TAG Meeting
June 19, 2012

NCEMC Office
Raleigh, North Carolina

TAG Meeting Agenda

1. Administrative Items – Rich Wodyka
2. FERC Order 1000 Report – Sam Waters
3. NCTPC 2012 Study Activities Update – James Manning
4. NCTPC Model Development Report – Lee Adams
5. Regional Studies Update – Bob Pierce
6. 2012 TAG Work Plan Update – Rich Wodyka
7. TAG Open Forum – Rich Wodyka

North Carolina Transmission Planning Collaborative

FERC Order No. 1000 Rule on Transmission Planning and Cost Allocation Compliance Update

Sam Waters

Progress Energy

FERC Order 1000 Compliance Update Agenda

- Order 1000 Compliance Timeline
- Definition and Evaluation of Regional Projects
- NCTPC Planning Timeline Including Regional Projects
- Cost Allocation for Regional Projects
- Enrollment of Non-Public TPs in the NCTPC
- Consideration of Public Policy in the Regional Planning Process
- Revision/Cancellation/Abandonment/Delay
- Review of Next Steps

Compliance Timeline

- **Q2**
  - **Refined compliance concepts**

- **Q3**
  - **NCTPC members develop and distribute drafts of compliance filing documents**
  - **TAG review/comment on draft documents**
  - **September TAG meeting - review/discuss draft of final compliance documents**

Compliance Timeline

- Q4 Regional Compliance Filing – Oct. 11, 2012
  - Regional Transmission Planning
  - Transmission Needs Driven by Public Policy
  - Cost Allocation for Regional Transmission Projects
  - Non-incumbent Transmission Providers

- Interregional Compliance Filing – Apr. 11, 2013
  - Interregional Transmission Coordination
  - Cost Allocation for Interregional Transmission Projects

Definition and Evaluation of Regional Projects

Regional Project Definition:

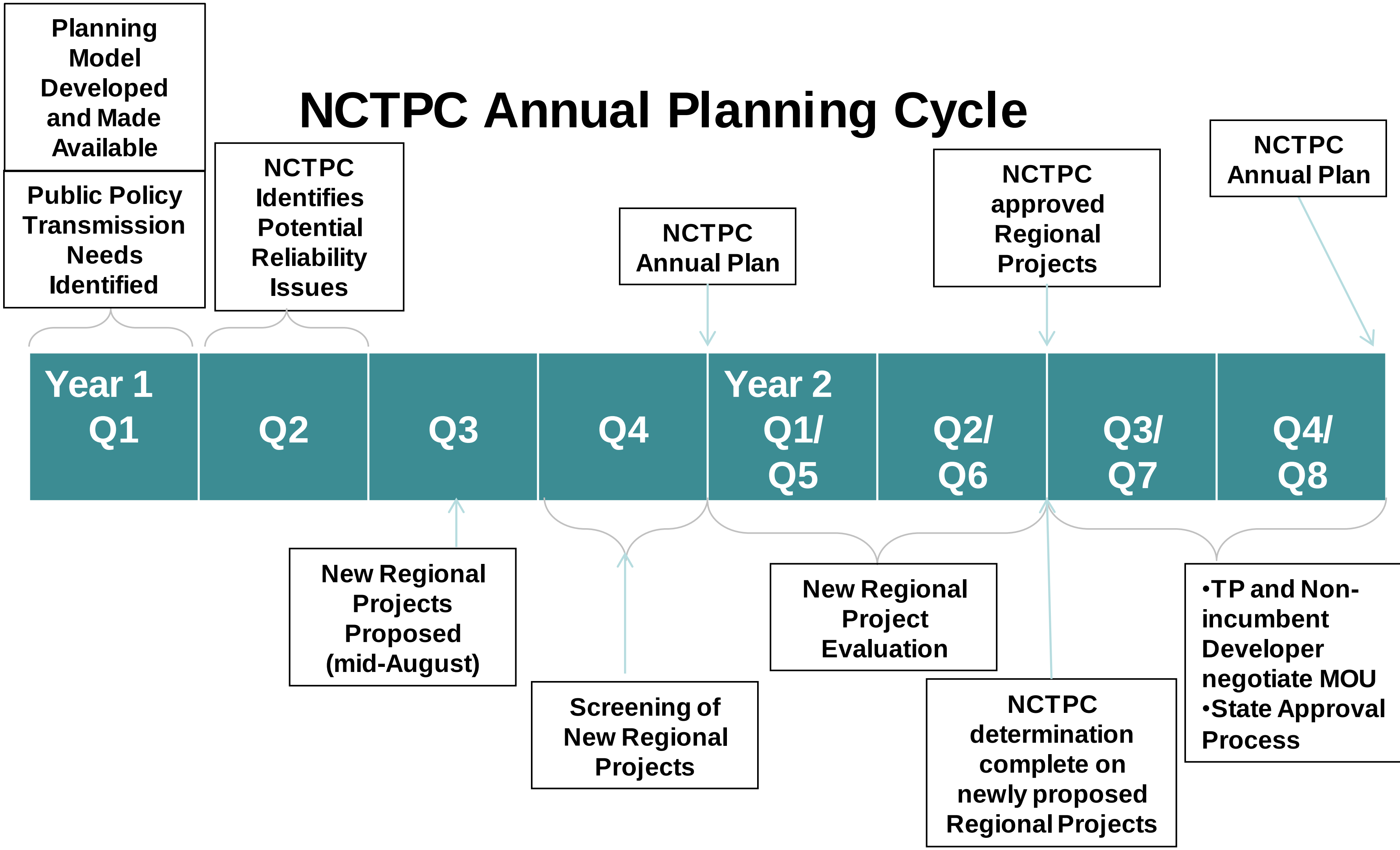
- As a general rule, encompass multiple Transmission Providers' service territories
- Voltage level of 230 kV or above
- Project cost must be at least $10 million
- Projects must be selected in the regional transmission plan for purposes of regional cost allocation
- Must be materially different than projects currently in the NCTPC Final Collaborative Transmission Plan

Definition and Evaluation of Regional Projects

Regional Project Evaluation:

- NCTPC will continue to have an annual, calendar-year planning cycle which produces a Final Plan at the end of each calendar year
- Final Plan will include both Local and Regional Projects
- Process for evaluating and selecting new Regional Projects will take place over the course of two, one-year planning cycles
- An overview of the timeline will be presented next followed by a more detailed explanation of the activities which will be taking place over the course of a two year planning period

NCTPC Annual Planning Cycle



Regional Project Development and Evaluation

NCTPC Planning Timeline

Quarter 1:

1. Q1 TAG meeting focuses on the scope of the cycle's planning activities, assumptions, criteria, etc.
2. TAG participants continue to select up to five economic studies of selected power transfers to be performed annually at no cost.
3. Models constructed and made available as per current Att. K § 5.1-5.4.
4. Determination is made regarding whether Local or Regional Projects driven by public policy may be proposed in current planning cycle

NCTPC Planning Timeline

Quarter 2:

1. **OSC/PWG performs analysis to identify reliability issues that may require solutions and discusses results with TAG, as per current Att. K § 5.5 & 5.6.**
2. **All entities that have transmission projects in the current Final Plan must provide updates on the progress of those projects (e.g., what portion is completed, delayed, etc.).**
3. **Merchant transmission developers, i.e., non-incumbents planning to construct transmission facilities whose costs will not be allocated pursuant to the Duke/Progress OATT, must provide information related to their proposed projects within the NCTPC region.**

NCTPC Planning Timeline

Quarter 3:

1. **Stakeholders may suggest solutions of any sort (transmission, generation, demand response) to the NCTPC or to potential Developers.**
2. **Developers may propose new Regional Projects by submitting a Regional Project Proposal (*see* Attachment 1 in the Strawman) during a submission window.**
   - **Submission window likely will close mid-August.**
   - **Actual costs incurred by the NCTPC to analyze Regional Projects will be borne by the Developer and a deposit of $25,000, which will be trued up based on the documented cost of the analysis, will be required for Regional Projects submittals.**
   - **Developers must identify the type of Regional Project being proposed (e.g. Reliability, Economic, and/or Public Policy – or a combination of types). The Developer must also identify the project benefits and beneficiaries as well as the proposed cost allocation to the beneficiaries. Developers must provide the supporting information related to this benefit analysis.**

NCTPC Planning Timeline

Quarter 3 (Continued):

3. **Independent Third Party Consultant (ITPC) reviews the Regional Project Proposals and ensures that they are complete. If incomplete, the Developer(s) is given an opportunity to resubmit its proposal within 14 days.**
4. **End of Quarter 3: All Regional Project Proposals will be posted; NCTPC releases information on all other proposed solutions as well.**

NCTPC Planning Timeline

Quarter 4: (Completion of annual planning cycle process)

1. OSC/PWG develops a draft NCTPC transmission plan (Draft Plan) that includes all of the Local Projects and NCTPC-approved Regional Projects (if any) and releases the Draft Plan to the Stakeholders.
2. Stakeholders provide comments on the Draft Plan.
3. During the NCTPC study process, if non-transmission alternatives have eliminated or altered the need for transmission projects, this fact will be identified in the NCTPC reports. However, the Draft (and Final) Plan will only reflect transmission projects.
4. After considering comments, OSC issues Final Plan.

NCTPC Planning Timeline

Quarter 4: (Screening Process for new Regional Projects)

1. **Screening Analysis**
   - **High-level screening analysis will be performed to screen out plainly non-viable Regional Project and/or unqualified Developers. Screens are designed to be pass/fail.**
     - **Developer Screen - OSC determines if Developer is sufficiently qualified to finance, license, and construct the facility and operate and maintain it for the life of the project.**
     - **Technical Analysis Screen - OSC/PWG reviews power flow and other technical documentation regarding all proposed Regional Projects and determines whether the Regional Project passes or fails the Technical Analysis, e.g., whether it is solves the reliability problems of the displaced local projects.**
     - **Benefit Screen**
       - **Reliability Projects – OSC determines if Regional Project solves same issues as alternative Local Project(s).**
       - **Economic Projects & Public Policy Projects - OSC reviews Developer's analysis to ensure project meets a 1.25 Benefit/Cost ratio.**
   - **If a proposed Regional Project fails the screening analysis, the Developer can seek resolution through the Dispute Resolution process as set forth in the OATT Attachment K.**

NCTPC Planning Timeline

Quarter 5 & 6: (Final Regional Project Determination)

1. **PWG and OSC, assisted by stakeholders, undertake thorough review of all Regional Projects that passed screening analyses.**
   - **Regional Project meetings will be held to fully vet the Regional Project proposals. These meetings will be open to all interested stakeholders.**
2. **OSC/PWG performs a more detailed Regional Project analysis, publishes the results of their analysis, and solicits stakeholder comment on the analysis.**
3. **OSC issues a final report (after the stakeholders have been given the opportunity to comment on the draft report) which indicates whether proposed Regional Projects were approved or rejected and how costs will be allocated for approved Regional Projects. The report will provide an explanation of the bases for such conclusions.**
4. **Approved Regional Projects will be included in Draft Plan issued in Quarter 8 (Year 2, Quarter 4).**
5. **Disputes over Regional Projects not approved will be addressed through Dispute Resolution process as set forth in the OATT Attachment K.**

NCTPC Planning Timeline

Quarter 7 & 8: (Develop Draft MOU and Seek State Approval of Regional Project)

1. **Transmission Providers and non-incumbent Developer(s) with approved Regional Projects negotiate MOU addressing the below areas:**
   - **Interconnection provisions**
   - **Responsibilities for NERC standards**
   - **OATT transmission service**
   - **Operational control and O&M responsibilities**
   - **Cost allocation**
   - **Assignment of agreement to new owner**
   - **Liability/indemnification**
2. **Developer seeks state approvals to build the Regional Project.**

Cost Allocation for Regional Projects

- New Order 1000-compliant methodology will replace existing Regional Reliability and Regional Economic Project cost allocations in current Attachment K.
- New Regional Cost Allocation methodology is applicable to following category of regional projects:
  - Reliability
  - Economic
  - Public Policy
  - Multiple Categories
- Costs will be allocated to beneficiaries in proportion to the benefits received.
  - Duke and Progress, in their roles as Transmission Providers, would be the project beneficiaries.
  - Costs allocated to Duke and Progress would in turn be recovered through their retail and wholesale transmission rates.
  - Cost allocation would be reflected in an agreement among Developer and Transmission Providers.

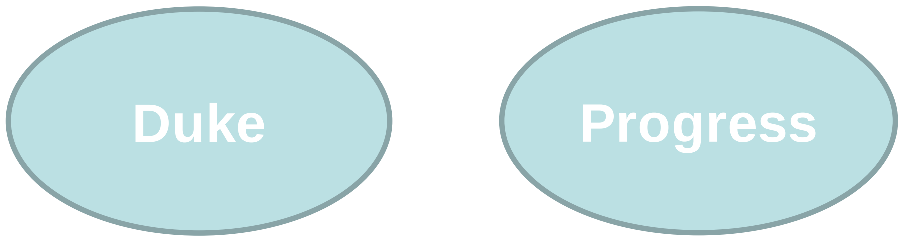
Cost Allocation for Regional Projects

- Reliability
  - Cost allocation based on avoided transmission cost
- Economic
  - Cost allocation is based on proportion that load-serving entities in the Transmission Providers' service areas would benefit from the project.
- Public Policy
  - Cost would be allocated to the Transmission Providers' based on the extent to which load serving entities in the service territory will be able to access the resources enabled by the project that are needed to meet their public policy requirements.

Cost Allocation for Regional Projects

Example 1 - Regional Reliability Project

- Regional reliability project where Duke and Progress each receive benefits from the project
- Duke and Progress are the Transmission Project Developers



Assumptions:

- Total cost of the Regional Reliability Project = $400 M
- Avoided Transmission Cost:
  - Duke = $300 M
  - Progress = $150 M

Regional Cost Allocation:

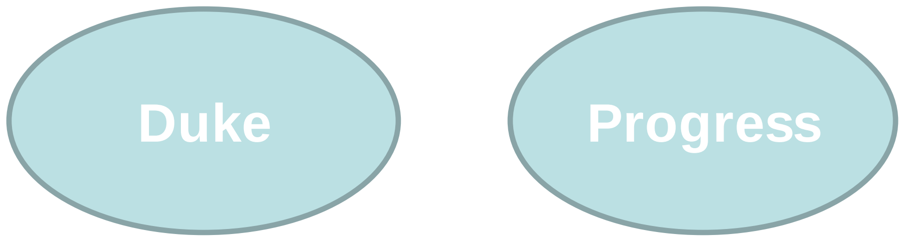
- Project beneficiaries:
  - Duke = 2/3 of TRR of Regional Reliability Project
  - Progress = 1/3 of TRR of Regional Reliability Project

Note: Cost allocation could be percentage of FERC approved transmission revenue requirements for a non-incumbent developer

Cost Allocation for Regional Projects

Example 2 - Regional Economic Project

- Regional Economic Project where Duke and Progress transmission customers are beneficiaries
- Duke and Progress are the Transmission Project Developers



Example Assumptions:

- Total cost of the Regional Economic Project = $500 M
- Project beneficiaries: Duke = 50%; Progress = 50%

Regional Cost Allocation:

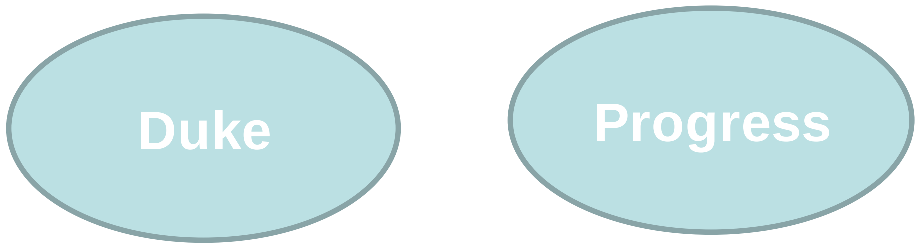
- Project beneficiaries:
  - Duke = 1/2 of TRR of Regional Economic Project
  - Progress = 1/2 of TRR of Regional Economic Project

Note: Cost allocation could be percentage of FERC approved transmission revenue requirements for a non-incumbent developer

Cost Allocation for Regional Projects

Example 3 - Regional Public Policy Project

- Regional Public Policy Project where Duke and Progress transmission customers benefit
- Non-incumbent Transmission Project Developer



Example Assumptions:

- Total project cost = $1 B; Non-incumbent transmission developer cost = $1 B
- Project beneficiaries: Duke = 40%; Progress = 60%

Regional Cost Allocation:

- Project beneficiaries:
  - Duke = 2/5 of TRR of Regional Public Policy Project
  - Progress = 3/5 of TRR of Regional Public Policy Project

Enrollment of non-Public TPs in the NCTPC

- Order 1000-A identified new "enrollment" requirements that are related to identifying the transmission providers that will be allocated cost in the transmission planning regions
- At this time, the NCTPC region does not have any non-public utility transmission providers that are expected to enroll
- However, to comply with the Order 1000-A requirements the following OATT provisions will be added:
  - A list of all public and non-public utility transmission providers in the NCTPC will be provided
  - All entities must have an OATT on file with FERC and must be registered with NERC as a Planning Authority and a Transmission Service Providers to qualify for enrollment in the NCTPC
  - Cost of Regional Projects will be allocated to enrolled Transmission Providers

Enrollment of non-Public TPs in the NCTPC

- **An entity does not need to be enrolled to be a Developer of a Regional Project**
- **Enrolled Transmission Providers perform transmission planning for load in the accordance with their obligations under state law, the OATT, and NERC Reliability Standards.**

Consideration of Public Policy in the Regional Planning Process

- NCTPC will annually hold a stakeholder process to determine if any public policies exist that drive transmission.

- Criteria for determining if public policy drives transmission need:
  - Public policy must be reflected in an existing state or federal law or regulation (including order of a state or federal agency).
  - Public policy will drive a transmission need that is not readily met via requests for new generator interconnection and/or transmission service (e.g., if a state enacted a public policy requirement to build transmission to bring in off-shore wind energy into the region).

- OSC will issue decision as to whether public policy is driving a transmission need that is not otherwise readily met. If public policy(ies) are identified, Local Projects and Regional Projects may be proposed by stakeholders (including Developers) as solutions to those needs.

Revision/Cancellation/Abandonment/Delays

- NCTPC may change/revise/cancel a Regional Project included in the Final Plan if subsequent events result in a finding that the expected benefits of the Regional Project will be significantly different due to a change in circumstances.

- Process if Developer abandons Regional Project
  - For Regional Reliability Projects, impacted TPs will have a ROFR under the OATT to try to complete the project or propose an alternate solution. If the Registered Entity believes that abandonment will cause a NERC violation, the Registered Entity should submit a mitigation plan to address the violation.
  - For Economic or Public Policy Projects, the NCTPC will provide notice to stakeholders and Developers may offer to step in and try and complete the project, subject to obtaining necessary regulatory approvals.

Revision/Cancellation/Abandonment/Delays

- Delays in completion of Regional Project
  - If a delay in the completion of a Regional Reliability Project could potentially cause a Registered Entity to violate a Reliability Standard, the Registered Entity should inform the NCTPC as soon as it is aware of the possibility.
  - Registered Entity may propose solutions within its retail distribution service territory or footprint that will enable it to meet its reliability needs or service obligations caused by the Regional Project delay.

Review of Next Steps

- Tag invited to provide written comments on the strawman proposal to OSC by July 3rd.
- Special interim NCTPC OSC meetings continue to develop specifics of compliance proposals.
- Development of specific compliance plans is ongoing.
- Duke and Progress will begin to draft tariff language around agreed upon compliance provisions.
- Next TAG update scheduled for September.

Questions ?

NCTPC 2012 Study Activities Update

James Manning

NCEMC

Purpose of Study

- **Assess Duke and Progress transmission systems' reliability and develop a single Collaborative Transmission Plan**

Steps and Status of the Study Process

Completed

1. Assumptions Selected
2. Study Criteria Established
3. Study Methodologies Selected
4. Models and Cases Developed
5. Technical Analysis Performed
6. Problems Identified and Solutions Developed
7. Collaborative Plan Projects Selected
8. Study Report Prepared

Study Assumptions Selected

- **Study Years for reliability analyses:**
  - **Near-term: 2017 Summer, 2017/2018 Winter**
  - **Longer-term: 2022 Summer**
  - **Inter-regional study: 2027 Summer**
- **LSEs provided:**
  - **Input for load forecasts and resource supply assumptions**
  - **Dispatch order for their resources**
- **Interchange coordinated between Participants and neighboring systems**

Study Criteria Established

- NERC Reliability Standards
  - Current standards for base study screening
  - Current SERC Requirements
- Individual company criteria

Study Methodologies Selected

- Thermal Power Flow Analysis
- Each system (Duke and Progress) will be tested for impact of other system’s contingencies

Base Case Models Developed

- Started with 2011 series MMWG cases
- Detailed models for Duke and Progress systems
  - Includes new rating methodology for Duke
- Adjustments were made based on additional coordination with neighboring transmission systems (i.e. updated PJM dispatch)
- Planned transmission additions from updated 2011 Plan were included in models

Resource Supply Options Selected

- **Last year**
  - **Hypothetical import/export scenarios**
  - **Hypothetical new base load generation**
  - **Offshore wind**

- **This year**
  - **Hypothetical new base load generation**
  - **NCTPC-PJM inter-regional wind study**

Hypothetical New Generation

- **Davidson County**
- **500 MW Base Load**
- **Sink/Source in Duke**

NCTPC-PJM Inter-regional Wind Study

- Renewable wind generation located off the North Carolina and Virginia coasts
- Study Year 2027, Studied at 60% peak load
- Three scenarios that vary:
  - Total MWs
  - Allocation of MWs to Injection Points
  - Allocation of MWs sinking in Duke, PEC, and PJM

Offshore Wind Scenarios

Location	Scenario #1	Scenario #2	Scenario #3
	MWs by Injection Point		
PJM / Dominion Landstown	1,000	2,000	4,500
NCTPC / Morehead City	1,000	1,500	3,500
NCTPC / Southport	1,000	1,500	2,000
TOTAL MWs Injected	**3,000**	**5,000**	**10,000**
	MWs by Sink Location		
PJM	0	2,000	6,000
NCTPC (40% PEC / 60% Duke)	3,000	3,000	4,000

These MW levels are assumed to occur during the off-peak period.
On-peak MW assumptions are approximately 40% of these values.

Recently Approved PJM Upgrades

- **During May 2012, PJM Board approved additional reliability RTEP baseline upgrades totaling $1.881B to address generation deactivations ranging from May 2012 through end of 2015.**
- **Included deactivations at Dominion's Chesapeake (576MW) & Yorktown (159MW)**
  - **Triggered need for approx. $150M in upgrades**
- **Another $330M approved in Dominion area**

Enhanced Transmission Access Requests

- **TAG memo was distributed on January 19, 2012 requesting input**
- **The deadline for input was February 10, 2012**

- ***No requests were received for 2012***

Technical Analysis

- Conduct thermal screenings of the 2017 and 2022 base cases
- Conduct thermal screenings of the 2022 hypothetical generation Resource Supply Option
- Conduct thermal screenings of the 2027 Offshore Wind Scenarios
  - Coordination with PJM on target

Problems Identified and Solutions Developed

- **Identify limitations and develop potential alternative solutions for further testing and evaluation**
- **Estimate project costs and schedule**

Collaborative Plan Projects Selected

- Compare all alternatives and select preferred solutions

Study Report Prepared

- Prepare draft report and distribute to TAG for review and comment

Questions ?

NCTPC Model Development Report

Lee Adams

Progress Energy

Compare 2011 Cases with 2012 Cases

2011 Cases

2016 Summer

2016 Winter

2021 Summer

2012 Cases

2017 Summer

2017 Winter

2022 Summer

2027 Summer (60% Case)

		2011 Case	2012 Case	
		2016S	2017S	Diff
PEC	Eastern Load	13350	13235	-115
	Eastern Interchange	-1086	-1137	-51
PEC	Western Load	987	963	-24
	Western Interchange	149	-1	-150
DUKE	System Load	21477	22293	816
	Interchange	135	326	191

		2011 Case	2012 Case	
		2016W	**2017W**	**Diff**
PEC	**Eastern Load**	12174	11907	-267
	Eastern Interchange	-433	-790	-357
PEC	**Western Load**	1127	1100	-27
	Western Interchange	-551	-401	150
DUKE	**System Load**	20706	21511	805
	Interchange	427	822	395

		2011 Case	2012 Case	
		2021S	2022S	Diff
PEC	Eastern Load	14366	14225	-141
	Eastern Interchange	-1061	-1225	-164
PEC	Western Load	1068	1043	-25
	Western Interchange	149	-1	-150
DUKE	System Load	23003	23930	927
	Interchange	401	535	134

Generation		
	PEC	No New Retirements or New Generation
	DUKE	No New Retirements or New Generation
Transmission Projects		
	PEC	Greenville-Kinston DuPont 230kV Line (June 1, 2017)
	DUKE	No New Transmission Projects

		2012 Case
		2027S (60% Case)
PEC	Eastern Load	9311
	Eastern Interchange	-650
PEC	Western Load	680
	Western Interchange	-1
DUKE	System Load	15051
	Interchange	3

Questions ?

Regional Studies Reports

Bob Pierce

Duke Energy

Eastern Interconnection Planning Collaborative (EIPC)

EIPC background

- EIPC Objectives
  1. Integration ("roll-up") and analysis of approved regional plans
  2. Development of possible interregional expansion scenarios to be studied
  3. Development of interregional transmission expansion options

EIPC Structure

Eastern Interconnection Planning Collaborative (EIPC)
(Open Collaborative Process)

EIPC Analysis Team
Principal Investigators
Planning Authorities

Steering Committee

Stakeholder Work Groups

Executive Leadership

Technical Leadership & Support Group

Stake-holder Groups

States

Provinces

Federal

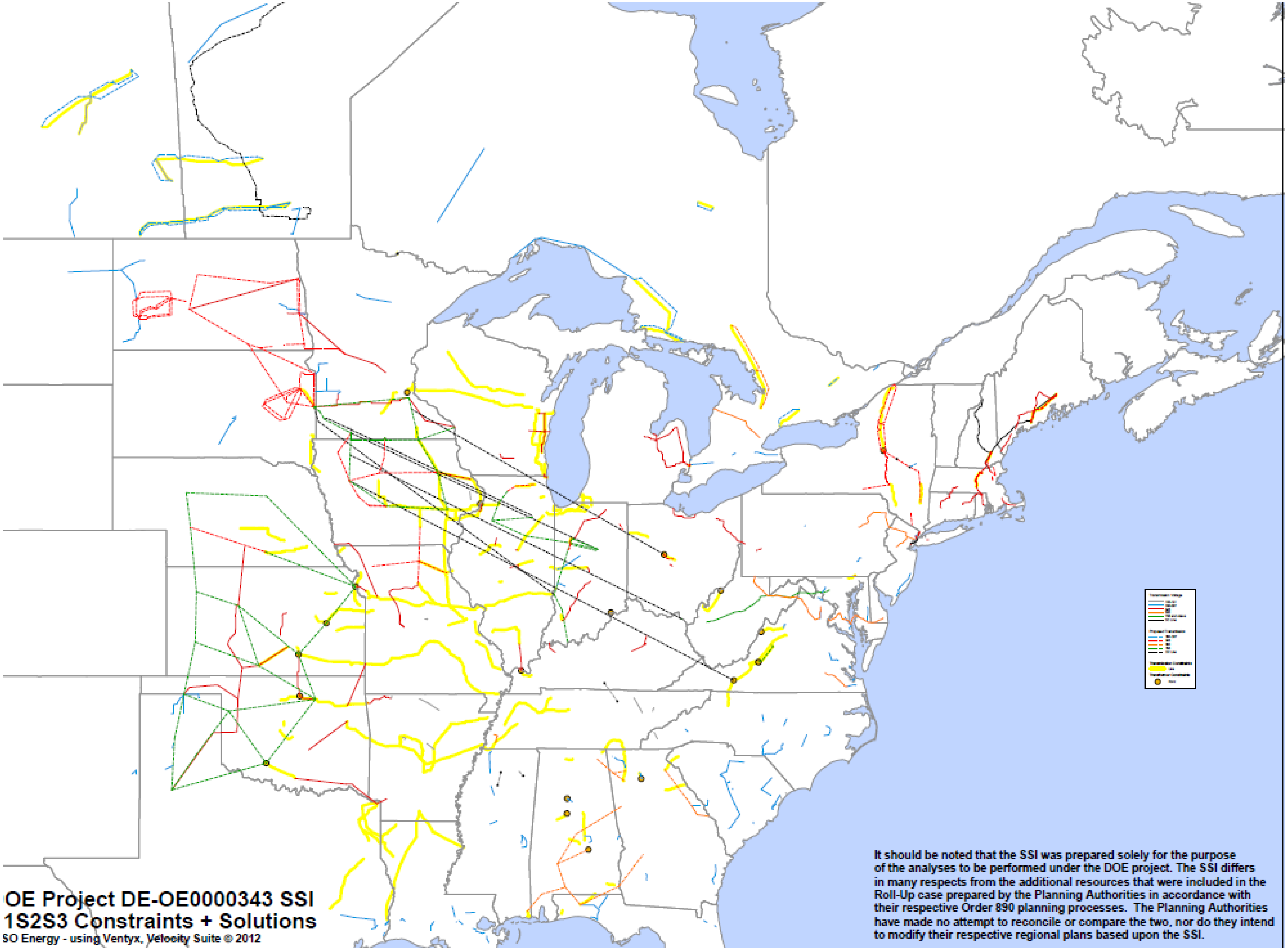
Owners Operators Users

. . .

EIPC Focus

Phase II

- Analyze the 3 scenarios selected by the SSC.
  - Scenario 1 - Nationally Implemented Federal Carbon Constraint with Increased EE/DR
  - Scenario 2 - Regionally-Implemented National RPS Scenario
  - Scenario 3 - Business as Usual Scenario


OE Project DE-OE0000343 SSI
1S2S3 Constraints + Solutions
SO Energy - using Ventyx, Velocity Suite © 2012
It should be noted that the SSI was prepared solely for the purpose of the analyses to be performed under the DOE project. The SSI differs in many respects from the additional resources that were included in the Roll-Up case prepared by the Planning Authorities in accordance with their respective Order 890 planning processes. The Planning Authorities have made no attempt to reconcile or compare the two, nor do they intend to modify their respective regional plans based upon the SSI.

EIPC Future

The EIPC was originally set up to foster an open and transparent process to perform technical analysis of the interconnected transmission in the eastern portion of the United States and Canada.

EIPC Future

In recognizing the completion of DOE project work and transition to the new scope of work:

- Portions of the EIPC Agreement will become inactive following the completion of the DOE funded project.
- As initially envisioned in the EIPC Agreement, the focus of the EIPC beginning in 2013 will be on the roll-up of the regional plans and analysis of those regional plans
- As initially envisioned in the EIPC Agreement, the Planning Authorities will continue to work with federal, state and provincial representatives to seek their input on analyses that may of interest to them and other policy makers.
- The EIPC Planning Authorities are currently working on detailed scope of work and budget for 2013.

EIPC Future

Thoughts on 2013 stakeholder structure

- Forum for input to Planning Authorities
- Establish new on-going processes that are not dependent on the DOE project structure nor the funding from DOE
- Use the experienced gained during the DOE funded project, to establish an open membership stakeholder body with transparent processes, where all stakeholders can provide input.
- Develop consensus input to the extent possible
- Prioritize inter-regional evaluations of interest
- Open to participation by FERC and DOE
- Prominent Role for the States and EISPC
- States' activities (EISPC) funded through their own mechanism & stakeholders' participation is self-funded

http://www.eipconline.com/

Southeast Inter-Regional Participation Process (SIRPP)

Power Flow Cases Utilized

- 2013 Study Years
  - 2011 Series MMWG: 2013 Summer Peak
- 2017 Study Years
  - 2011 Series MMWG: 2017 Summer Peak
- All SIRPP areas coordinated interchange and system updates to the model for the respective study years

The Five Economic Planning Studies

- SCE&G to Progress Energy Carolinas (200 MW)
  - Study Year: 2017
- Southern Company to Duke Energy Carolinas (50 MW)
  - Study Year: 2017
- SCRTP to FRCC (200 MW)
  - Study Year: 2017
- LG&E/KU to Southern Company (200 MW)
  - Study Year: 2013
- Southern Company to LG&E/KU (200 MW)
  - Study Year: 2013

Southeast Inter-Regional PARTICIPATION PROCESS

SCE&G to PEC

Transmission System Impacts for the SIRPP

- Two (3) 230 kV Lines
- One (1) 230/115 kV XFMR
- Five (5) 115 kV Lines

Total Cost: $35,715,000

SCE&G to PEC – PEC Screen Results

❖ Significant Constraints

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
(PEC) Sumter – (SCE&G) Wateree Plant 230 kV Line	475	91.4	95.1
(PEC) Darlington Co. – (SCPSA) S. Bethune 230 kV Line	478	85.3	90.3

SCE&G to PEC – PEC Screen Results

- <u>Projects Identified</u>

Item	Proposed Enhancements	Cost ($)
P1	Upgrade Wave Trap to 2000 A and Rework Protective Relay at (PEC) Sumter terminal.	500,000
P2	Rework Protective Relay at (PEC) Darlington Co. terminal.	500,000

Total Cost (2012$) = $1,000,000

SCE&G to PEC – SCE&G Screen Results

❖ Significant Constraints

Limiting Elements	Rating (MVA)	Thermal Loading (%) Without Request	Thermal Loading (%) With Request
Denmark-Cope 115 kV	138.8	81.5	90.1
Denmark-Cope 115 kV	138.8	99.8	107.9
Graniteville-Aiken 3 Tap 115 kV	165.3	86.6	90.1
Church Creek 230/115 kV	224	89.1	93.3

SCE&G to PEC – SCE&G Screen Results

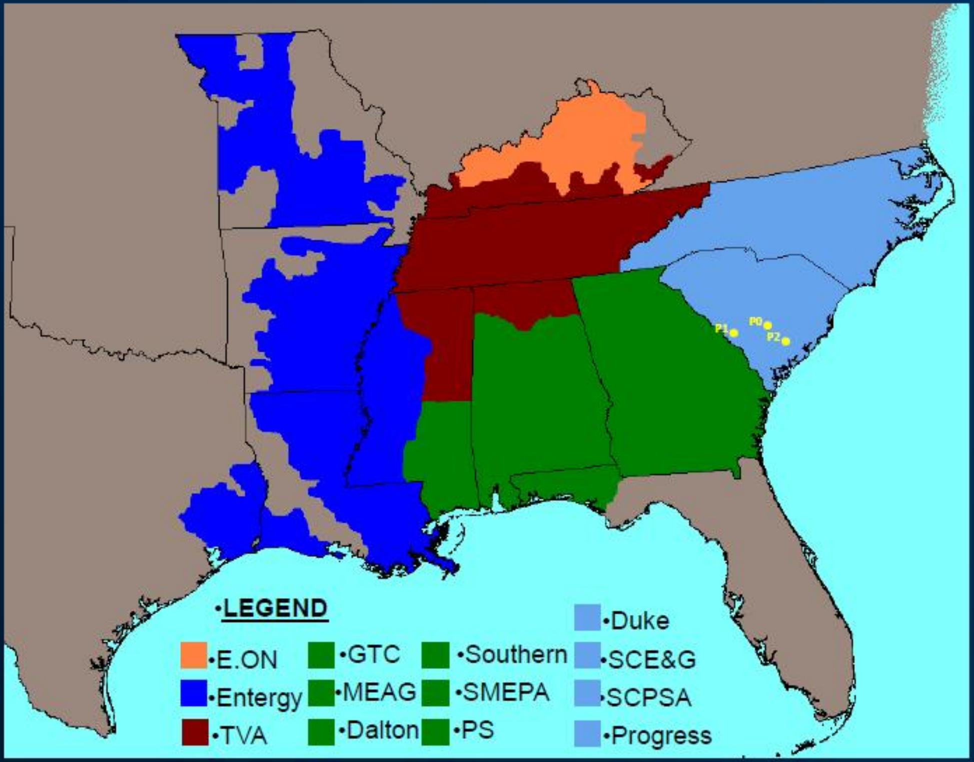
- Projects Identified

Item	Proposed Enhancements	Cost ($)
P0	Denmark to Cope 115 kV rebuild 13 miles to 1272 ACSR	8,200,000
P1	Re-conductor break drops to 1272 ACSR at Graniteville and Aiken 3	15,000
P2	3rd 230/115 kV transformer at Church Creek	4,500,000

Total Cost (2012$) = $12,715,000

Southeast Inter-Regional PARTICIPATION PROCESS

SIRPP Region Map



Southeast Inter-Regional PARTICIPATION PROCESS

SCE&G to PEC – SOCO Screen Results

❖ Significant Constraints

Limiting Elements	Rating (MVA)	Thermal Loading (%) Without Request	Thermal Loading (%) With Request
South Hall – Candler 230 kV Line	509	96.9	102.4
Nunez J – Stillmore 115 kV Line	79	97.8	102.4
Yates – Madras 115 kV Line	155	98.3	102.7
Louisville JCT – Waynesboro 115 kV Line	124	99.1	103.4

SCE&G to PEC – SOCO Screen Results

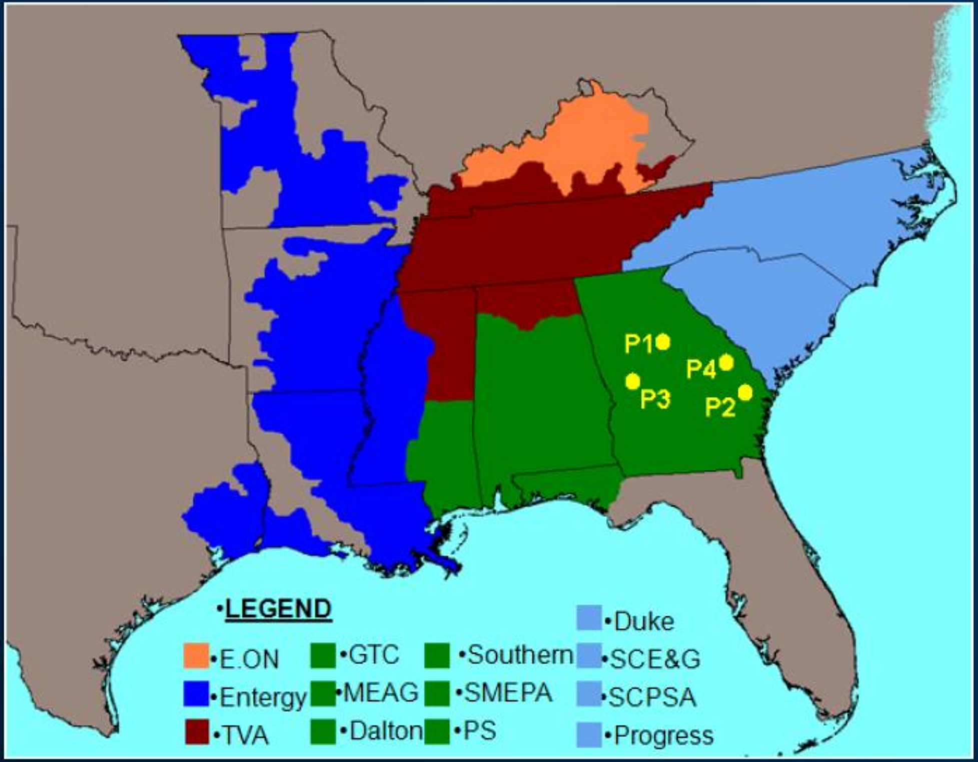
❖ Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	Reconductor S Hall – Candler 230 kV Line with 1033.5 ACSR @ 100C	750,000
P2	Upgrade Nunex J – Stillmore 115 kV Line to 100C	1,750,000
P3	Reconductor Yates – Madras 115 kV Line with 1033 ACSR @ 100C	7,000,000
P4	Reconductor Louisville JCT – Waynesboro 115 kV Line with 795 ACSR @ 100C	12,500,000

Total Cost (2012$) = $22,000,000

Southeast Inter-Regional PARTICIPATION PROCESS

SIRPP Region Map



SOCO to Duke

Transmission System Impacts for the SIRPP

- One (1) 230/115 kV XFMR
- Five (4) 115 kV Lines

Total Cost: $21,465,000

Southeast Inter-Regional PARTICIPATION PROCESS

SOCO to Duke – SCE&G Screen Results

- Significant Constraints

Limiting Elements	Rating (MVA)	Thermal Loading (%) Without Request	Thermal Loading (%) With Request
Denmark-Cope 115 kV	138.8	81.5	91.4
Denmark-Cope 115 kV	138.8	99.8	109.2
Graniteville-Aiken 3 Tap 115 kV	165.3	94.9	101.6
Church Creek 230/115 kV	224	89.1	93.9

SOCO to Duke – SCE&G Screen Results

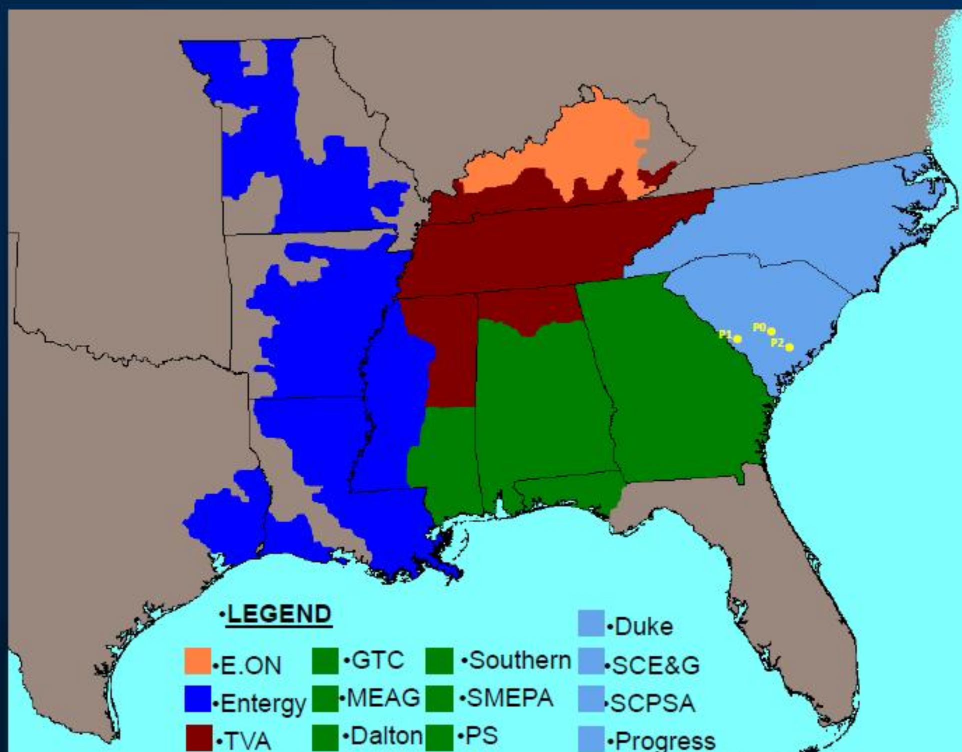
❖ Projects Identified

Item	Proposed Enhancements	Cost ($)
P0	Denmark to Cope 115 kV rebuild 13 miles to 1272 ACSR	8,200,000
P1	Re-conductor break drops to 1272 ACSR at Graniteville and Aiken 3	15,000
P2	3rd 230/115 kV transformer at Church Creek	4,500,000

Total Cost (2012$) = $12,715,000

Southeast Inter-Regional PARTICIPATION PROCESS

SIRPP Region Map



Southeast Inter-Regional PARTICIPATION PROCESS

SOCO to DUKE – SOCO Screen Results

❖ Significant Constraints

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
Yates – Madras 115 kV Line	155	98.3	102.8
Nunez J – Stillmore 115 kV Line	79	97.8	103.8

SOCO to DUKE – SOCO Screen Results

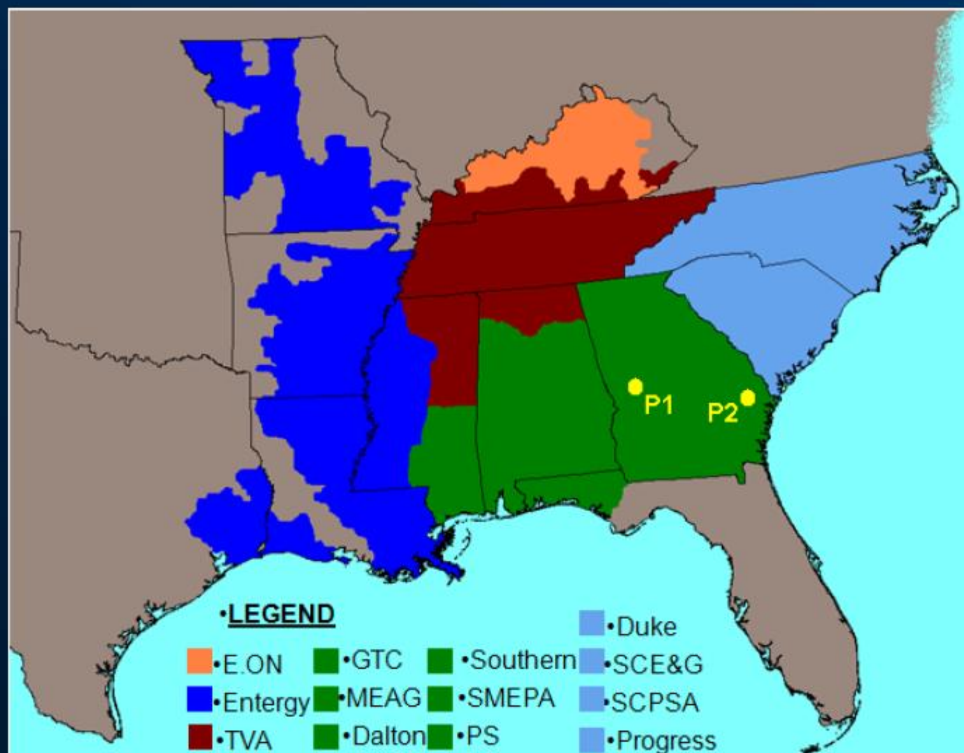
❖ Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	Reconductor Yates – Madras 115 kV Line with 1033 ACSR @ 100C	7,000,000
P2	Upgrade Nunex J – Stillmore 115 kV Line to 100C	1,750,000

Total Cost (2012$) = $8,750,000

Southeast Inter-Regional PARTICIPATION PROCESS

SIRPP Region Map



SCRTP to FRCC

Transmission System Impacts for the SIRPP

- One (1) 500 kV Static-Var Compensator
- Two (2) 230 kV Lines
- One (1) 230/115 kV XFMR
- Five (4) 115 kV Lines

Total Cost: $128,465,000

SCRTP to FRCC

Transmission System Impacts for FRCC

- One (1) 500 kV Static-Var Compensator

SCRTP to FRCC – FRCC Screen Results

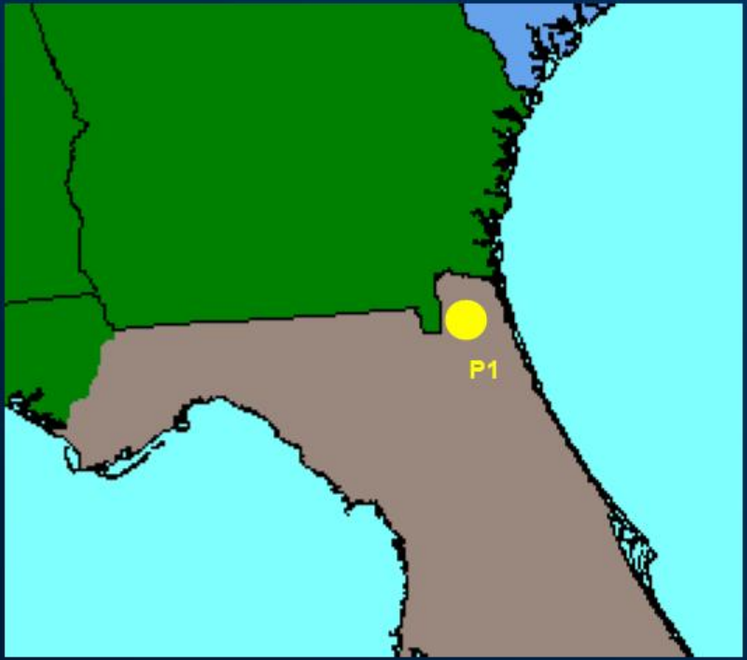
❖ Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	Construct a 500 kV +500/-100 Mvar SVC at the Duval substation	$100,000,000

Total Cost (2012$) = $100,000,000

Southeast Inter-Regional PARTICIPATION PROCESS

SIRPP Region Map



SCRTP to FRCC – SCE&G Screen Results

- Significant Constraints

Limiting Elements	Rating (MVA)	Thermal Loading (%) Without Request	Thermal Loading (%) With Request
Denmark-Cope 115 kV	138.8	81.5	91.0
Denmark-Cope 115 kV	138.8	99.8	108.6
Graniteville-Aiken 3 Tap 115 kV	165.3	85.5	91.0
Graniteville-Aiken 3 Tap 115 kV	165.3	94.9	100.4
Graniteville-Aiken 3 Tap 115 kV	165.3	85.5	91.0
Church Creek 230/115 kV	224	89.1	93.0

SCRTP to FRCC – SCE&G Screen Results

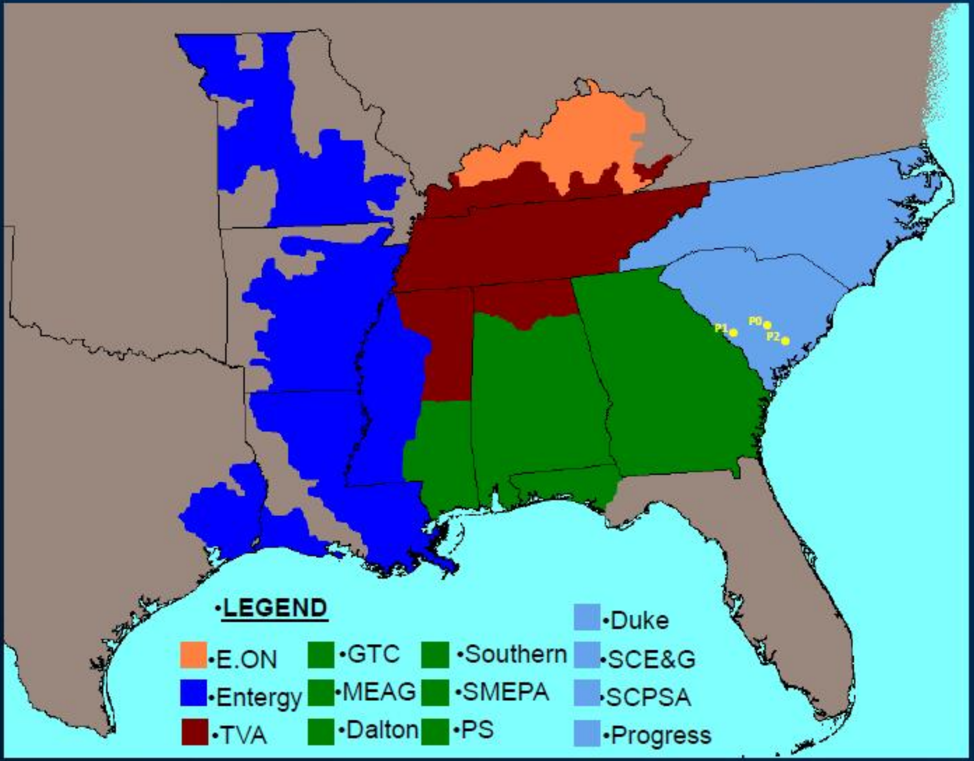
- Projects Identified

Item	Proposed Enhancements	Cost ($)
P0	Denmark to Cope 115 kV rebuild 13 miles to 1272 ACSR	8,200,000
P1	Re-conductor break drops to 1272 ACSR at Graniteville and Aiken 3	15,000
P2	3rd 230/115 kV transformer at Church Creek	4,500,000

Total Cost (2012$) = $12,715,000

Southeast Inter-Regional PARTICIPATION PROCESS

SIRPP Region Map



SCRTP to FRCC – SOCO Screen Results

❖ Significant Constraints

Limiting Elements	Rating (MVA)	Thermal Loading (%) Without Request	Thermal Loading (%) With Request
Lawrenceville - Purcell Rd 230kV Line	509	92.9	102.9
Louisville JCT – Waynesboro 115 kV Line	124	99.1	103.8
NASA – Logtown West 115kV TL	216	89.7	103.9
South Hall – Candler 230 kV Line	509	96.9	105.1

SCRTP to FRCC – SOCO Screen Results

- Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	Reconductor Lawrenceville – Purcell Rd 230 kV Line with 1351.5 SSAC @ 170C	2,500,000
P2	Reconductor Louisville JCT – Waynesboro 115 kV Line with 795 ACSR @ 100C	12,500,000
P3	Reconductor NASA – Logtown West 115 kV Line with 795 ACSS @ 160C	1,250,000
P4	Reconductor S Hall – Candler 230 kV Line with 1033.5 ACSR @ 100C	750,000

Total Cost (2012$) = $17,000,000

Southeast Inter-Regional PARTICIPATION PROCESS

SIRPP Region Map

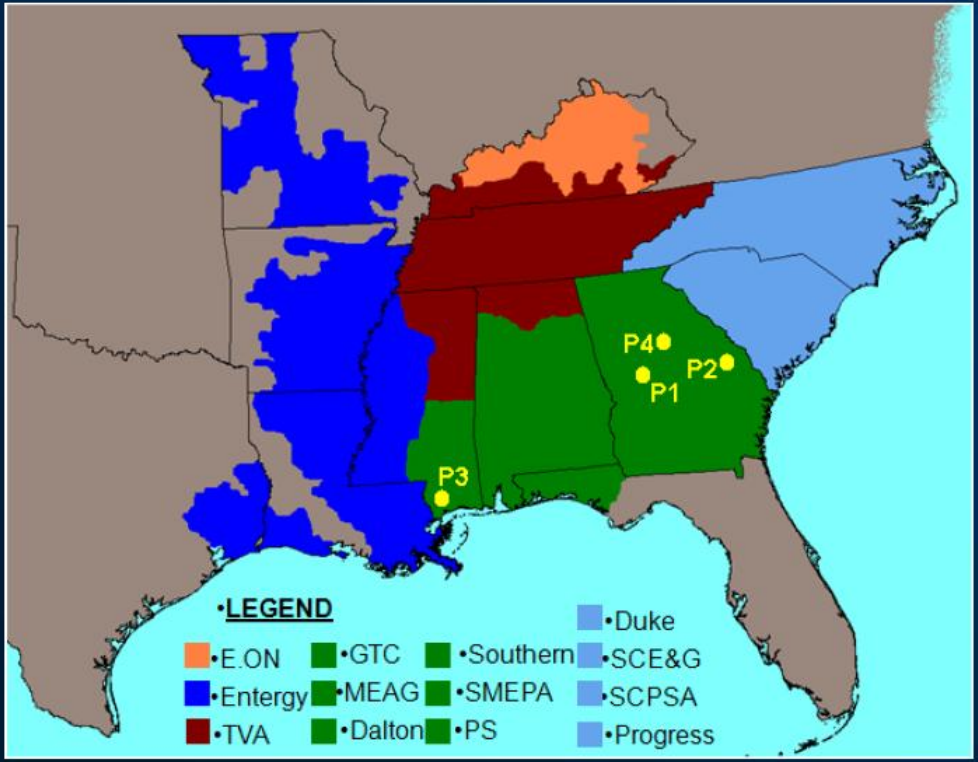


Table 2: SIRPP Transfers - Potential Solution Summary

	Entergy Facilities	Southern Facilities	TVA Facilities	Duke Facilities	SCE&G Facilities	SCPSA Facilities	PEC Facilities	LG&E/KU Facilities	Total Cost
SCE&G to PEC (200 MW)	None Reported	1-230 kV 3-115 kV	None Reported	None Reported	1-230/115 kV 2-115 KV	None Reported	2-230 kV	None Reported	1-230/115 kV 3-230 kV 6-115 KV
Cost	$0	$22,000,000	$0	$0	$12,715,000	$0	$1,000,000	$0	**$35,715,000**
Southern to DUKE (50 MW)	None Reported	2-115 kV	None Reported	None Reported	1-230/115 kV 2-115 KV	None Reported	None Reported	None Reported	1-230/115 kV 4-115 KV
Cost	$0	$8,750,000	$0	$0	$12,715,000	$0	$0	$0	**$21,465,000**
SCRTP to FRCC (200 MW)	None Reported	1-500kV SVC* 2-230 kV 2-115 kV	None Reported	None Reported	1-230/115 kV 2-115 KV	None Reported	None Reported	None Reported	1-230/115 kV 2-230 kV 5-115 KV
Cost	$0	$115,750,000*	$0	$0	$12,715,000	$0	$0	$0	**$128,465,000**
LG&E/KU to Southern (200 MW)	None Reported	None Reported	None Reported	None Reported	None Reported	None Reported	None Reported	None Reported	None Reported
Cost	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
Southern to LG&E/KU (200 MW)	None Reported	None Reported	None Reported	None Reported	None Reported	None Reported	None Reported	None Reported	None Reported
Cost	$0	$0	$0	$0	$0	$0	$0	$0	**$0**

*Includes FRCC Projects

http://www.southeastirpp.com/

SERC LTSG 2017 SUMMER STUDY

VACAR Subregion Import Capability

NITC imports into VACAR exceed the tested levels for all imports.

The following table lists the FCITC limits for VACAR imports:

Transfer	Limiting Element (Owner)	Outaged Element	FCITC (MW)
Central to VACAR	Trimble County-Clifty Creek 345 kV (LG&E/KU/OVEC)	Rockport-Jefferson 765 kV	1500
Delta to VACAR	Trimble County-Clifty Creek 345 kV VACAR(LG&E/KU/OVEC)	Rockport-Jefferson 765 kV	2300
Gateway to VACAR	Pontiac-Brokaw 345 kV (CE/Ameren) & Kincaid-Pawnee 345 kV	Kincaid-Blue Mound 345 kV	2200
Southeastern to VACAR	West McIntosh-McIntosh 230 kV 2 (Southern)	West McIntosh-McIntosh 230 kV 1	1400

VACAR Subregion Export Capability

There were no NITC limits to report for any exports from VACAR.

The following table lists the FCITC limits for VACAR exports.

Transfer	Limiting Element (Owner)	Outaged Element	FCITC (MW)
VACAR to Central	West Point-Starkville SS 161 kV (TVA)	Clay 500/161 kV	2500
VACAR to Delta	None		3000
VACAR to Gateway	None		3000
VACAR to Southeastern	None		3000

Duke Import Capability

There were no NITC limits to report for any imports to Duke.

The following table lists the FCITC limits for Duke imports.

Transfer	Limiting Element (Owner)	Outaged Element	FCITC (MW)
Ameren	McGuire 500/230 kV (Duke)	Woodleaf-Pleasant Garden 500 kV	1800
DVP	Antioch 500/230 kV 2 (Duke)	Antioch 500/230 kV 1	1500
LG&E/KU	Trimble County-Clifty Creek 345 kV (LG&E/KU / OVEC)	Rockport-Jefferson 765 kV	450
SCEG	Camden-Camden Invista 115 kV	Camden-Camden Tap 115 kV	950
SCPSA	Camden-Camden Invista 115 kV	Camden-Camden Tap 115 kV	1200
Southern	SRS-Canadys 230 kV (SCEG)	McIntosh-Purrysburg 230 kV (Open McIntosh-Jasper Tap 115 kV)	1700

Duke Export Capability

There were no NITC limits to report for any exports from Duke.

The following table lists the FCITC limits for Duke exports.

Transfer	Limiting Element (Owner)	Outaged Element	FCITC (MW)
Ameren	Riverview-Peach Valley 230 kV 1/2	Riverview-Peach Valley 230 kV 2/1	2300
CP&LE	Woodleaf-Pleasant Garden 500 kV	Newport-Richmond 500 kV	1700
DVP	Clover 500/230 kV (DVP)	Wake-Carson 500 kV	1400
SCEG	SRS-Canadys 230 kV (SCEG)	Vogtle-West McIntosh 500 kV	800
SCPSA	SRS-Canadys 230 kV (SCEG)	Vogtle-West McIntosh 500 kV	700
TVA	West Point-Starkville SS 161 kV	Clay 500/161 kV	1200

PEC Import Capability

There were no NITC limits to report for any imports to CPLE.

The following table lists the FCITC limits for CPLE imports.

Transfer	Limiting Element (Owner)	Outaged Element	FCITC (MW)
DUKE	Woodleaf-Pleasant Garden 500 kV	Newport-Richmond 500 kV	1700
DVP	TCEMC Friendship Tap-Kornegay 115 kV	Clinton-Warsaw Tap 230 kV	1900
GTC	SRS-Canadys 230 kV (SCEG)	Vogtle-West McIntosh 500 kV	750
Southern	SRS-Canadys 230 kV (SCEG)	McIntosh-Purrysburg 230 kV (Open McIntosh-Jasper Tap 115 kV)	1100
TVA	SRS-Canadys 230 kV (SCEG)	McIntosh-Purrysburg 230 kV (Open McIntosh-Jasper Tap 115 kV)	1500

PEC Import Capability

There were no NITC limits to report for any imports to CPLW.

The following table lists the FCITC limits for CPLW imports.

Transfer	Limiting Element (Owner)	Outaged Element	FCITC (MW)
DUKE	None		800
CPLE	None		800
TVA	None		800

PEC Export Capability

There were no NITC limits to report for any exports from CPLE.

The following table lists the FCITC limits for CPLE exports.

Transfer	Limiting Element (Owner)	Outaged Element	FCITC (MW)
DVP	Clover 500/230 kV (DVP)	Wake-Carson 500 kV	1300
SCEG	West McIntosh-McIntosh 230 kV 2	West McIntosh-McIntosh 230 kV 1	950
TVA	West Point-Starkville SS 161 kV	Clay 500/161 kV	1200

No CPLW exports were tested.

Significant Facilities

Clover 500/230 kV (DVP)

Clover 500/230 kV transformer limits imports from CP&L-E and DUKE to DVP for the outage of Carson-Wake 500 kV line. DVP is planning to install a second 500/230 kV transformer at Clover substation by winter of 2012 to alleviate this limit.

Significant Facilities

Antioch 500/230 kV Transformers (DUKE)

Outage of either bank may limit DVP-DUKE transfers. The FCITC limit is high; however, Duke Energy will monitor the facility and evaluate corrective actions, if necessary.

McGuire 500/230 kV Transformer (DUKE)

For the outage of the Woodleaf-Pleasant Garden 500 kV line, the McGuire 500/230 kV bank may limit AMRN-DUKE transfers. The contingency's impact on the McGuire 500/230 kV transformer is directly related to the participation of McGuire Unit 1 in the transfer. As a result of the high FCITC level, Duke Energy has no plans for upgrades at this time.

Significant Facilities

McGuire - Riverbend Steam Station 230 kV 1/2 (DUKE)

These lines may become overloaded during CP&L-E-DUKE and TVA-DUKE transfers for outage of one of the parallel lines. Duke Energy plans to mitigate the issue through re-dispatching its generation at Lincoln CT Station.

Parkwood 500/230 kV Transformers (DUKE)

The outage of either parallel bank may limit DUKE-CP&L-E and DUKE-DVP transfers. An ancillary equipment upgrade can eliminate the lower transfer limits caused by limitations on bank 6. Future plans are to open the parallel bank for outage of either bank; however, Duke Energy continues to evaluate alternative future corrective actions.

Significant Facilities

Wateree - Great Falls 100 kV 1/2 (DUKE)

These lines may become overloaded during CP&L-E-DUKE, SC-DUKE, and SCEG-DUKE transfers for outage of one of the parallel lines. Duke Energy plans to mitigate the issue through opening the Wateree 115/100 kV tie with Progress Energy and re-dispatching its generation at Wateree if necessary.

PJM Generation

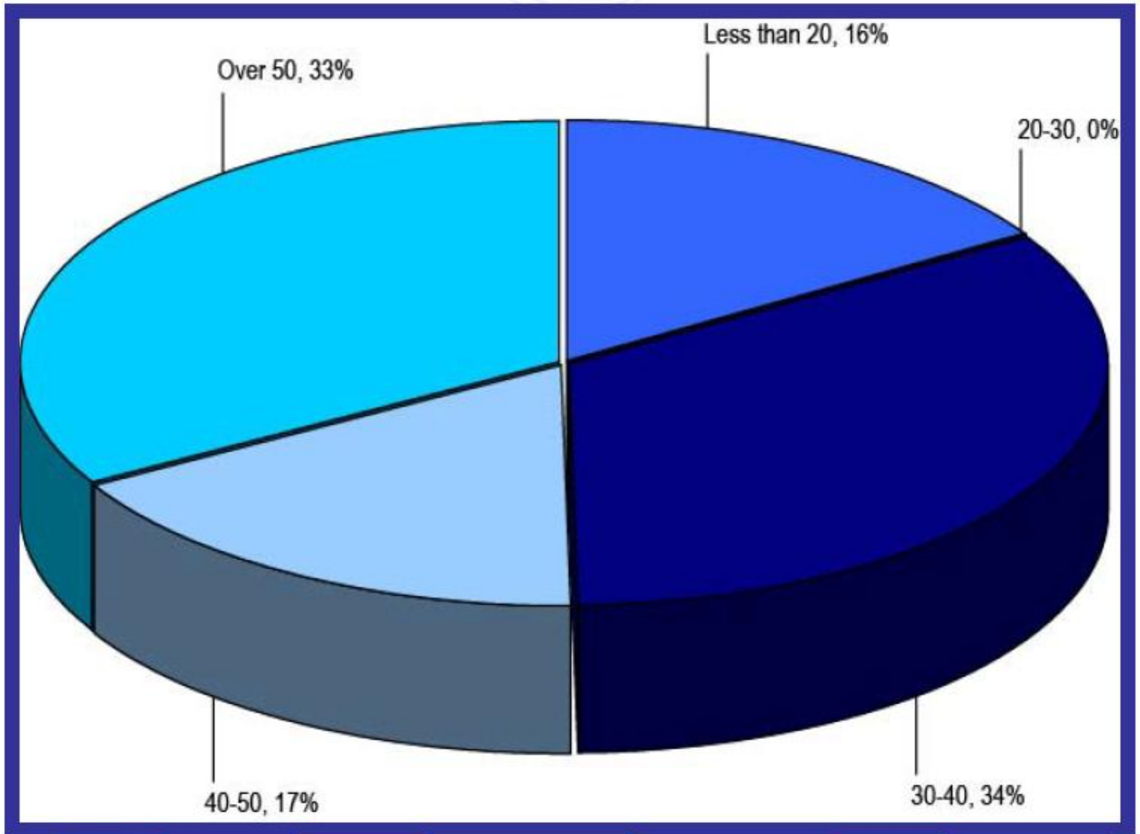
- PJM Interconnection Board approved nearly $2 billion in upgrades to maintain reliability based on the recently announced power plant retirements.

- Since November, generation owners in PJM have announced plans to retire nearly 14,000 megawatts (MW) of generation between May 2012 and the end of 2015

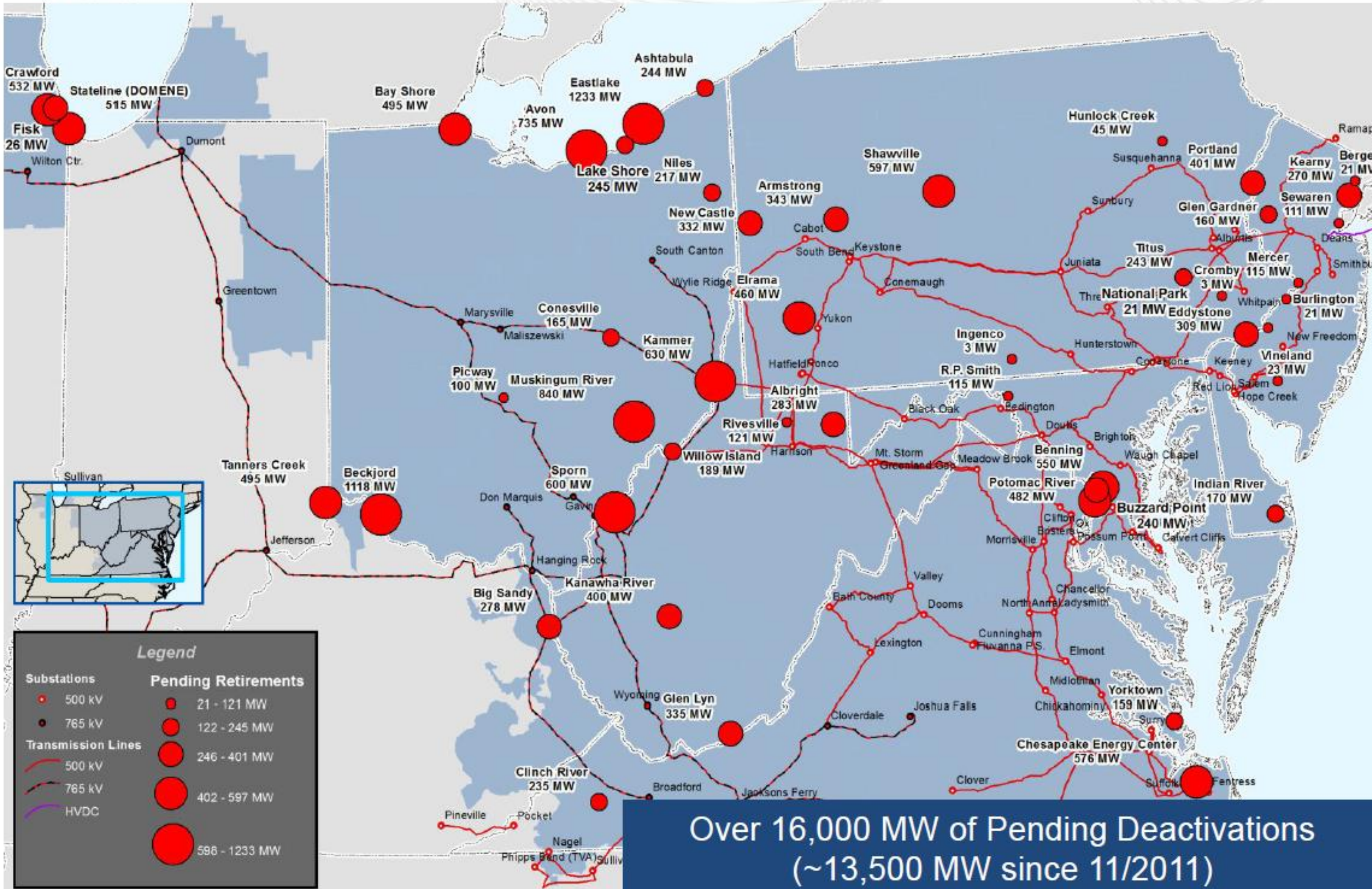
- Approved more than 130 transmission upgrades related to the generation retirements.

- Projects range from simple equipment replacements to new substations to rebuilding existing transmission lines and building new lines.

Generator Deactivations in Eastern Mid-Atlantic PJM (Unit Age, MW Percentage)

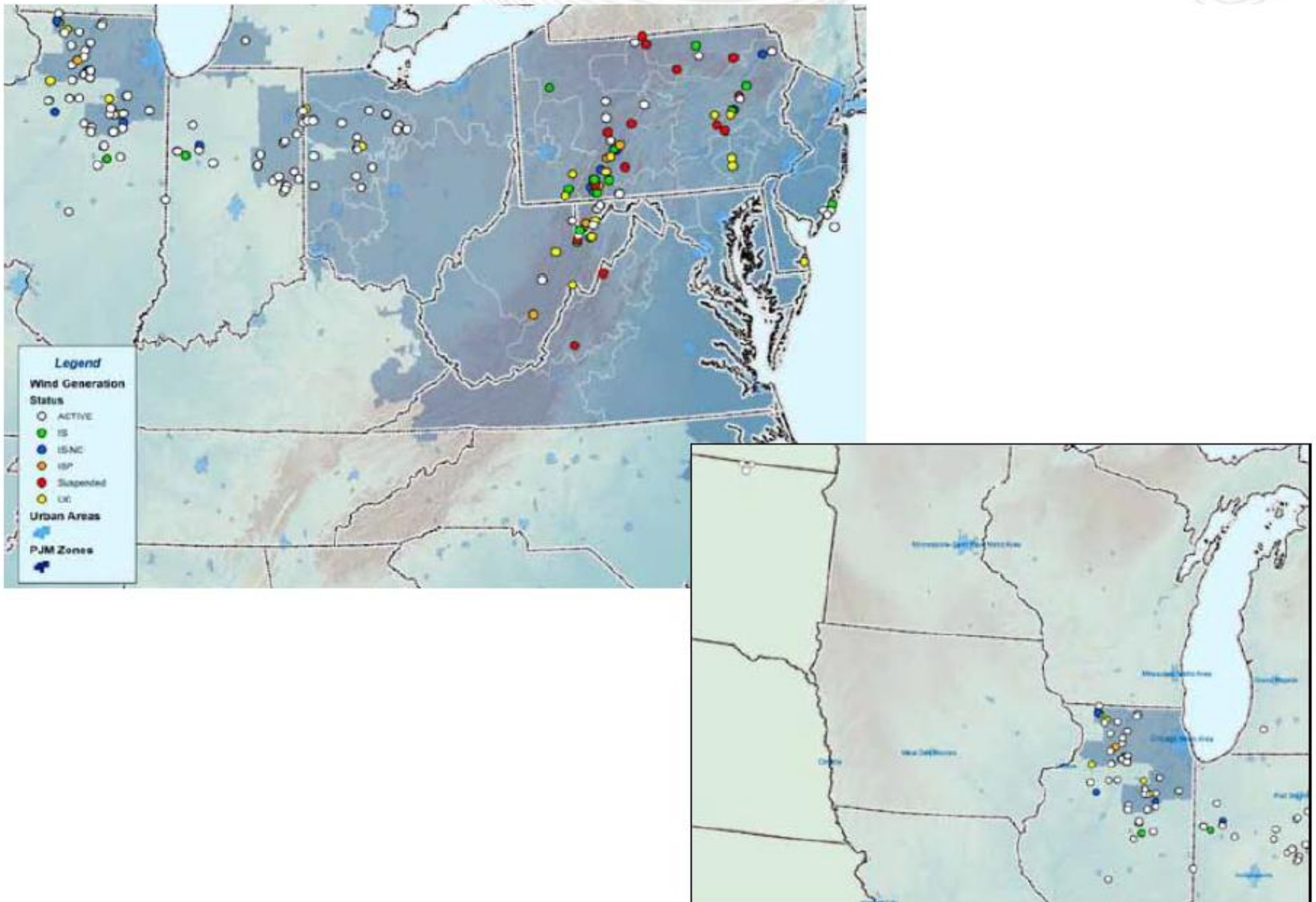


All Pending Generator Deactivations

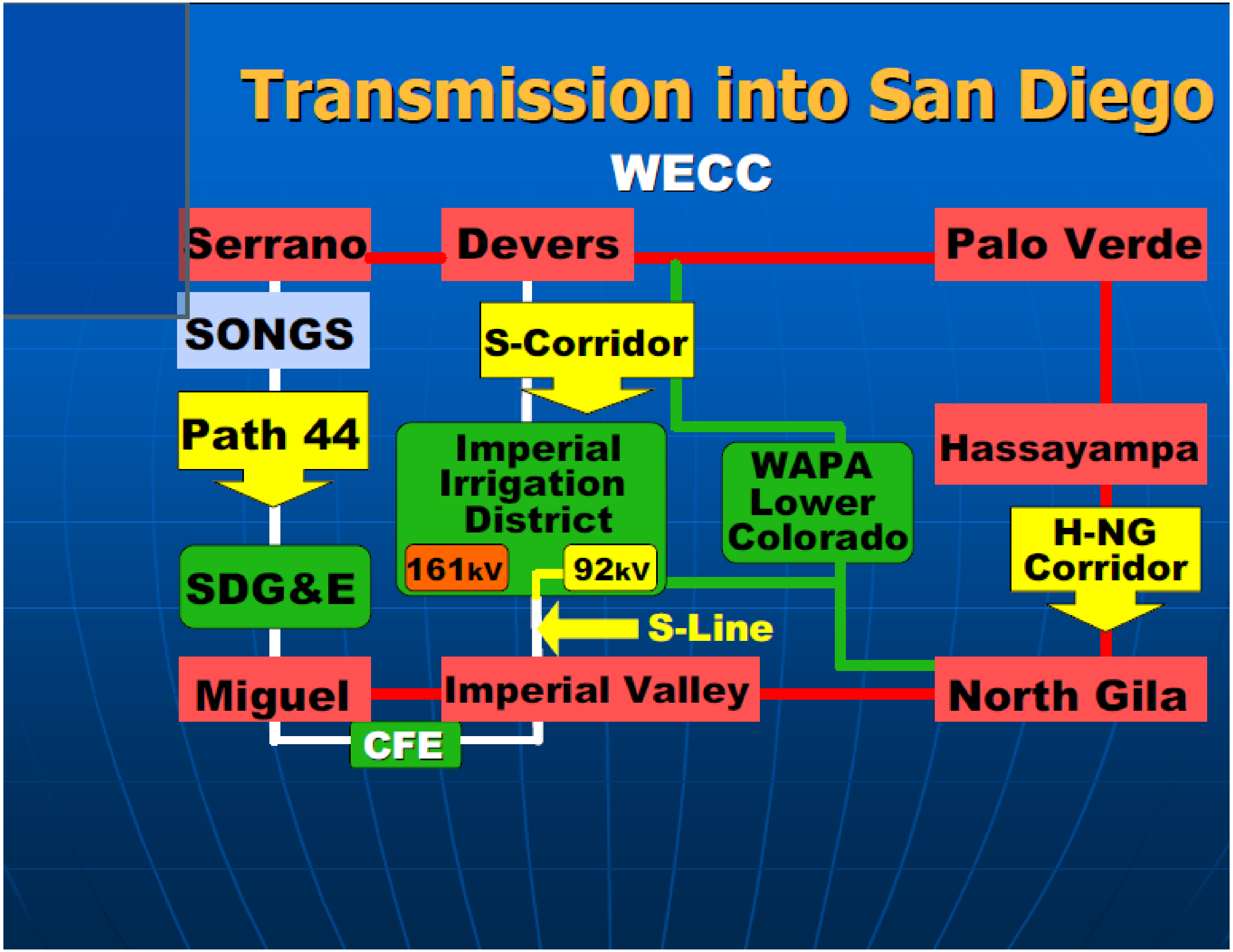


Over 16,000 MW of Pending Deactivations
(~13,500 MW since 11/2011)

Clustered Locations Wind-Powered Generation Projects in PJM



9/8/11 SoCal-Arizona Outage


Transmission into San Diego
WECC
Serrano
Devers
Palo Verde
SONGS
S-Corridor
Path 44
Imperial Irrigation District
161kV
92kV
WAPA Lower Colorado
Hassayampa
H-NG Corridor
SDG&E
S-Line
Miguel
Imperial Valley
North Gila
CFE

Blackout Area

Key Findings and Recommendations

Why Was System Not Operated in N-1 State?

- Inadequate Planning
- Inadequate Situational Awareness
- Conservative protection system settings

Key Findings and Recommendations

Why Was System Not Operated in N-1 State?

- Reliability impact of Remedial Action Schemes and Special Protection Systems
- Impact of sub-100 kV systems on BPS reliability

NERC Reliability Standards Update

- Footnote b and TPL-001-2 remand
- Order 754 Survey

Questions ?

2012 TAG Work Plan

Rich Wodyka
Independent Consultant

2012 NCTPC Overview Schedule

Reliability Planning Process

- Evaluate current reliability problems and transmission upgrade plans
- Perform analysis, identify problems, and develop solutions
- Review Reliability Study Results

Enhanced Access Planning Process

- *No requests were received for 2012*

Coordinated Plan Development

- Combine Reliability and Enhanced Results
- OSC publishes DRAFT Plan
- TAG review and comment

FERC Order 1000 Updates

TAG Meetings

1st Quarter | 2nd Quarter | 3rd Quarter | 4th Quarter

2012 TAG Work Plan

January – February

- **2012 Study – Finalize Study Scope of Work**
  - ✓ **Receive final 2012 Reliability Study Scope for comment**
  - ✓ **Review and provide comments to the OSC on the final 2012 Study Scope**
  - ✓ **Receive request from OSC to provide input on proposed Enhanced Transmission Access scenarios and interfaces for study**
  - ✓ **Provide input to the OSC on proposed Enhanced Transmission Access scenarios and interfaces for study -** ***No requests were received for 2012***

March

TAG Meeting

- **2012 Study Update**
  - ✓ **Receive a progress report on the Reliability Planning study activities**
- **Order 1000 Update**
  - ✓ **Receive report on the direction that the NCTPC is heading on the Order 1000 regional compliance**
  - ✓ **Receive an updated overall Compliance Timeline highlighting when continued stakeholder involvement in the process will occur**

April - May - June

- **2012 Study - Technical Analysis, Problem Identification, and Solution Development**
  - **TAG will be requested to provide input to the OSC and PWG on the technical analysis performed, the problems identified as well as proposing alternative solutions to the problems identified -- Delayed**
  - **TAG will be requested to provide input to the OSC and PWG on any proposed alternative solutions to the problems identified through the technical analysis -- Delayed**
- **Order 1000**
  - ✓ **NCTPC will release Draft #1 of regional compliance documents to TAG for comment**

June

TAG Meeting – Tuesday - June 19th

- **2012 Study Update**
  - ✓ **Receive a progress report on the Reliability Planning study activities and preliminary results**
- **Order 1000 Update**
  - ✓ **Receive an update on the Order 1000 regional compliance work**
  - ✓ **Receive an updated overall Compliance Timeline highlighting when continued stakeholder involvement in the process will occur**

July - August - September

- **2012 Study - Technical Analysis, Problem Identification, and Solution Development**
  - TAG will be requested to provide input to the OSC and PWG on the technical analysis performed, the problems identified as well as proposing alternative solutions to the problems identified
  - TAG will be requested to provide input to the OSC and PWG on any proposed alternative solutions to the problems identified through the technical analysis
- **2012 Study Update**
  - Receive a progress report on the Reliability Planning study activities and preliminary results
  - Receive update status of the upgrades in the 2011 Collaborative Plan

July – August - September

- **2012 Selection of Solutions**
  - TAG will receive feedback from the OSC on any alternative solutions that were proposed by TAG members
- **Order 1000 Update**
  - NCTPC will release Draft #2 of regional compliance documents to TAG for comment
  - Receive an updated overall Compliance Timeline highlighting when continued stakeholder involvement in the process will occur

July - August - September

TAG Meeting

- **2012 Study Update**
  - Receive a progress report on the Reliability Planning study activities and preliminary results
- **Order 1000 Update**
  - Receive an update on the Order 1000 regional compliance work and the changes that will be coming in Draft #2 of the regional compliance documents
  - Receive an updated overall Compliance Timeline highlighting when continued stakeholder involvement in the process will occur

October - November - December

- **2012 Study Update**
  - Receive and comment on final draft of the 2012 Collaborative Transmission Plan report

TAG Meeting

- **2012 Study Update**
  - Receive presentation on the draft report of 2012 Collaborative Transmission Plan

- **Order 1000 Update**
  - Receive update on the Order 1000 interregional compliance concepts and provide updated interregional Compliance Timeline highlighting when stakeholder involvement in the process will occur

Questions ?

TAG
Open Forum Discussion

Comments or Questions ?