group (8 Sectors)

- Generation Owners / Developers
Victor Shaw, Calpine, Columbia Energy Center
- Marketers
Eddie Folsom, SCE&G Power Marketing
David O'Dell, Santee Cooper
- Transmission Owners
Ed Ernst, Duke Energy-Carolinas
Matt Pieper, Southern Company Transmission

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Stakeholder Group (8 Sectors)

- ISO / RTO
- Regulatory

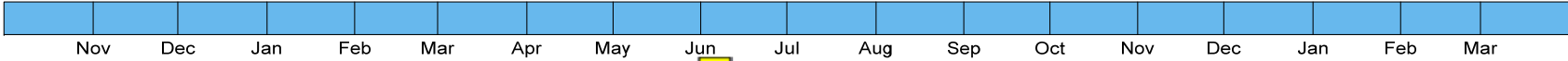
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Overall Planning Cycle

Tom Abrams

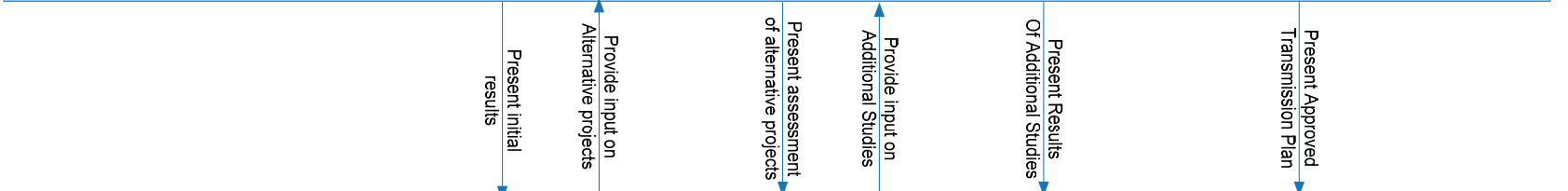
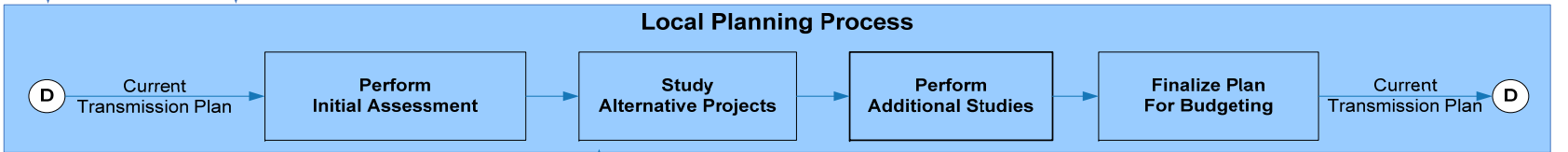
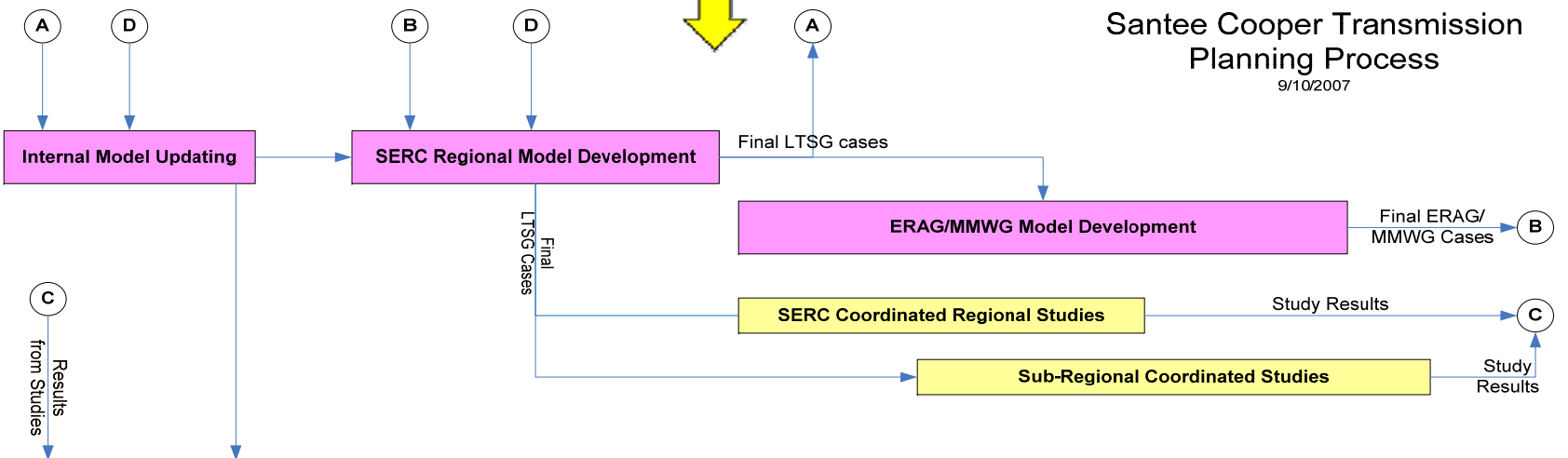
South Carolina Regional Transmission Planning

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Santee Cooper Transmission Planning Process

9/10/2007





Economic Transmission Planning Scenarios

Clay Young

Economic Transmission Planning Principle

The purpose of Order 890's Economic Transmission Planning Principle is to:

- ensure that customers may request studies that evaluate potential upgrades or other investments that could reduce congestion or integrate new resources and loads on an aggregated or regional basis (e.g., wind developers)
- allow customers, not the transmission provider, to identify those portions of the transmission system where they have encountered transmission problems due to congestion or whether they believe upgrades and other investments may be necessary to reduce congestion and to integrate new resources

Economic Transmission Planning Principle

(continued)

- allow customers to request that the transmission provider study enhancements that could reduce such congestion or integrate new resources on an aggregated or regional basis without having to submit a specific request for service

This approach ensures that the economic studies required under this principle are focused on customer needs and concerns

Economic Transmission Planning Scenario Selection

- All requested sensitivities will be considered except sensitivities that specify specific generation resources
- Up to 5 sensitivities will be identified for study. If more than 5 are requested, Stakeholder voting members will vote to select the top five
- Sensitivities that are not selected by the voting process as one of the 5 studied sensitivities will be studied only if the requestor(s) pays for the additional study efforts

Economic Transmission Planning Scenario Selection

- Economic power transfer sensitivities with sources or sinks outside the SCRTP area will be advanced to the Southeast Inter-Regional Participation Process (SIRPP)



Economic Transmission Planning Scenario Selection

Economic Transmission Planning Study Submittal Form	
Date of Submission	
Name	
Title	
Company	
Address	
City, State, Zip	
Telephone	
Email	



Economic Transmission Planning Scenario Selection

Economic Scenario #1:	
Source Area:	
Sink Area:	
Transfer (MW):	
Start Date:	
End Date:	
Other Information:	
Benefits of Study and Other Comments:	



Model Development Update

Joseph Hood

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Model Development - Internal

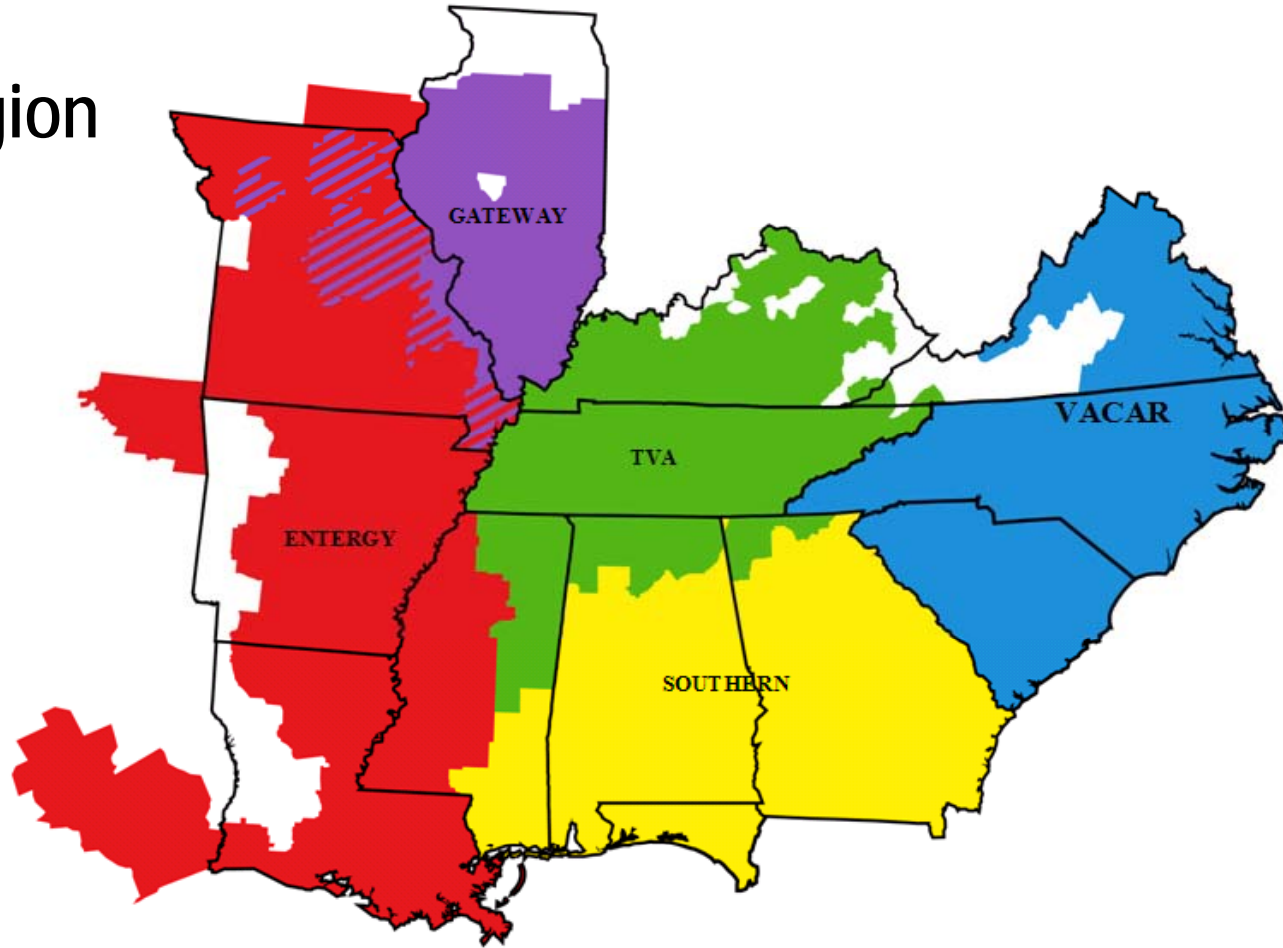
- Load Forecast
 - Summer/Winter Peak, Off-Peak and Seasonal Load Levels
 - Wholesale Loads Modeled according to Forecasts Provided by Customers
- Existing Generation
 - Input from Generation Maintenance Schedule
- Generation Additions
 - Input from Generation Expansion Plan
- Transmission Additions
 - Input from Planners and Engineering
- Firm Transmission Service
 - Input from OASIS, Coordinated with Neighbors

Model Development - External

- SERC
 - SERC Databank Update
 - SCE&G
 - Duke Power
 - Progress Energy – Car.
 - Santee Cooper
 - Virginia Power
 - Ameren
 - Southern Company
 - GTC
 - MEAG
 - TVA
 - Entergy
 - Others . . .
 - Southeastern models for the next ten years



SERC Region



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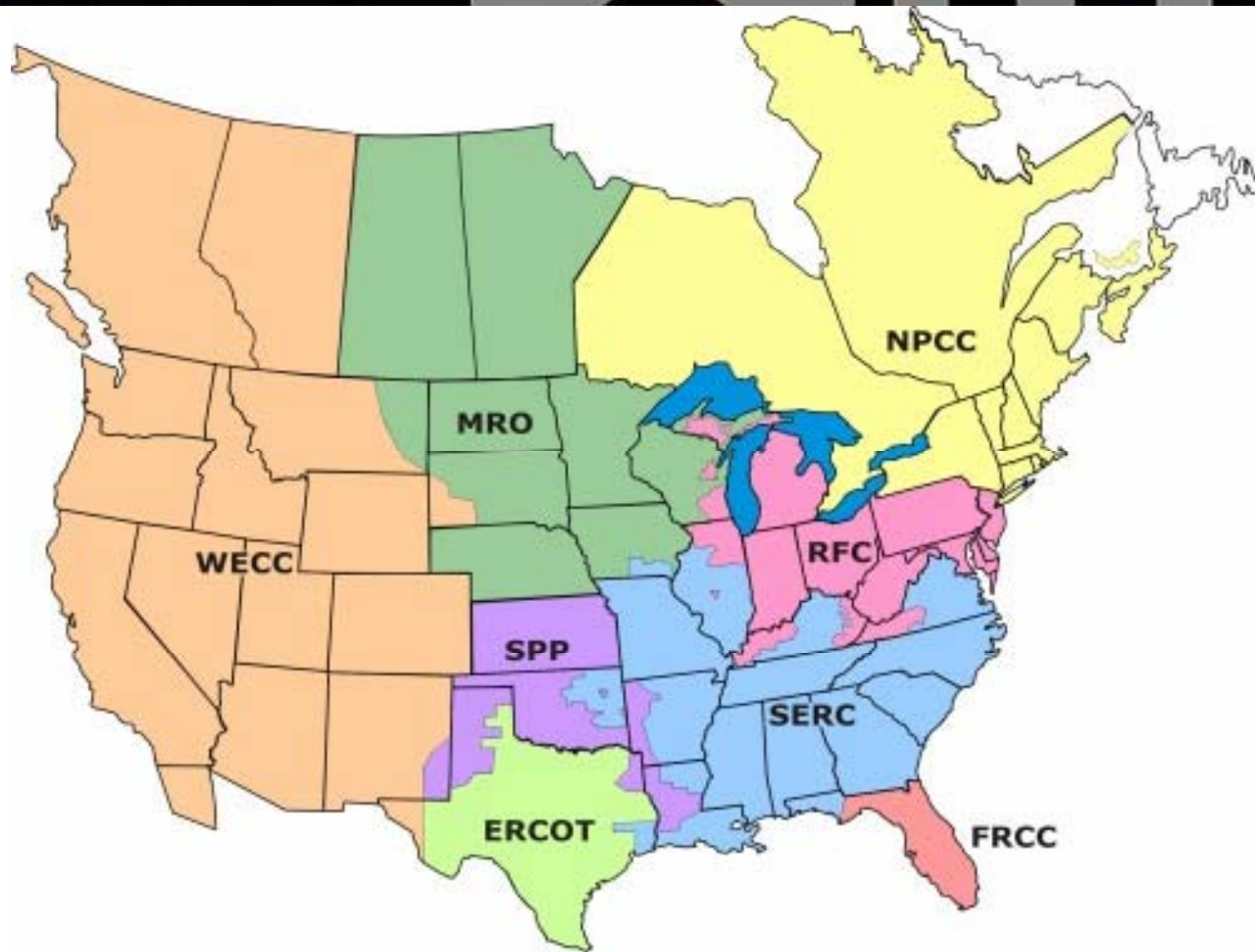
Model Development – External

- Eastern Interconnection
 - NERC
 - SERC and five other NERC Regions
 - Includes transmission systems from Florida to North Dakota and from Eastern New Mexico (parts of Texas) to Maine
 - Includes transmission systems in Canada from Nova Scotia to Saskatchewan
 - Develop Eastern Interconnection models for the next ten years
 - All participants receive a copy of the final models

These Eastern Interconnection models are the models used to plan the SCE&G and Santee Cooper Transmission Systems

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NERC





Reliability Studies

Stan Shealy

VACAR 2013 Summer/Winter Study

- The VACAR 2013 study was a 2 part study
- Part 1 was an assessment of the steady state thermal performance of the system with single contingencies (N-1) under NERC's TPL-002 standard
- Part 2 was an assessment of:
 - Double contingencies (N-2) under NERC's TPL-003 standard
 - Extreme contingencies (more than 2 facilities lost) under TPL-004

VACAR 2013 Summer/Winter Study

- Tested N-2 and Extreme-contingency events included:
 - Combinations of all single and common tower contingencies
 - One or two common tower contingencies are considered extreme scenarios

The following list provides a summary of the most significant facilities found to be heavily loaded in Part 1 of this study:

- Clark Hill 115/100 kV Transformer (Duke)
- Clark Hill-Thurmond 115 kV Tie Line (Duke/SEPA)
- Anderson-Hartwell 230 kV Tie Lines (Duke/SEPA)
- Jocassee 500/230 kV Transformer (Duke)
- Horseshoe-Pisgah 100 kV Lines (Duke)
- Parkwood 500/230 kV Transformers (Duke)
- Wateree 115/100 kV Transformer (CPLE/Duke)
- High Rock-Tuckertown-Badin 100 kV Lines (Yadkin)

Study Results

Part 1 (N-1 Contingencies)

No overloaded facilities in the SCE&G or SCPSA systems

Part 2 (N-2 and Extreme Contingencies)

SCE&G overloaded facilities:

V.C. Summer-Parr 230 kV loaded to 104.8%

St. George-Canadys 115 kV #2 line loaded to 102.8%

Killian-Pineland 115 kV loaded to 101.1%

Study Results

Part 2 (N-2 and Extreme Contingencies)

Santee Cooper overloaded facilities:

Campfield-Georgetown Sw Sta #1 115kV line loaded to 149%.

Aiken1-Aiken3 #2 115 kV line loaded to 131%

Aiken 1-Batesburg #1 115 kV line loaded to 126%

Aiken3-Shamrock #1 115 kV line loaded to 125%

(Continued)

Study Results

Part 2 (N-2 and Extreme Contingencies)

Santee Cooper overloaded facilities:

Georgetown Sw. Sta.-Winyah #2 or #1 loaded to 120%

Campfield-Georgetown Sw. Sta. 2 115 kV loaded to 117%

Bluffton-Varnville 115 kV line loaded to 116 %

Aiken3 #1 230/115 kV transformer loaded to 115%.

Vanville#1 230/115 kV transformer loaded to 113%

Greenwood County-Newberry 230 kV line loaded to 112%

Study Results

- SCE&G and Santee Cooper will develop solutions to these overload conditions
- Solutions will be presented at a future SCRTP meeting

VACAR – Southern Interface Study

- Georgia Transmission Company has completed the power flow analysis
- Results are being reviewed
- Results will be presented at a future SCRTP meeting



SERC Seasonal Operating Assessments

Jim Peterson

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Participating Companies (SERC NTSG)

Progress Energy-Carolinas
Duke Energy Carolinas
Santee Cooper
South Carolina Electric & Gas
Dominion Virginia Power
APGI-Yadkin
Southeastern Power Administration
Southern Company Services
Georgia Transmission Company
Municipal Electric Authority of Georgia
Southwest Power Pool

Tennessee Valley Authority
Big Rivers Electric Cooperative
East Kentucky Power Cooperative
E. ON U.S. Services
Entergy
Associated Electric Cooperative, Inc.
Ameren
Columbia, MO Water & Light Department
City Water, Light & Power, Springfield, IL
Southern Illinois Power Cooperative
Electric Energy Incorporated
PJM



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Purpose of Study

- Reliability Analysis for selected transfers occurring non-simultaneously among SERC members and through the SERC sub-regions
- Identify Limiting facilities for non-simultaneous transfers among SERC members and SERC sub-regions
- Appraisals for the SERC study areas
- Validate proper planning of SERC member transmission systems
- The FCITCs reported in this study are based on simulated system operation
- FCITCs reported are not used in OASIS postings.



FCITC values are based on the prediction of many factors that could change in daily operation of the power system.

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Variable Factors

- load forecasts and generation availability
- anticipated drought conditions in the SERC area
- geographic distribution of load and generation
- transmission system configuration
- simultaneous inter-system power transfers
- operation based on regional requirements to respect additional contingencies
- control settings of Phase Angle Regulators (PARs)

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Significant Facilities

- Facility is a limit below the test level and transfer factors are above the cutoff
- The response of the facility to the transfer
- The number of different transfers/companies impacted
- If the facility requires the use of an operating guide
- If the outage of the facility results in overloads of several transmission elements
- If actual TLRs have been called on the facility

2008 NTSG Summer Reliability Study

2008 Summer Reliability Study of Projected
Operating Conditions

May 2008

Conclusions

2008 NTSG Summer Reliability Study

- Two transmission facilities in South Carolina Electric & Gas was identified as a limit to transfers studied.
 - Yemassee to Ritter 115 kV Line
 - local area problem and is influenced by generation dispatch
 - SCE&G is reviewing several projects in the area that will reduce flows on this facility
 - McIntosh to Jasper 115 kV Line
 - Sensitive to outage of McIntosh to Purrysburg 230 kV Line

Conclusions

2008 NTSG Summer Reliability Study

- One transmission facility in Santee Cooper was identified as a limit to transfers studied
 - McIntosh to Purrysburg 230 kV Line
 - Limits caused by this facility are not severe to warrant a reliability concern

Conclusions

2008 NTSG Summer Reliability Study

- No additional transmission facilities in South Carolina Electric & Gas or Santee Cooper identified as limits to sub-regional transfers



**SERC EAST - RFC
2008 Summer
Interregional Transmission System Reliability
Assessment**

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Purpose of Study

- Reliability Analysis for selected transfers occurring **simultaneously** among, or through the SER regions
- Identify Limiting facilities for non-simultaneous emergency transfers among MISO, SERC East, and expanded PJM
- Appraisals for the PJM, MISO and SERC East study areas
- The FCITCs reported in this study are based on simulated system operation

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Introduction

FCITC values are based on the prediction of many factors that could change in daily operation of the power system

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Variable Factors

- load forecasts and generation availability
- anticipated drought conditions in the SERC area
- geographic distribution of load and generation
- transmission system configuration
- simultaneous inter-system power transfers
- operation based on regional requirements to respect additional contingencies
- control settings of Phase Angle Regulators (PARs)

Conclusions

- No facilities in South Carolina Electric & Gas or Santee Cooper's systems were identified as limitations in the 2008 SERC East - RFC Interregional Reliability Assessment



New Transmission Investment in the Southeast

Jim Peterson

New Transmission Investment in the Southeast

- SERC Reliability Corporation requests transmission investment information via yearly Transmission Development Survey
 - Transmission Providers
 - Actual Expenditures for the Previous Year
 - Anticipated Transmission Investment for next 5 year period.
- Investment information included in SERC RRS Review to SERC Engineering Committee.

New Transmission Investment in the Southeast

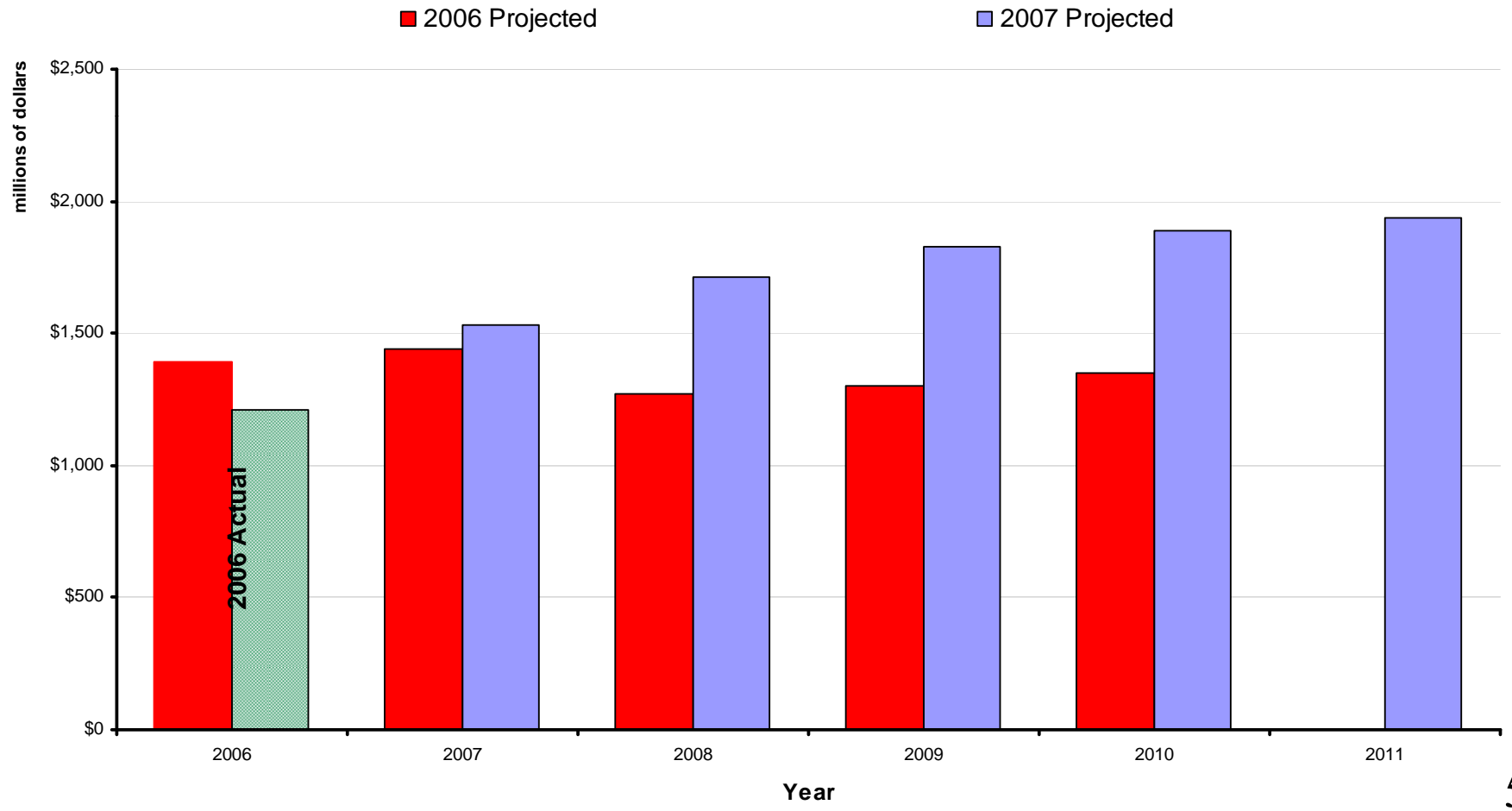
- Information Requested
 - Total Planned Transmission Expenditures
 - 5 years of cost data
 - 100 kV and above
 - Transmission Projects Only
 - New lines and substations
 - Line and substation rebuilds
 - Line reconductoring projects

New Transmission Investment in the Southeast

- Information Requested (cont'd)
 - Sub-categories of Expenditures
 - Directly attributed to generator interconnections
 - Consisting of optional upgrades associated with both generator interconnections and transmission service for generators

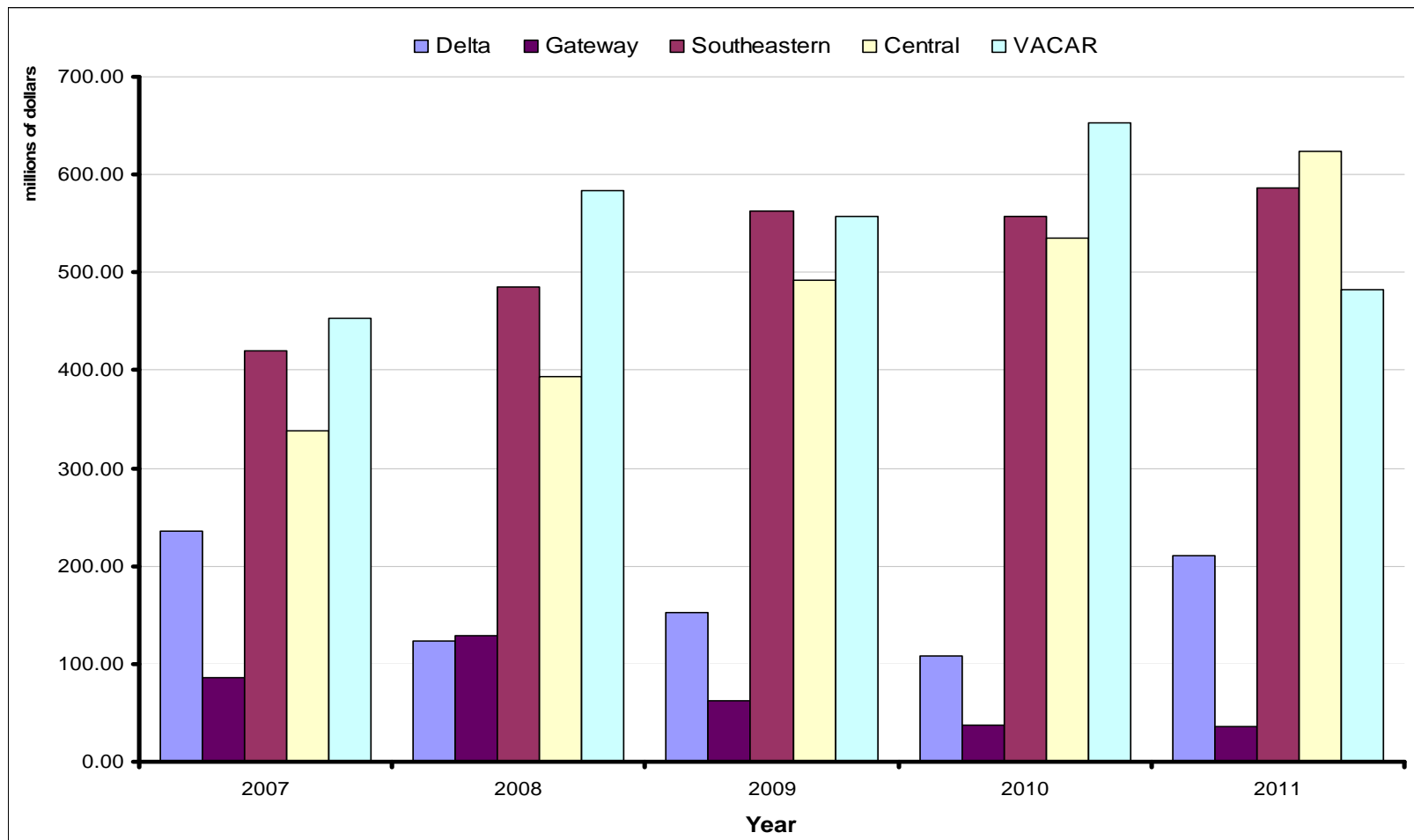


New Transmission Investment in the Southeast





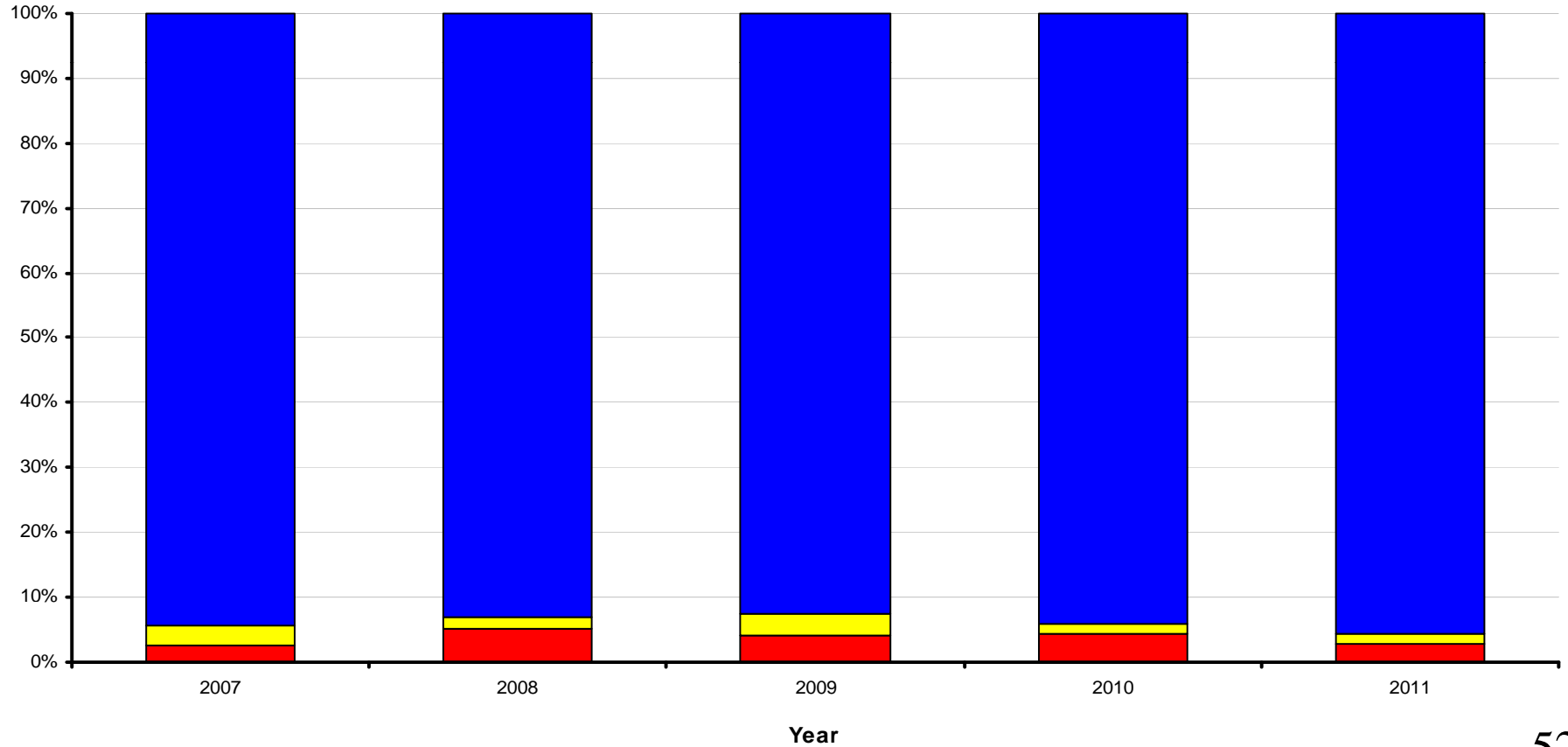
New Investment by SERC Subregion





Contribution of Generators & Optional Upgrades

■ 2007 Generator Related ■ 2007 Optional Upgrades ■ 2007 Other

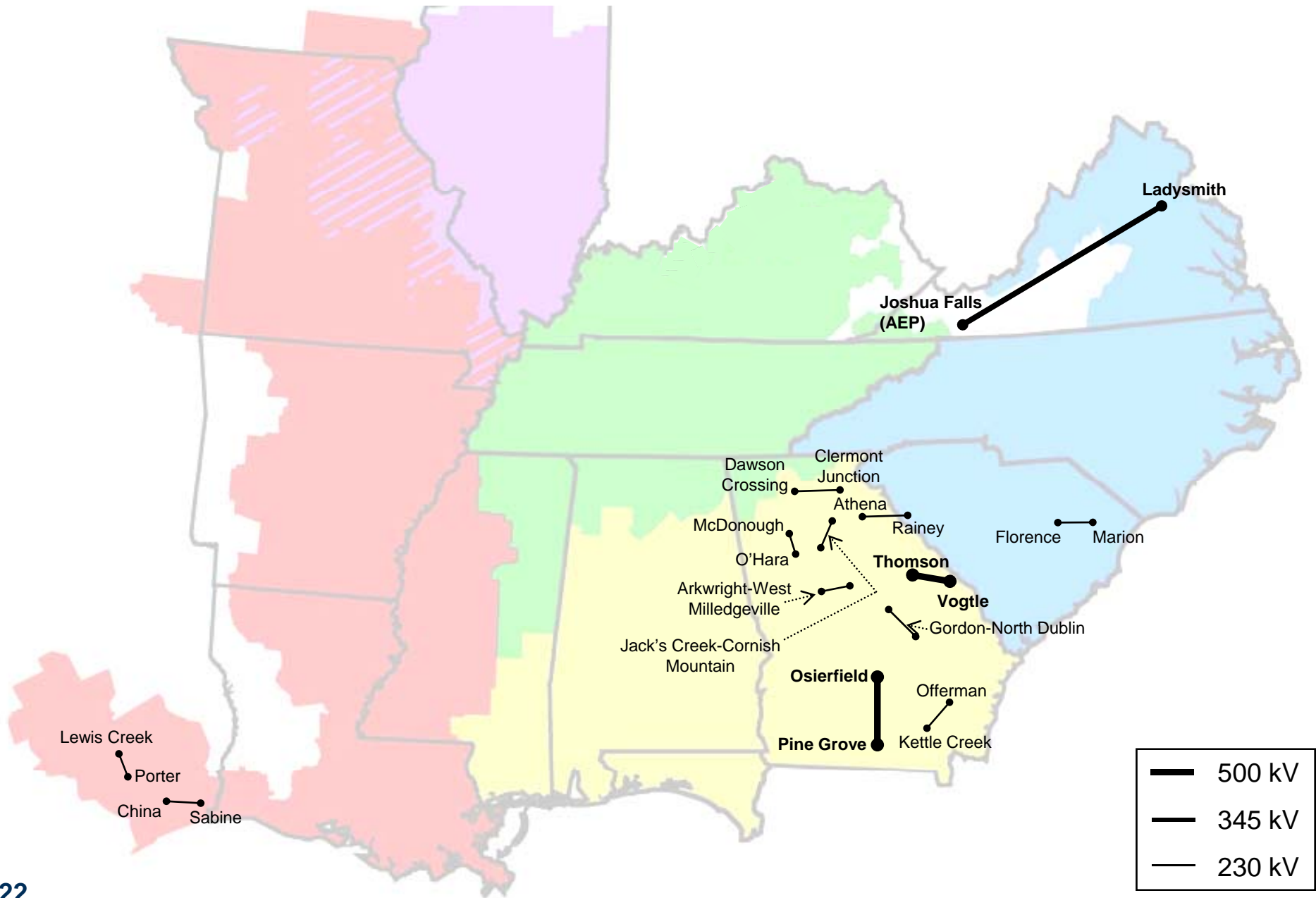


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New Transmission Investment in the Southeast

- Actual spending in 2006 lower than projected spending acquired from last year's survey (\$1.209 vs. \$1.394 Billion)
- The total spending projected by the 2007 survey (\$8.90 Billion) shows a significant increase vs. the 2006 survey (\$6.76 Billion)
- The percentage of total spending attributed to generation interconnections and optional upgrades is about 6%, up slightly from 5% in the 2006 survey.

2012 – 2017 SERC Transmission Additions 230 kV & Above - Longer than 20 miles





New Transmission Investment in the Southeast

Questions ?

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SCRTP Website

Clay Young

SCRTP Non-Discloser Agreement

- SCE&G and Santee Cooper are developing a single Non-Disclosure Agreement (NDA)
- Currently in draft form
- NDA will be forwarded to all registered Stakeholders when complete
- Executed NDA will allow access to Secure side of SCRTP Website
 - Reports and Data Bases



Southeast Inter-Regional Participation Process (SIRPP)

Clay Young

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Overview of Process

- Provides expanded Economic Planning studies
- Provides transmission information to market participants
- Extends the Regional Participation principle to an Inter-Regional level
- Additional coordination among transmission owners
- Annual cycle of Economic Planning studies

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Participating Transmission Owners

- Alabama Electric Cooperative
- Duke Energy Carolinas
- Dalton Utilities
- Entergy Operating Companies
- Georgia Transmission Corporation
- Municipal Electric Authority of Georgia
- Progress Energy Carolinas
- Santee Cooper
- South Carolina Electric & Gas
- South Mississippi Electric Power Assoc.
- Southern Companies
- Tennessee Valley Authority



Next Meeting of SIRPP

- July 10, 2008
- Charlotte, NC
- SIRPP Stakeholder Group will propose and select 5 inter-regional economic transfer scenarios for study
- Additional information and register for meeting at www.southeastirpp.com



Next Meeting Activities

Clay Young

Next SCRTP Meeting

- Date / location not set
- You will be notified by email
- Register online
- SCE&G and Santee Cooper will present the results of the Economic Transmission Planning studies



South Carolina Regional Transmission Planning

Stakeholder Meeting

Columbia Metropolitan Convention Center

Columbia, SC

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