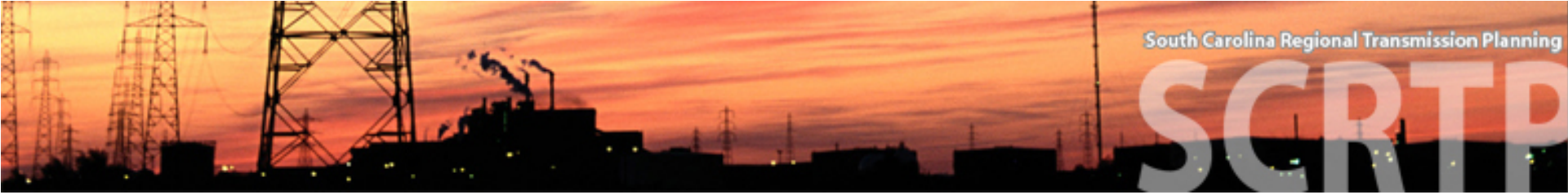

South Carolina Regional Transmission Planning

Stakeholder Meeting

SCE&G Lake Murray Training Center

Lexington, SC

January 15, 2013

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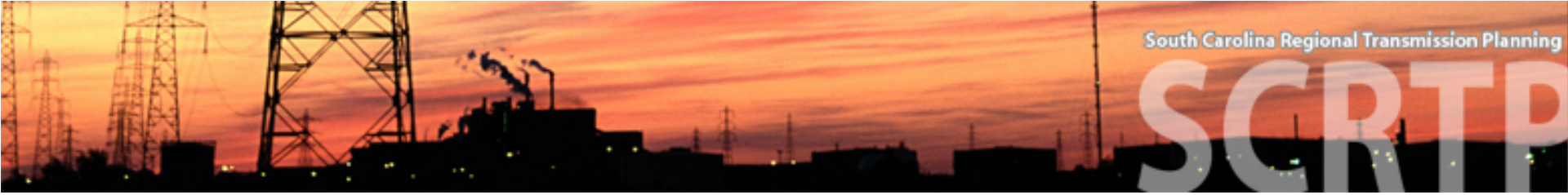

Purpose and Goals of Today's Meeting

- FERC Order 1000 Interregional Requirements
- Review Key Data and Assumptions for the next Planning Cycle
- Elect SCRTP Stakeholder Group Voting Members
- Identify Economic Power Transfer Sensitivities to be studied
- Review Status of Assessment and Planning Studies
  - CTCA Studies
  - ERAG Studies
  - SERC Studies

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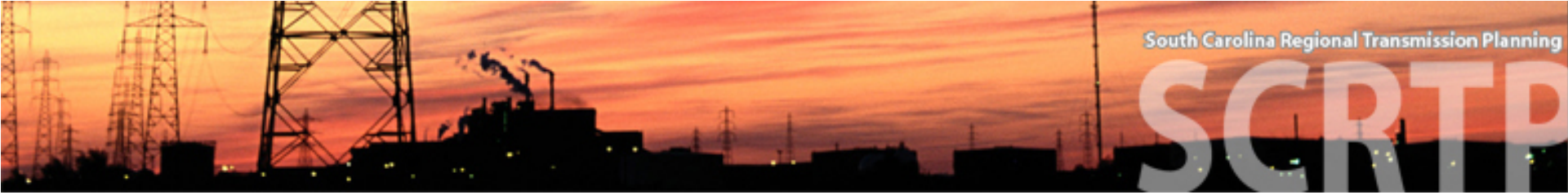

FERC Order 1000
Transmission Planning and Cost Allocation

Interregional Requirements

Clay Young

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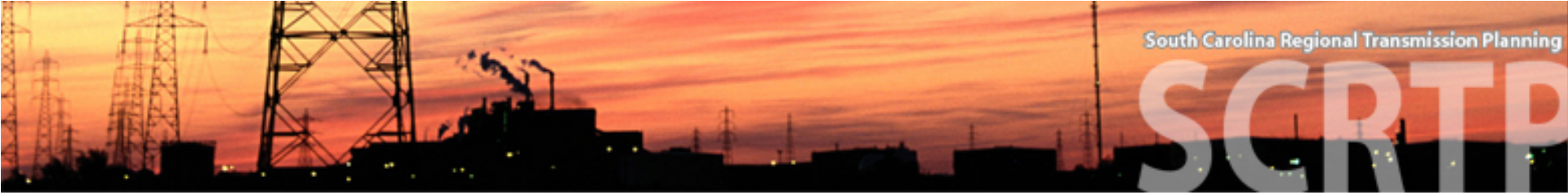

Order 1000 – Regional Requirements Update

- Effective Date of Order 1000 Final Rule – Oct 11, 2011
- Regional and Interregional Requirements
- SCE&G filed Regional compliance filing on October 11, 2012
- One protest filing (LS Power)
- SCE&G filed answers to LS Power's protest on January 10, 2013
- Effective Date of Regional requirements will be after FERC approval of the compliance filing

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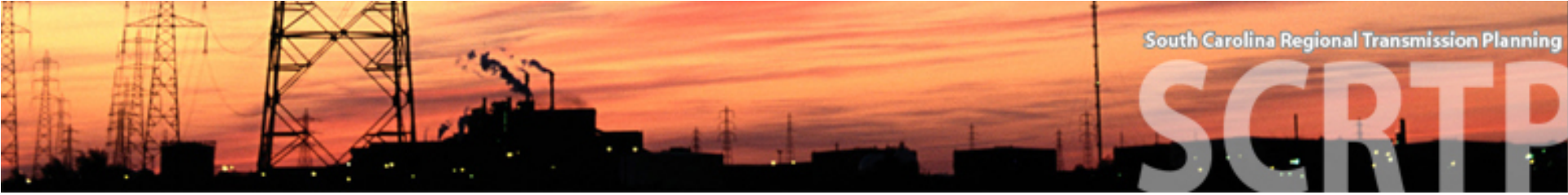

Order 1000 – Interregional Requirements

- Interregional compliance filing – April 11, 2013 (Order 1000 effective date + 18 mo.)
- Effective Date of Interregional requirements will be after FERC approval of the compliance filing

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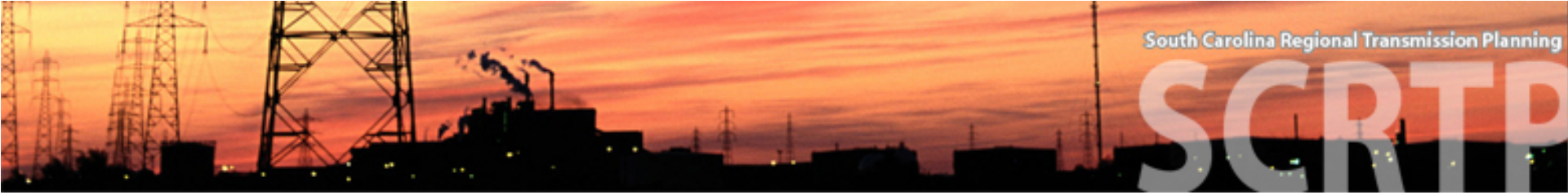
FERC Order 1000 – Interregional Requirements

Enhance Regional transmission planning process

- Establish coordination procedures with neighboring Regions
  - North Carolina Transmission Planning Collaborative (NCTPC)
  - Southeastern Regional Transmission Planning (SERTP)
- Share transmission needs and potential solutions
- Annual exchange of planning data and information



FERC Order 1000 – Interregional Requirements

Enhance Regional transmission planning process

- Identify and jointly evaluate proposed projects to be located in adjacent planning regions that may be more efficient or cost-effective than separate regional plans (compliance filing must include a description of this process for each neighboring region)
- Maintain Regional website or email distribution list for interregional communication

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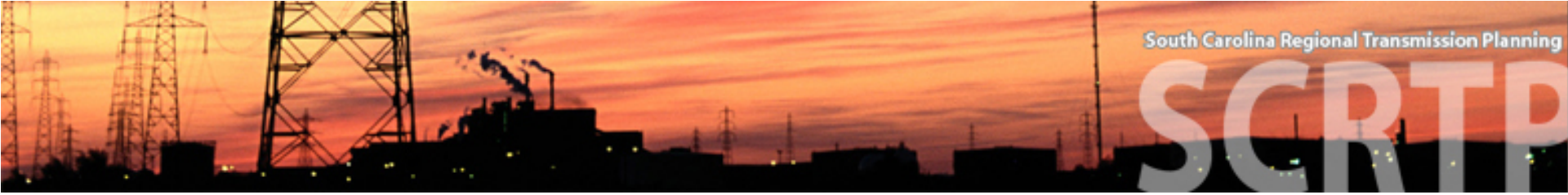

FERC Order 1000 – Interregional Requirements

- Interregional transmission coordination should complement local and regional transmission planning processes, and should not substitute for these processes
- An interregional transmission facility must be selected in both of the relevant regional transmission plans for purposes of cost allocation in order to be eligible for interregional cost allocation

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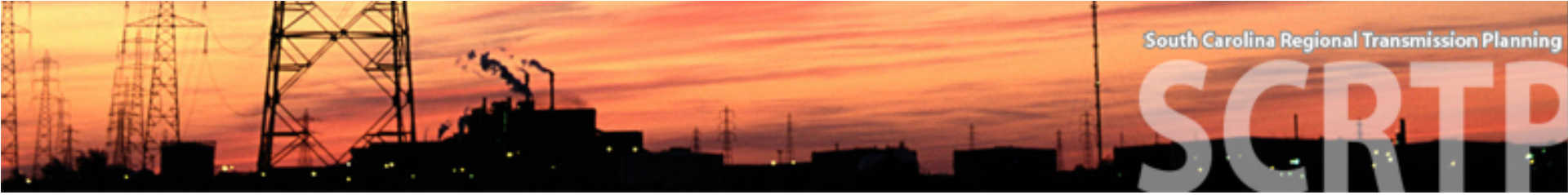

FERC Order 1000 – Interregional Requirements

Interregional Cost Allocation

- Transmission providers in each pair of neighboring regions to develop a mutually agreeable cost allocation methodology for a transmission facility located in both regions
- Interregional cost allocation method may be different from the respective regional methodologies
- Six cost allocation methodology principals

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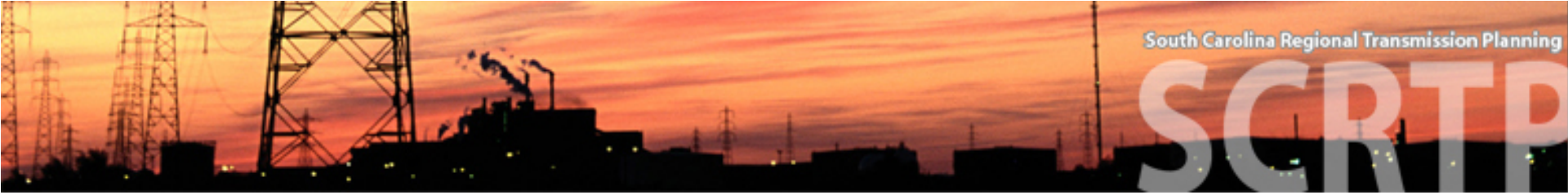

FERC Order 1000 – Interregional Requirements

Cost Allocation Principals:

1. Cost allocation to be "roughly commensurate" with estimated benefits
2. No costs allocated to those who receive no benefits
3. Benefit/Cost threshold, if used, may not exceed 1.25
4. Costs may be assigned only to regions where the facility is located

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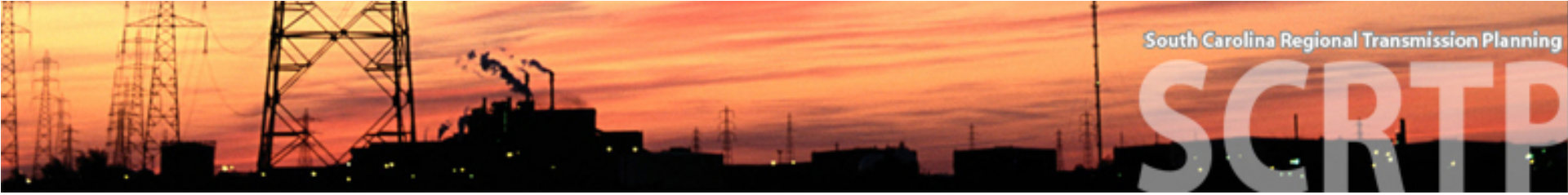

FERC Order 1000 – Interregional Requirements

Principals:

5. Transparent and documented process
6. Different allocation methodologies allowed for different types of facilities (i.e. – reliability, economic, public policy)

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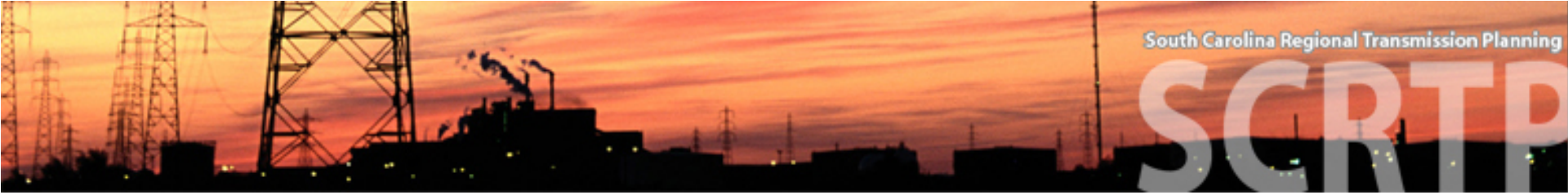
FERC Order 1000 – Interregional Requirements

Stakeholder Input, Comments and Questions



Key Data and Assumptions for the Next Planning Cycle

SCE&G

Phil Kleckley

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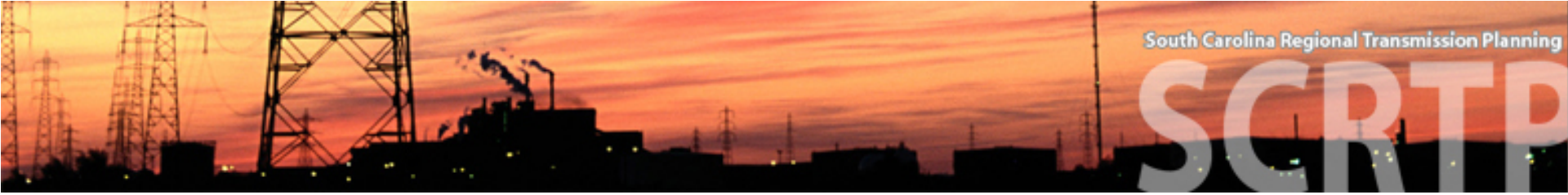
Modeling Assumptions and Data

Dispersed Substation Load Forecast

- Summer/Winter Peak, Off-Peak and Seasonal Load Levels
- Resource Planning provides 10 Year system load forecasts
- Transmission Planning creates dispersed substation load forecasts



Load Forecast Process

Resource Planning Input

- Develop 10 year projected forecast based on:
  - 10 year historical summer and winter loads
  - Load factors by customer class
  - Considers weather, personal income, population growth, economic conditions, load management, energy efficiency, etc
  - Applies regression analysis to historical data to develop models
  - Applies forecasted growth rates to develop future projections

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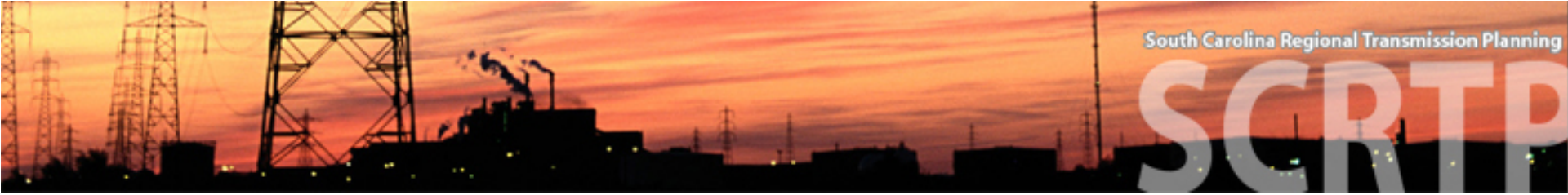

SCE&G 10 Year Load Forecast

	Summer		Winter
2013	5,016 MW	2012/2013	4,738 MW
2014	5,111 MW	2013/2014	4,781 MW
2015	5,160 MW	2014/2015	4,817 MW
2016	5,290 MW	2015/2016	4,884 MW
2017	5,335 MW	2016/2017	4,949 MW
2018	5,422 MW	2017/2018	5,023 MW
2019	5,512 MW	2018/2019	5,086 MW
2020	5,591 MW	2019/2020	5,143 MW
2021	5,657 MW	2020/2021	5,211 MW
2022	5,735 MW	2021/2022	5,285 MW

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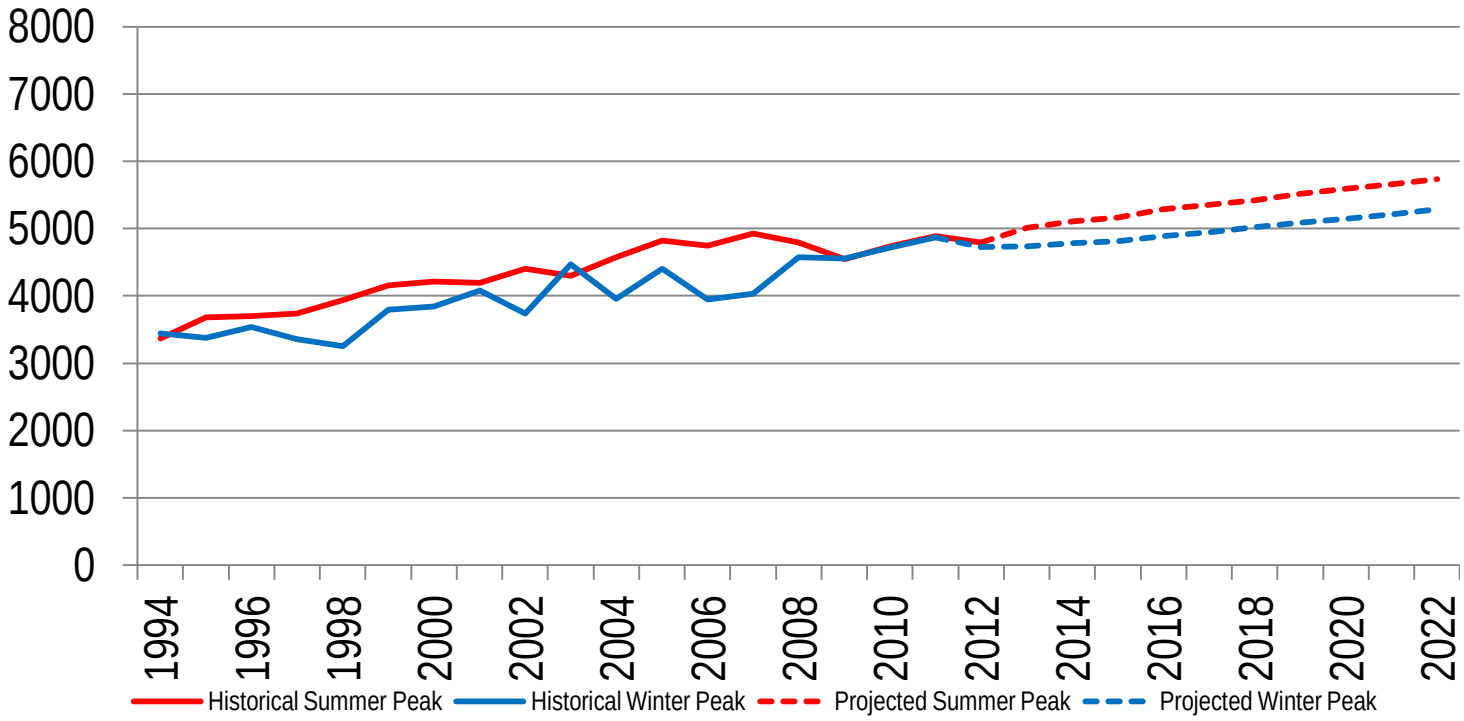
Load Forecast Process

Resource Planning Input



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Load Forecast Process

Transmission Planning Input

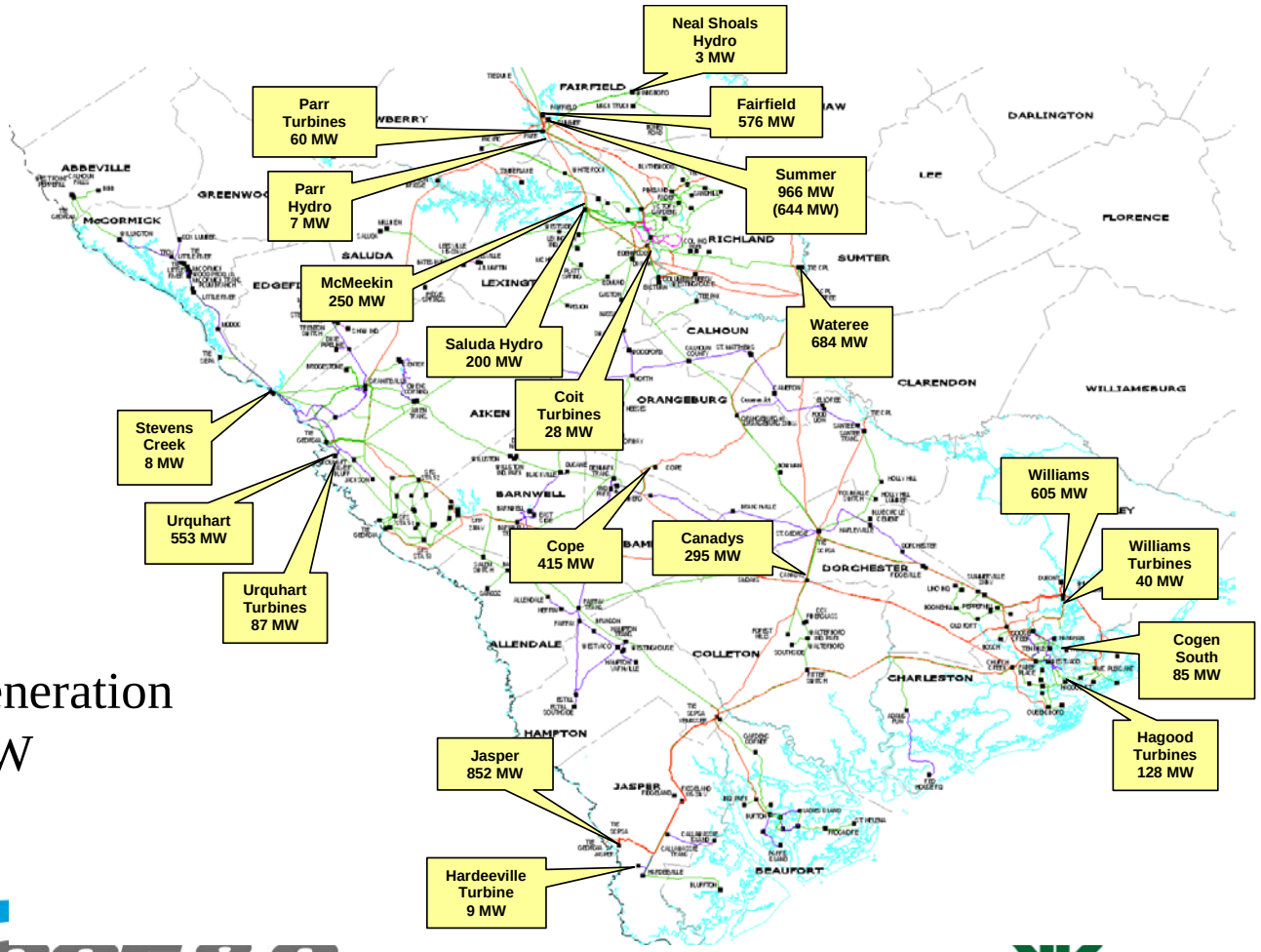
- Obtain summer and winter snapshot meter data from most recent seasons and adjust for load switching
- Develop 10 year projected forecast based on:
  - 10 year historical loading
  - Feedback from Distribution Planning, Local Managers, Large Industrial Group and Transmission Services Manager
- Wholesale loads are modeled as provided by the customer
- Dispersed forecasted load points are integrated into Corporate forecasted load

Modeling Assumptions and Data

Generation

- Annual generator ratings used
- Input from Generation Expansion Plan – Reductions/Additions
- Input from Generation Maintenance Schedule
- Generators dispatched economically
- Merchant Generators included

Existing Generation



Rated Generation
5,529 MW

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Generation Plan

Reductions

- 90 MW Coal 2013
- 245 MW Coal 2017
- 345 MW Coal 2018

Generation Plan

Additions

- 1117 MW of SCE&G/Santee Cooper Base Load Nuclear Generation planned for 2017 (V. C. Summer)

- 1117 MW of SCE&G/Santee Cooper Base Load Nuclear Generation planned for 2018 (V. C. Summer)

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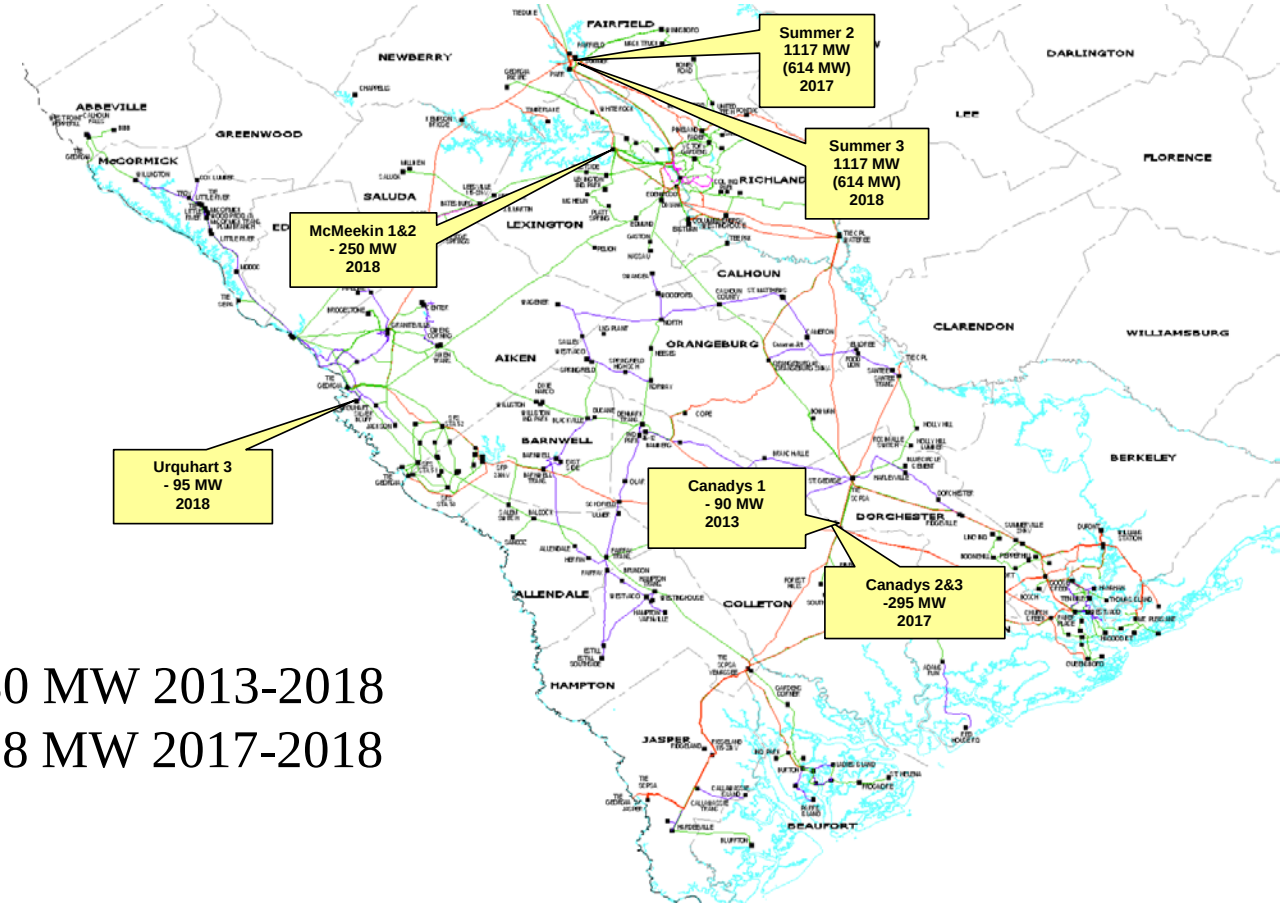
Generation Changes



- 730 MW 2013-2018
+ 1228 MW 2017-2018

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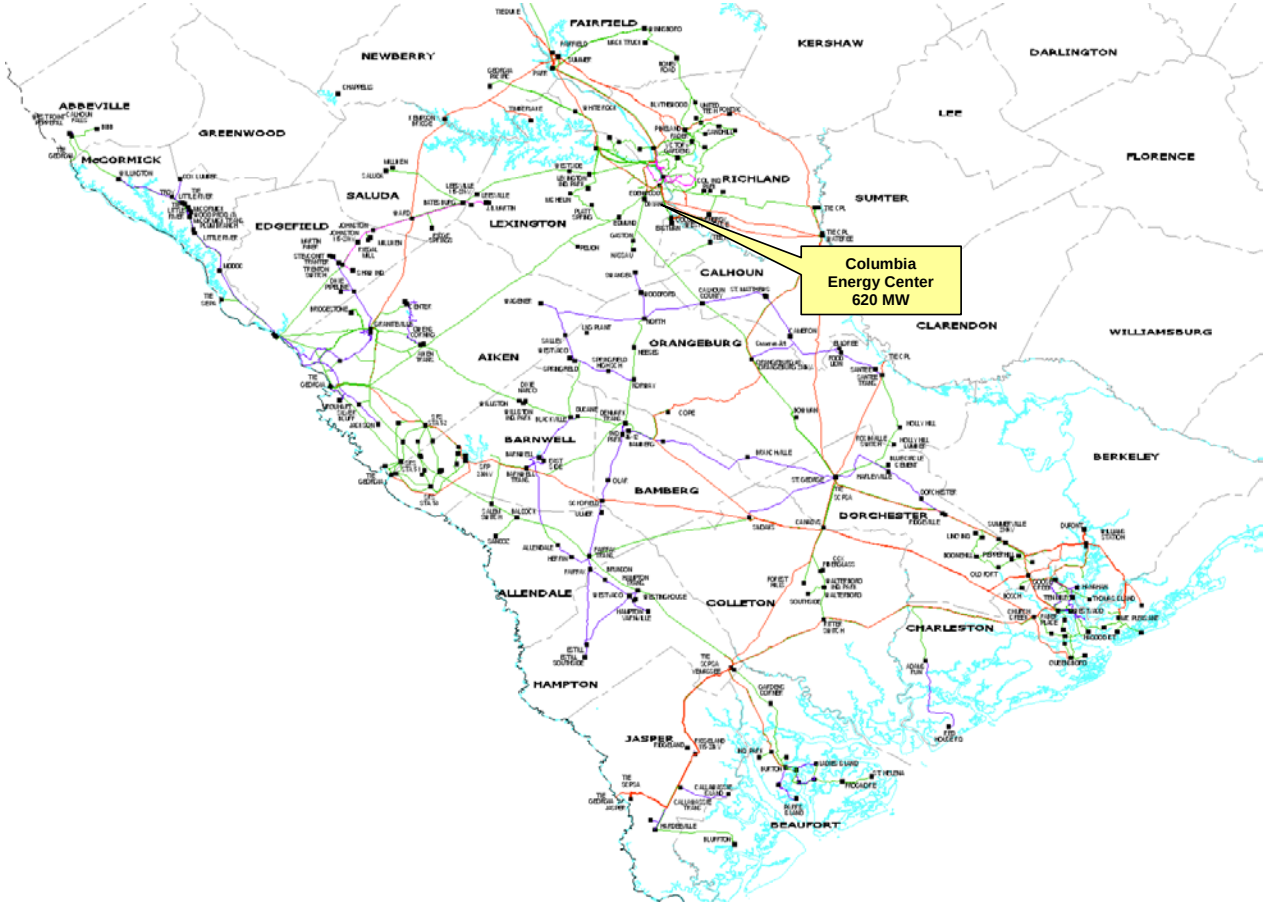
Merchant Generation



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Modeling Assumptions and Data

Transmission Network

- Input from Transmission Plan
- Neighboring Transmission Systems Modeled

Modeling Assumptions and Data

Planned Transmission Facilities

South Carolina Electric & Gas Planned Transmission Facilities	
Planned Project	**Tentative Completion Date**
Bridgestone #2 115kV Fold In Construct	Dec-12
Nexans Tap – Nexans 115kV Line Construct	Jan-13
Stevens Ck – Rabon Pt 115kV Line Section Upgrade to Double Circuit	May-13
VCS2 230kV Switchyard Construct	May-13
Charlotte St – Hagood 115kV Line Construct	May-13
Retire Accabee 115kV Substation and Bypass 115kV Lines	May-13
Lake Murray Add 2nd 230/115kV Autotransformer	May-13
Blythewood – Killian 230/115kV Double Circuit Construct	Dec-13
Hamlin-Isle of Palms 11kV Underground Cable Construct	Dec-13
Cainhoy 230/115kV Substation Construct	May-14
AM Williams – Cainhoy 115kV #1 Line Convert to 230kV	May-14
Aiken #3 – Aiken Hampton 115kV Line Section Upgrade	May-14

Modeling Assumptions and Data

System Interchange

- Firm scheduled transfers included
- Coordinated with Neighbors

Key Data and Assumptions for the Next Planning Cycle

Santee Cooper

William Gaither

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Components

- Demand Forecast
- Transmission Network
- Generation Resources
- Actual System Operations

Demand Forecast

Load forecast is developed with contributions from:

- Santee Cooper (retail, industrial)
- Central Electric Power Cooperative, Inc. (retail, industrial)
- Cities of Bamberg and Georgetown (municipal)

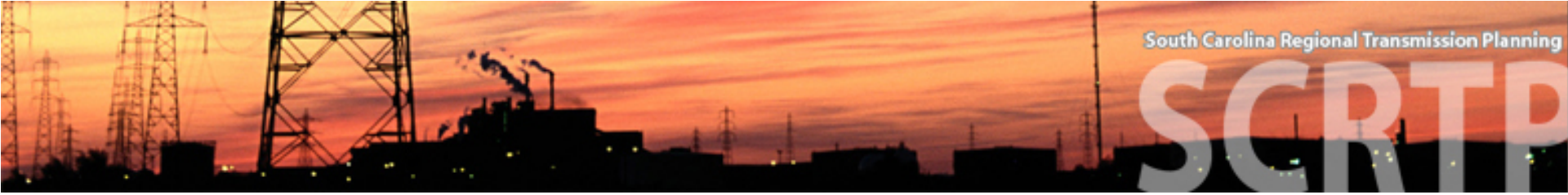
Transmission Network

Models include:

- Existing transmission system as well as committed Santee Cooper additions (uncommitted facilities are subject to change in scope or date).
- Confirmed firm PTP transmission service reservations
- Neighboring transmission system representations.
- All facilities assumed to be available for service.
- Normal operating status (in-service or OOS) of facilities is represented.

Transmission Network

- Uniform rating methodology is applied to transmission facilities.
- Base case models are updated annually.
- Study models may be updated prior to any study effort.



Generation Resources

Existing Connected Generation

Cross 1- 4

Grainger 1, 2

Hilton Head Turbines 1- 3

Jefferies 1, 2, 3, 4, 6 (Hydro)

Jefferies 1, 2, 3, 4 (Steam)

Myrtle Beach Turbines 1-5

Winyah 1-4

J.S. Rainey Power Block 1

J.S. Rainey 2A, 2B

J.S. Rainey 3-5

Spillway (Hydro)

St. Stephen 1-3 (Hydro)

V.C. Summer #1

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Generation Resources

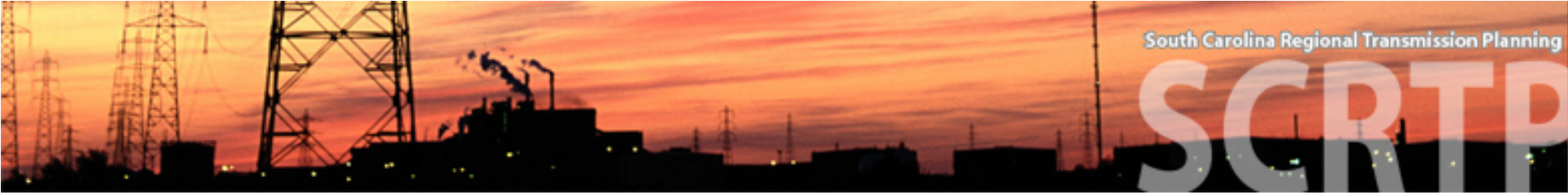
Projected Capacity in Models

V. C. Summer #2 (03/2017)

V. C. Summer #3 (05/2018)

Key Planning Data and Assumptions

Stakeholder Input, Comments and Questions



SCRTP Stakeholder Group
Voting Member Elections

Tom Abrams

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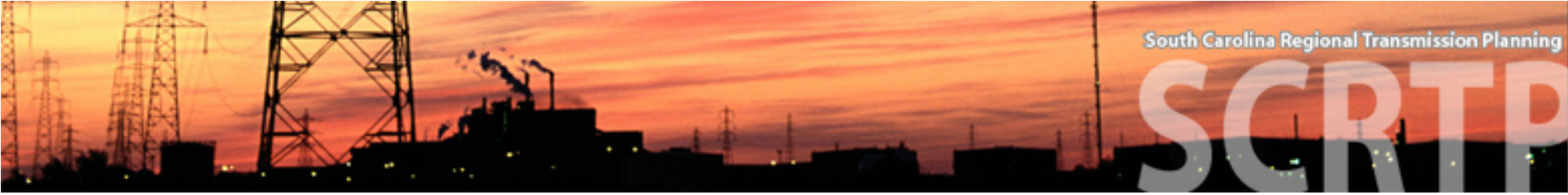
Stakeholder Group Sectors

- Transmission Owners/Operators
- Transmission Service Customers
  - PTP and Network
- Cooperatives
- Municipals
- Marketers
- Generation Owners/Developers
- ISO/RTO
- State Regulatory Representatives



Key Features of Stakeholder Group

- Stakeholder participants determine sector affiliation
- Each sector will have two voting members
- One vote per member
- Majority Rule
- Voting members determined by sector members annually at the Fall meeting
- Each company will have one voting member in the stakeholder group
- Stakeholder meetings are open to non-stakeholder members
- Stakeholder group will identify and request economic transfers to be studied (if more than five requested, stakeholders will vote to select the top five)
- Stakeholder group can change the number and timing of meetings with agreement by SCPSA and SCE&G

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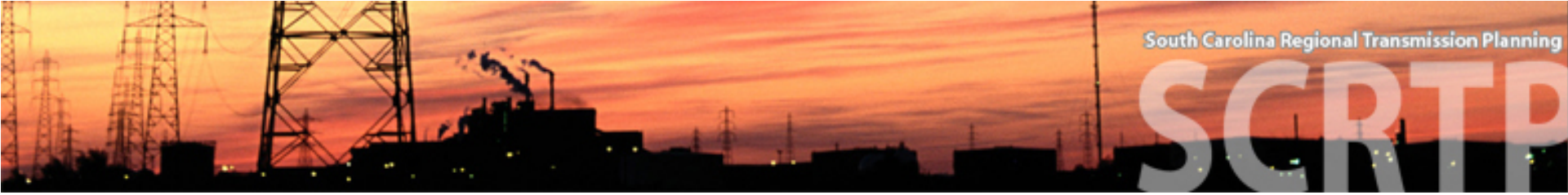
2012 Voting Stakeholder Group Members

- Cooperatives
  - John Boyt, Central Electric
  - Bob Beadle, NCEMC
- Municipals
  - John Bagwell, Orangeburg DPU
  - Alan Loveless, City of Georgetown
- Network and PTP Transmission Customers
  - J. W. Smith, Southeastern Power Administration
  - Vacant



2012 Voting Stakeholder Group Members

- Generation Owners / Developers
  - Victor Shaw, Calpine, Columbia Energy Center
  - Vacant
- Marketers
  - Eddie Folsom, SCE&G Power Marketing
  - Glenda Horne, Santee Cooper Power Marketing
- Transmission Owners
  - Bob Pierce, Duke Energy-Carolinas
  - Southern Company Transmission

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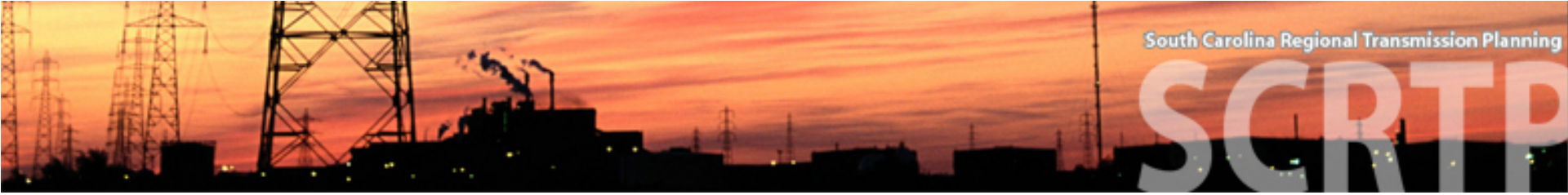
2012 Voting Stakeholder Group Members

- ISO / RTO
  - Vacant
  - Vacant



Annual Election of SCRTP Stakeholder Group

Stakeholder Breakout Sessions to Select Voting Representatives

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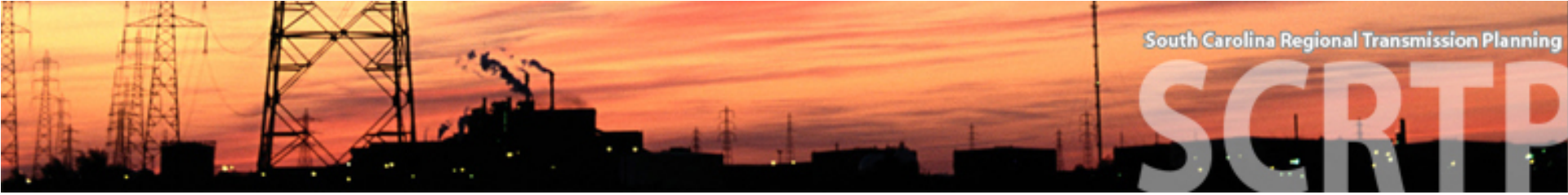

Economic Transmission Planning Scenarios

Tom Abrams

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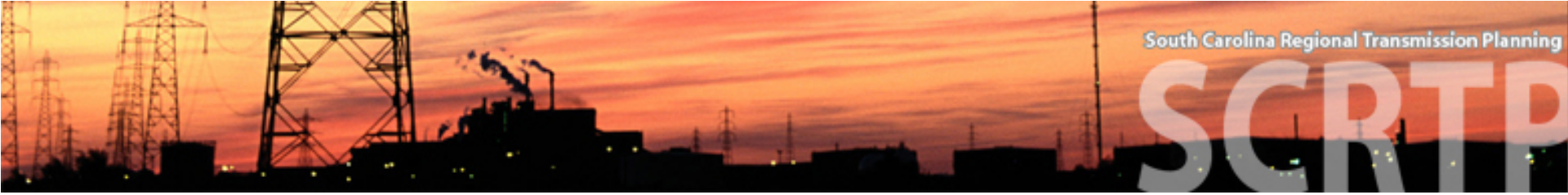

Economic Transmission Planning Principle

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
- 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

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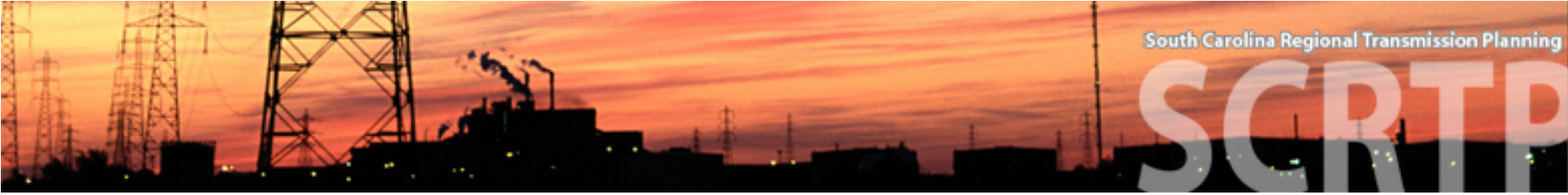
Economic Transmission Planning Principle

(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

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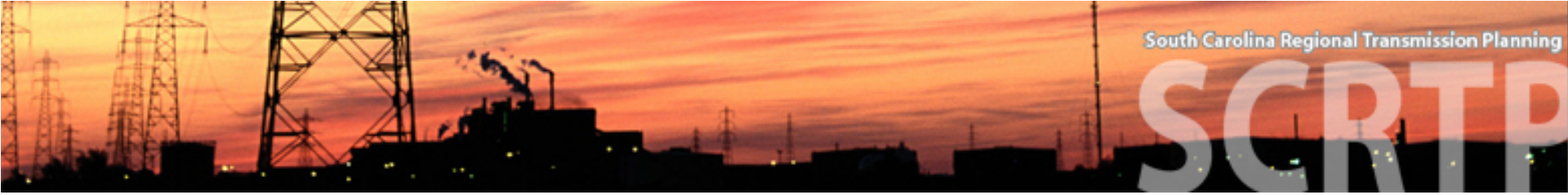

Economic Transmission Planning Scenario Selection

- Economic power transfer sensitivities with sources or sinks outside the SCRTP area will be advanced to the Southeast Inter-Regional Participation Process (SIRPP) unless stakeholders agree that only SCRTP area impacts are requested

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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

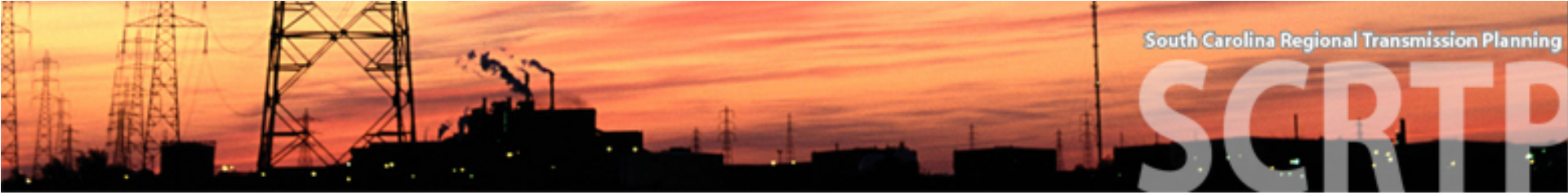
Economic Scenario #1:	
Source Area:	Southern
Sink Area:	Santee Cooper
Transfer (MW):	500 MW
Study Year:	2014
Study Conditions:	Summer Peak
Other Information:	
Benefits of Study and Other Comments:	

Economic Transmission Planning Scenario Selection

Economic Scenario #2	
Source Area:	Southern
Sink Area:	Santee Cooper
Transfer (MW):	500 MW
Study Year:	2014
Study Conditions:	Winter Peak
Other Information:	
Benefits of Study and Other Comments:	

2013 Economic Planning Scenarios

Source	Sink	Amount (MW)	Year	Study Conditions
Southern	SCPSA	500	2014	Summer Peak
Southern	SCPSA	500	2014	Winter Peak



Transmission Planning Base Cases
2012 MMWG Series

2014 Spring	SERC-ERAG-MMWG
2014 Summer	SERC-ERAG-MMWG
2014/15 Winter	SERC-ERAG-MMWG
2018 Spring Light Load	SERC-ERAG-MMWG
2018 Summer	SERC-ERAG-MMWG
2018/19 Winter	SERC-ERAG-MMWG
2023 Summer	SERC-ERAG-MMWG

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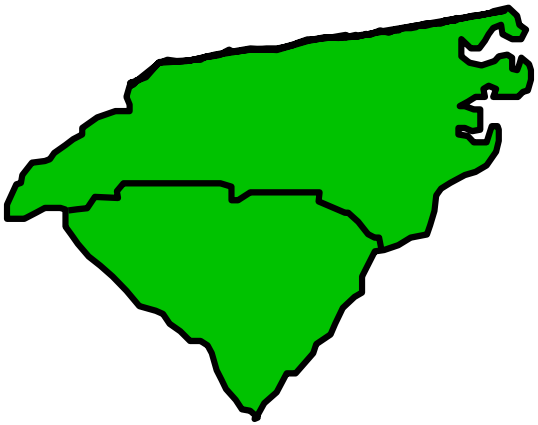
Reliability Assessment Studies

Jim Peterson and
Kale Ford

Multi-Party Assessments

- Carolina Transmission Coordination Arrangement (CTCA) Assessments
- SERC Assessments
- ERAG Assessments
- Two Party or Multi-Party Assessments

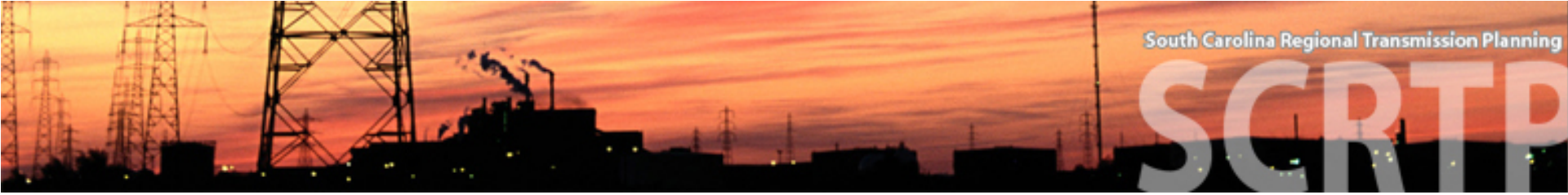
CTCA Future Year Assessments



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



CTCA Purpose

Interchange Agreements associated with the CTCA

Duke Energy Corporation ("Duke") and Progress Energy Carolinas ("PEC")

Duke Energy Corporation ("Duke") and South Carolina Electric & Gas Company ("SCE&G")

Duke Energy Corporation ("Duke") and South Carolina Public Service Authority ("SCPSA")

Progress Energy Carolinas ("PEC") and South Carolina Electric & Gas Company ("SCE&G")

Progress Energy Carolinas ("PEC") and South Carolina Public Service Authority ("SCPSA")

South Carolina Electric & Gas Company ("SCE&G") and South Carolina Public Service Authority ("SCPSA")

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CTCA Power Flow Study Group

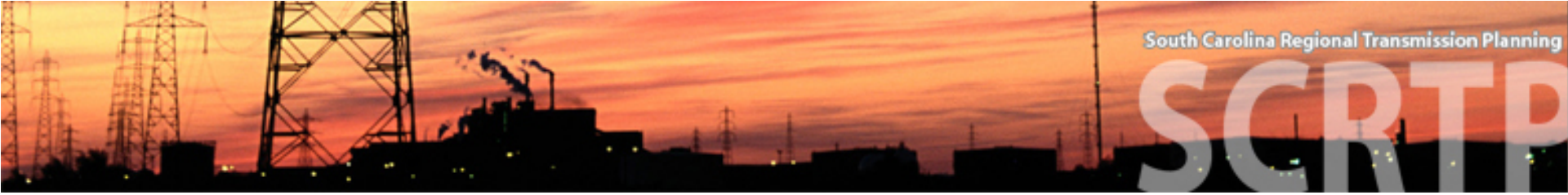
- Duke Energy Carolinas ("Duke")
- Progress Energy Carolinas ("Progress")
- South Carolina Electric & Gas ("SCEG")
- South Carolina Public Service Authority ("SCPSA")

CTCA Studies
Purpose

- 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").

CTCA Studies
2012 Scope

- NERC Reliability Standards, SERC Requirements, and individual company study criteria.
- Cases are developed with detailed internal models with current transmission expansion plans from each participating company.
- Generation down cases are developed from starting point cases with internal generation redispatch and Transmission Reserve Margin (TRM) import(s) implemented.



CTCA Studies
2012 Scope (continued)

- Study results are obtained by use of PTI's MUST and Siemens PSS/E programs.
- Report on thermal loading(s) above 90% and voltage(s) violating individual company criteria.
- Study year will 2016 Summer peak (2016S) and 2016 Shoulder Peak (light Load) with Low Gas Price Dispatch (2016H) periods.

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CTCA Studies
2012 Schedule

- Planning Committee approved Scope document –June 2012.
- Base Case development and revisions- June-July 2012.
- Individual companies run thermal and voltage assessments—August and early September 2012
- Draft report completed by September 2012.
- Final Report Published October 8, 2012.

CTCA Studies
2012 Results

TABLE E
SOUTH CAROLINA ELECTRIC AND GAS
SUMMARY OF POTENTIAL RELIABILITY ISSUES
2016 SUMMER PEAK

Element	Contingency	Potential Issue	Potential Solution
Aiken 2 Tap-Urquhart 115 kV Line	Graniteville-Aiken 3 Tap 115 kV and Graniteville-Stiefeltown 115 kV Lines	Loading (92.5%)	19.33 miles 477 ACSR Reconductor [2023]

CTCA Studies
2012 Results

TABLE F
SOUTH CAROLINA ELECTRIC AND GAS
SUMMARY OF POTENTIAL RELIABILITY ISSUES
2016 SHOULDER (with Low Gas Price Dispatch)

Element	Contingency	Potential Issue	Potential Solution
None	-	-	-

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CTCA Studies
2012 Results

TABLE G
SOUTH CAROLINA PUBLIC SERVICE AUTHORITY
SUMMARY OF POTENTIAL RELIABILITY ISSUES
2016 SUMMER PEAK

Element	Contingency	Potential Issue	Potential Solution
Perry Road-Myrtle Beach 115 kV Line 1	Belews 1 Gm Perry Road-Myrtle Beach 115 kV Line 2	Loading (97.1%)	5.40 miles 556 ACSR Reconductor [2018]
Georgetown-Campfield 115 kV Line	Belews 1 Gm Winyah-Campfield 230 kV Line	Loading (90.3%)	Existing Operating Procedure Open Winyah 230/115 kV Transformer

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CTCA Studies
2012 Results

TABLE H
SOUTH CAROLINA PUBLIC SERVICE AUTHORITY
SUMMARY OF POTENTIAL RELIABILITY ISSUES
2016 SHOULDER (with Low Gas Price Dispatch)

Element	Contingency	Potential Issue	Potential Solution
None	-	-	-

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CTCA Studies
2012 Results

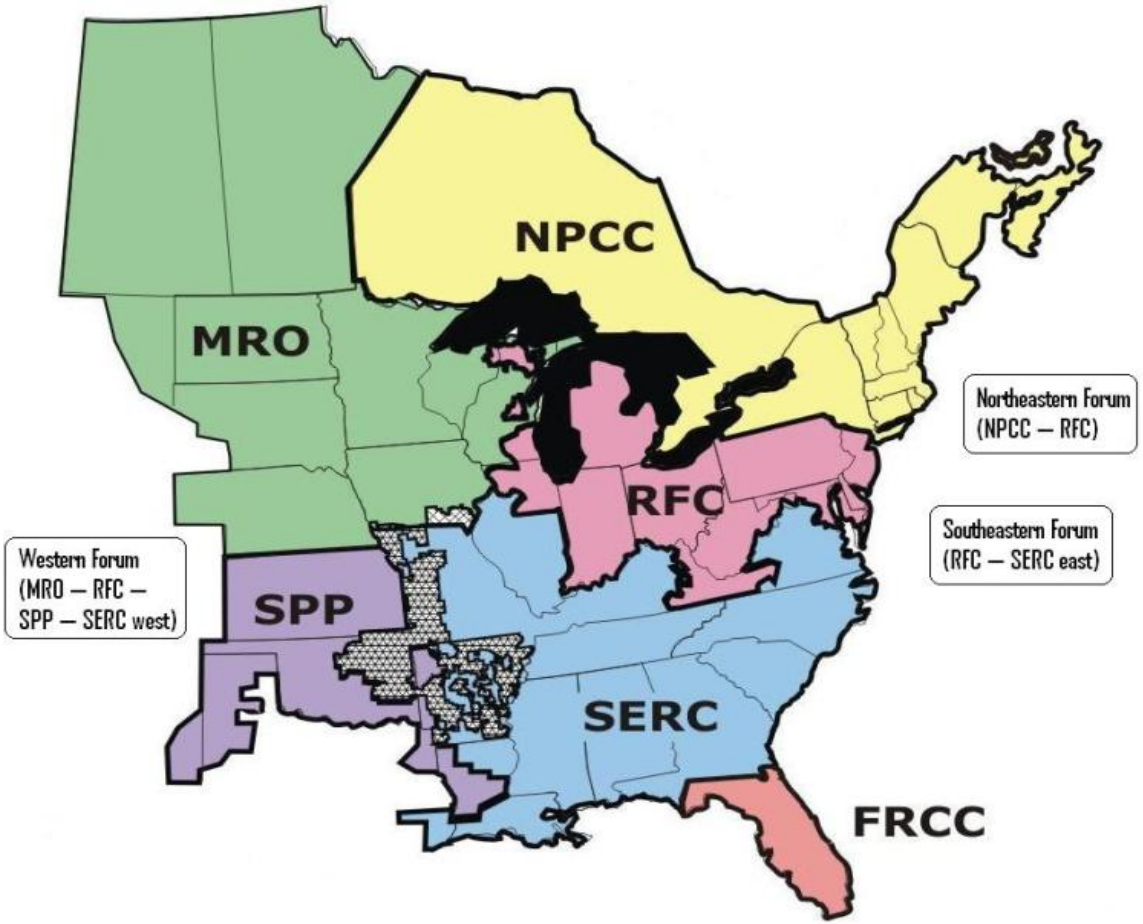
- CTCA Participants current transmission plans are simultaneously feasible
- Planning Committee did not identify the need to assess any potential joint alternatives based on the study results and a review of the participants' current transmission expansion plans

CTCA Studies

Questions?

ERAG Assessments

Jim Peterson



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SERC East-RFC-NPCC

- SERC East
  - ✓ VACAR (Duke, DVP, PEC, SCE&G, SCPSA)
  - ✓ Central (TVA, EON U.S., EKPC, BREC)
- Reliability First Corporation
  - ✓ PJM (Pennsylvania, New Jersey, Maryland)
  - ✓ MISO (Midwest Independent System Operator)

SERC East-RFC-NPCC
(CONT.)

- Northeast Power Coordinating Council
  - ✓ Northeast United States
  - ✓ Southeast Canada

SERC East-RFC-NPCC
Studies

- Seasonal and Near Term/Long Term Studies are to be prepared on a 4-year rotation.

- Rotation will consist of two assessments being performed each year.

SERC East-RFC-NPCC
Studies

- Year A Summer Year A Winter/ Year A/Year B
- 2012 2012 Summer 2012/13 Winter
- Year B Summer Year B Summer - Near Term
- 2013 2013 Summer Near Term
- Year C Summer Year C Winter Year C/Year D
- Year D Summer Year D Summer - Long Term

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SERC East-RFC-NPCC

2012/13 Winter Transmission System Assessment Scope

- Develop 2012/13 winter base case with all scheduled firm capacity backed transactions
- Determine thermal regional and sub-regional FCITCs
- Determine FCTTCs for regional and sub-regional transfers
- Study work completed Sept-October 2012
- Final Report issued December 2012

SERC East-RFC-NPCC

2012/13 Winter Final Results

- No SCE&G facilities were identified to limit transfers in the 2012/13 Winter Assessment

- No Santee Cooper facilities were identified to limit transfers in the 2012/13 Winter Assessment.

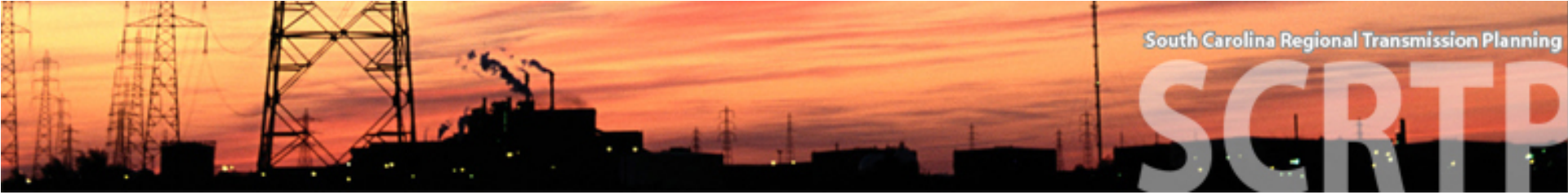
SERC East-RFC-NPCC

2013 Summer Transmission System Assessment Scope

- Develop 2013 summer base case with all scheduled firm capacity backed transactions
- Determine thermal regional and sub-regional FCITCs
- Determine FCTTCs for regional and sub-regional transfers
- Study work completed Feb-April 2013
- Final Report issued May 2013

ERAG
Reliability Assessments

Questions?



SERC LTSG Assessments

Kale Ford

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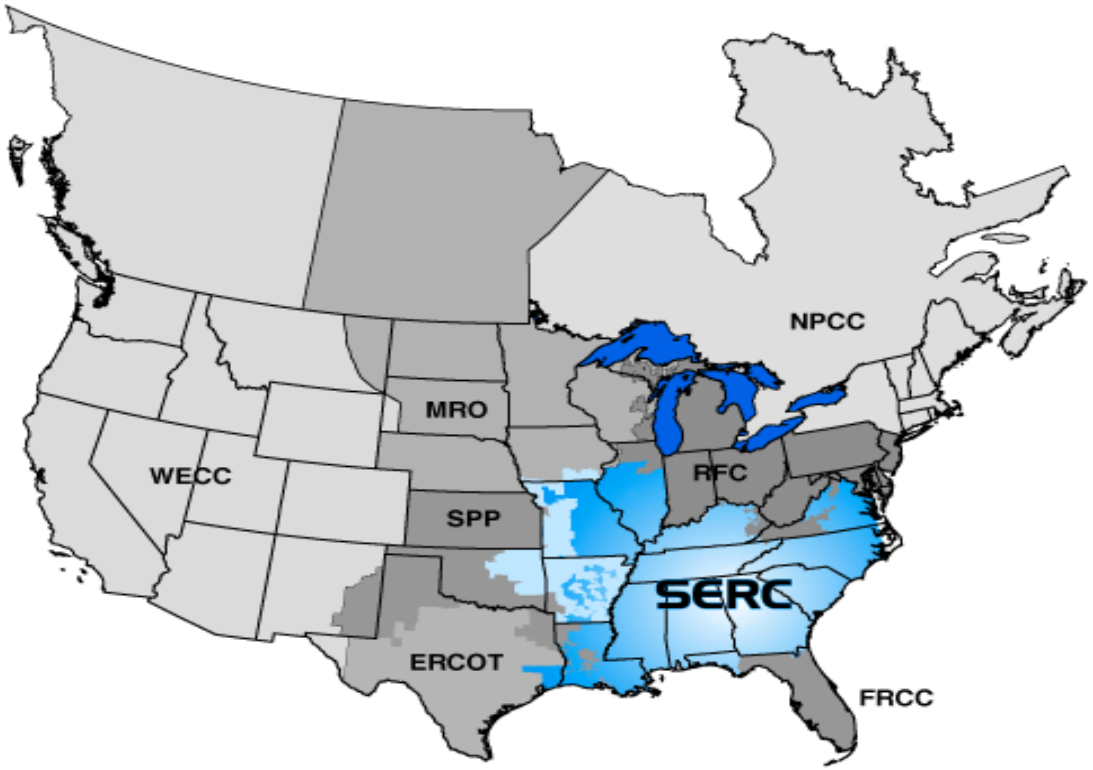
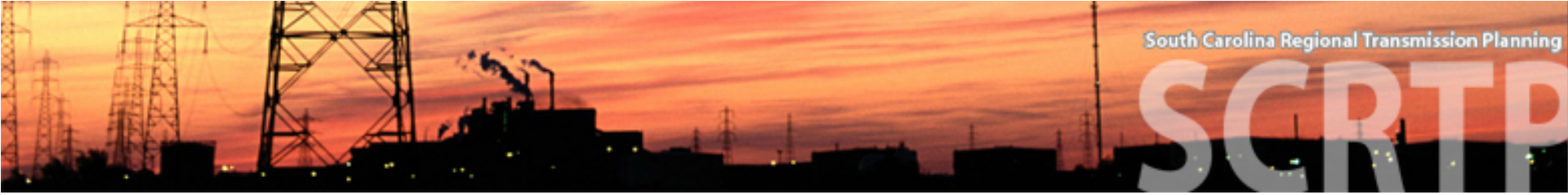
SERC Future Year Assessments
Long Term Study Group (LTSG)





SERC Long Term Study Group
Disclaimer

- The representation of future system elements in the LTSG data models is not an agreement to construct these elements in the time period shown in the models or at a later date. The configuration of each system in the models only reflects the changes that the individual system is predicting will be necessary for maintaining reliable operation. The results of studies obtained through the use of the data models developed by the LTSG will be the sole responsibility of the receiving party.

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SERC LTSG 2016 Summer 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.

SERC LTSG 2016 Summer Study
Scope

- Assess the strength of the SERC interconnected network by determining its ability to support power transfers.
- Meet NERC Reliability Standards and SERC Requirements.
- Base case is developed by the SERC LTSG Modeling Group.

SERC LTSG 2016 Summer Study
Scope (continued)

- Study results are obtained by use of PTI's MUST and PSS/E programs.
- Identify Significant Facilities under transfer analysis.
- Study completed November 2012

SERC LTSG 2016 Summer Study
Significant Facilities

- If the facility is a hard limit to a transfer
- The level at which it limits a transfer compared to the test level
- The response of the facility to the transfer
- The number of different transfers/companies impacted

SERC LTSG 2016 Summer Study
Significant Facilities (continued)

- If the facility requires the use of an operating guide
- If the outage of the facility results in the overload of numerous major transmission elements
- If an actual TLR has been called on the facility

SERC LTSG 2016 Summer Study
Variable Factors

- Load forecasts and generation availability
- Anticipated drought conditions in the SERC area
- Geographic distribution of load and generation

SERC LTSG 2016 Summer Study
Variable Factors (continued)

- Transmission system configuration
- Simultaneous inter-system power transfers
- Operation based on regional requirements to respect additional contingencies

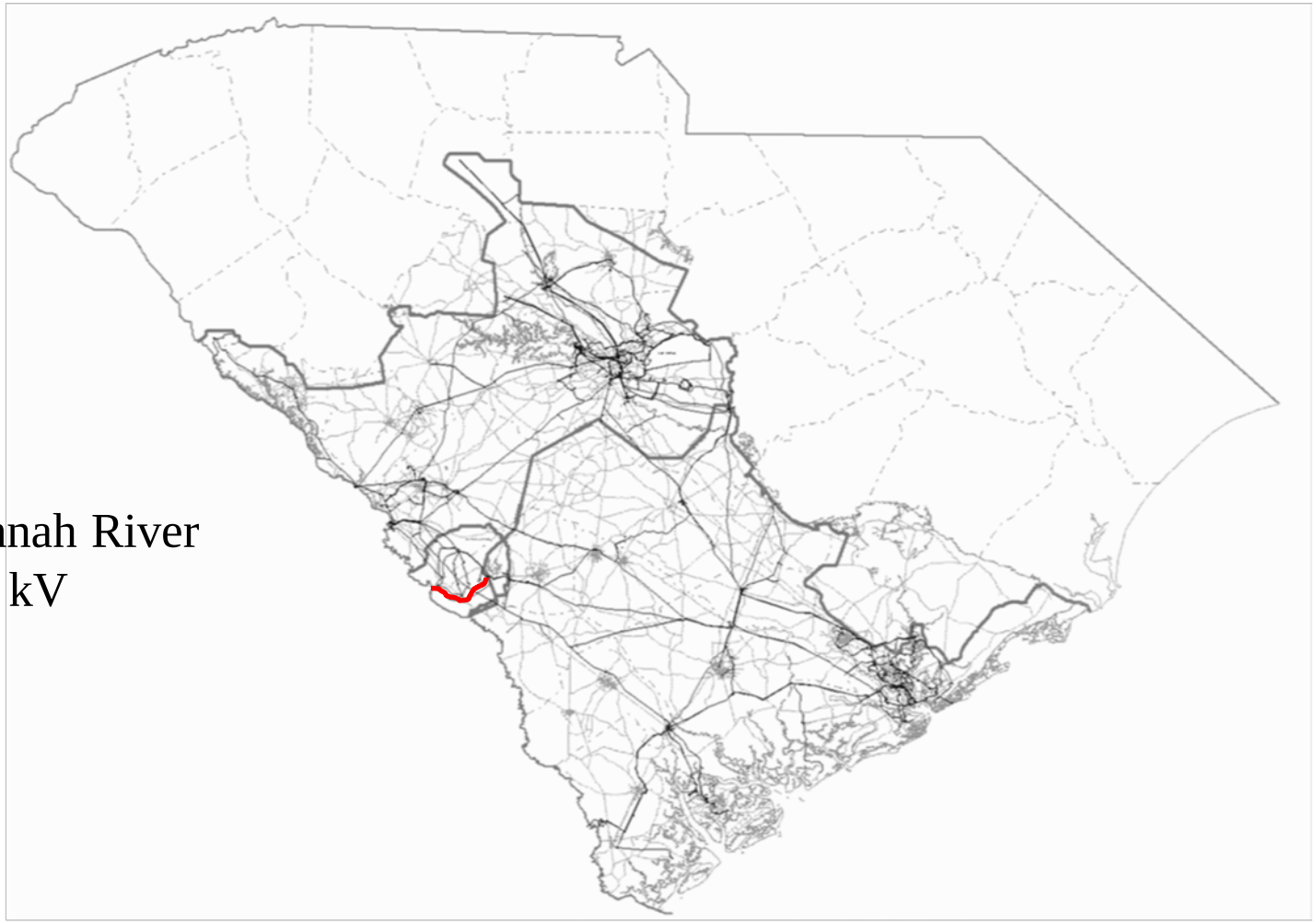
2016 LTSG Summer Reliability Study Results

Element	Contingency	Potential Issue	Potential Solution
Voglte-Savannah River Services 230 kV	Vogtle-West McIntosh 500 kV	FCITC Import limit	Evaluating

SERC LTSG 2016 Summer Study
Significant Facilities Discussion

- **Vogtle – Savannah River Services 230 kV (Southern-SCE&G)**
  - This facility can limit imports to SCE&G and SCPSA with the outage of Vogtle-West McIntosh 500 kV (Southern). The facility is being evaluated by SCE&G and Southern.

- Vogtle-Savannah River Services 230 kV



SERC LTSG Assessments

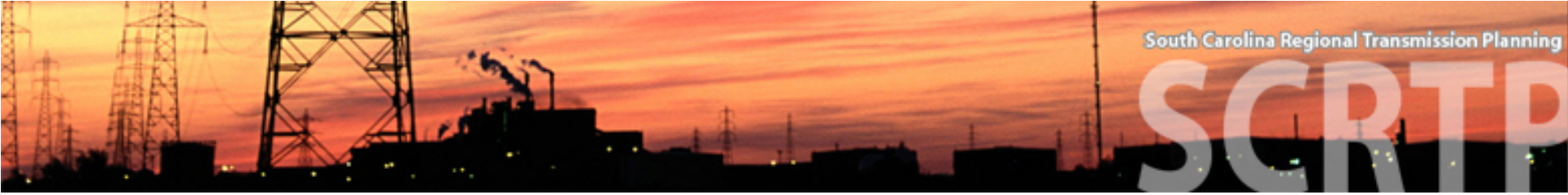
Questions?

Next SCRTP Meeting Activities

Clay Young

Next SCRTP Meeting

- Probably an online meeting
- Continue discussion of Order 1000 Inter-regional Compliance Filing
- Late March /Early April
- SCRTP Email Distribution List will be notified
- Register online
- Next regular meeting in late April



South Carolina Regional Transmission Planning

Stakeholder Meeting

SCE&G Lake Murray Training Center

Lexington, SC

January 15, 2013

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