Welcome

SERTP 2010 – 3rd Quarter Meeting

"2nd RPSG Meeting"

9:00 AM – 3:00 PM

2010 SERTP

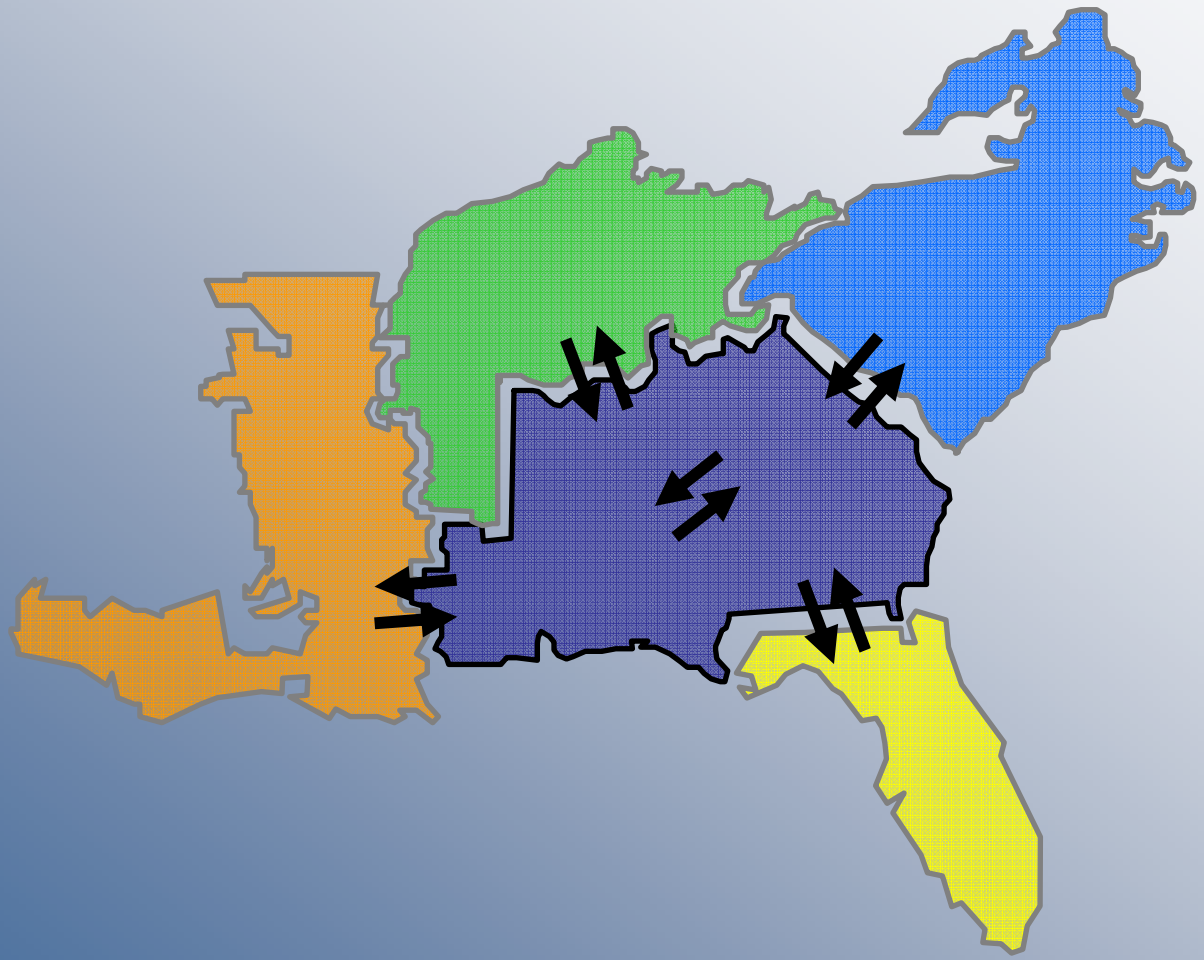
Purposes & Goals of the Meeting

- Preliminary Economic Planning Results
- SERC Regional Model Development Update
- FRCC Update
- 2009 – 2010 SIRPP Economic Study Results Update
- Feedback
- Next Meeting Activities

Southeastern Regional TRANSMISSION PLANNING

2010 SERTP

Economic Planning Studies



PowerSouth Energy Cooperative

Dalton Utilities

GeorgiaTransmission

MEAG POWER

South Mississippi Electric Power Association

Southern Company — Energy to Serve Your World℠

Southeastern Regional TRANSMISSION PLANNING

2010 SERTP

Five Economic Planning Studies

- Birmingham, AL to Georgia ITS
  - 1000 MW
- TVA Border to Southern Balancing Authority
  - 1500 MW
- SCPSA Border to Southern Balancing Authority
  - 200 MW
- Duke Border to Southern Balancing Authority
  - 2000 MW
- North Georgia to Mississippi
  - 600 MW

Power Flow Cases Utilized

- Study year: 2016
- Load Flow Cases:
  - 2010 Series Version 2C
    - Summer Peak
    - Shoulder

2010 SERTP

Five Economic Planning Studies

- Preliminary Report Components:
  - Thermal Analysis
    - Contingency Analysis to identify constrained elements/contingency pairs
  - Interface Transfer Capability Impacts
  - Potential Solutions
    - Transmission Enhancements and Cost Estimates

Southeastern Regional TRANSMISSION PLANNING

2010 SERTP

- The following information does not represent a commitment to proceed with the recommended enhancements nor implies that the recommended enhancements could be implemented by the study date of 2016.

- These potential solutions only address constraints identified within the Southern Balancing Area that are associated with the proposed transfers. Other Balancing Areas were not monitored which could result in additional limitations and required system enhancements.

Southeastern Regional
TRANSMISSION PLANNING

Birmingham, AL

to

Georgia ITS

1000 MW

Southeastern Regional TRANSMISSION PLANNING

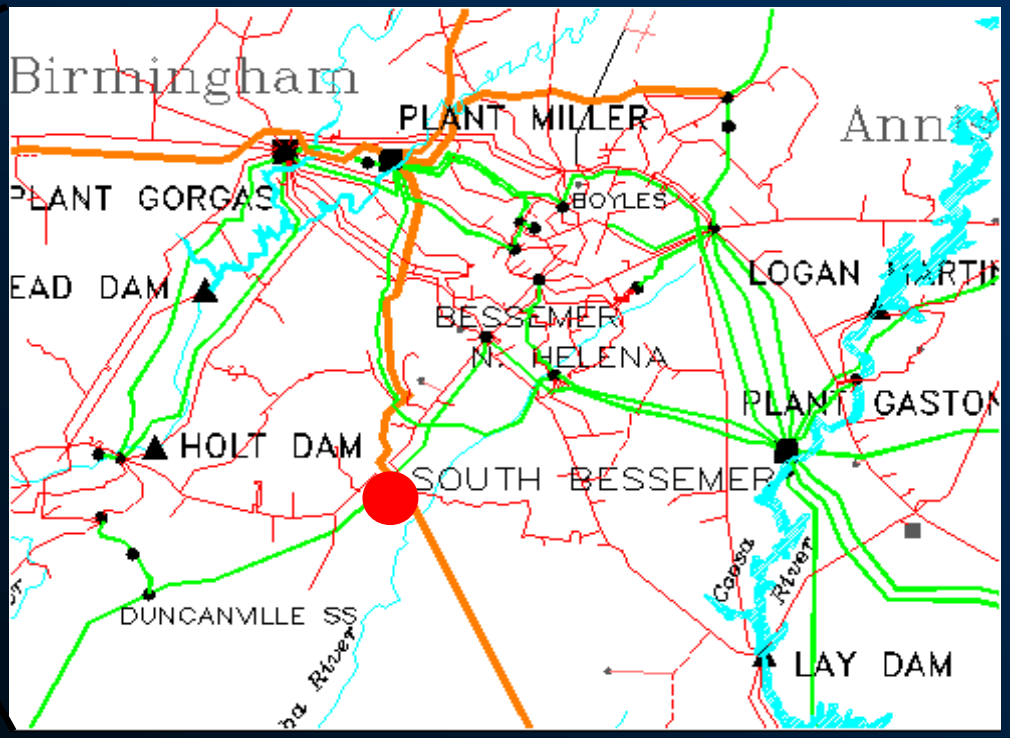
Birmingham, AL to Georgia ITS 1000 MW

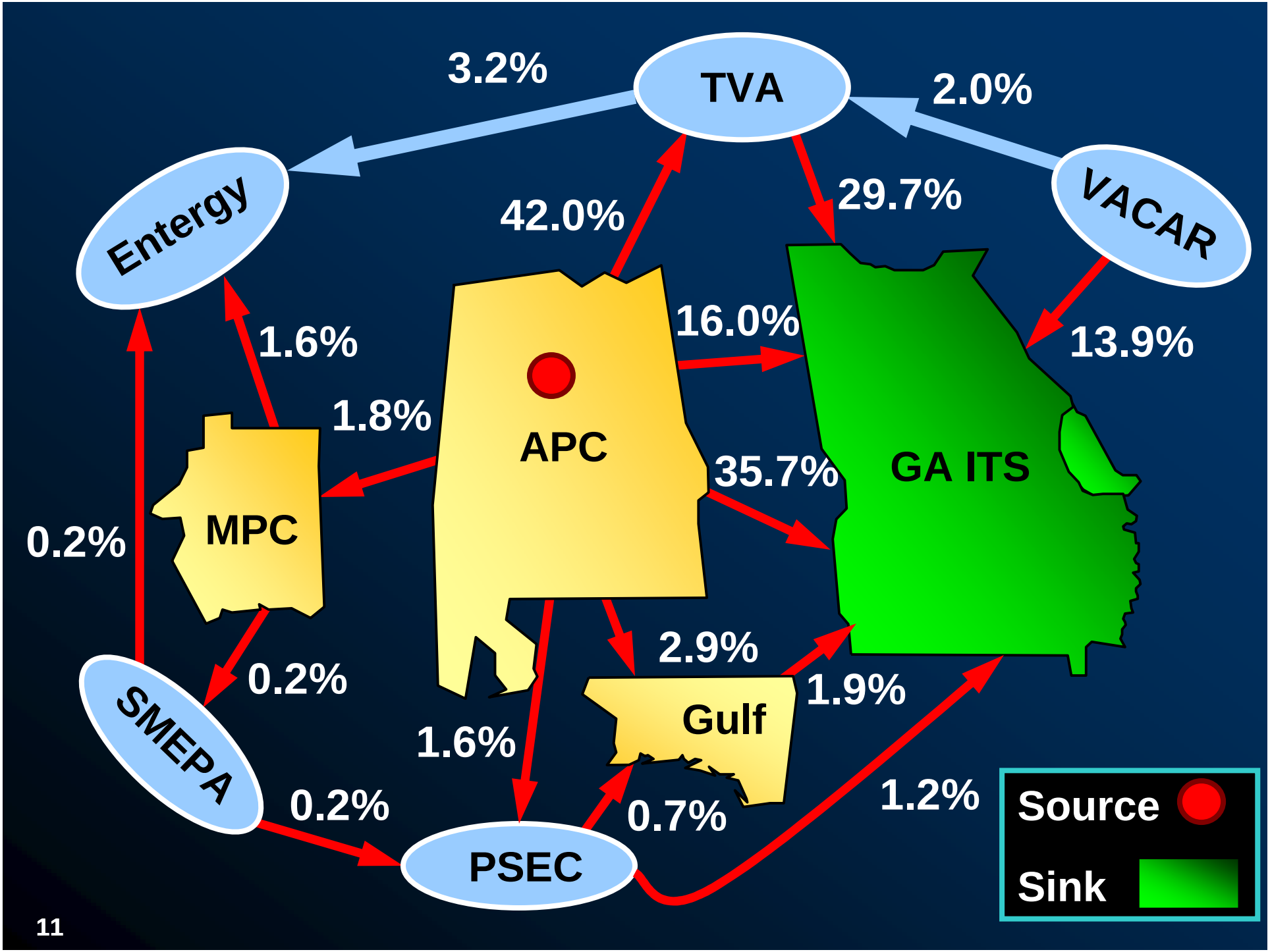
- Transfer Type: Generation to Generation
- Source: South Bessemer 500 kV
- Sink: Generation within the Georgia ITS

Southeastern Regional TRANSMISSION PLANNING

Birmingham, AL to Georgia ITS 1000 MW

- Transfer Type: Generation to Generation
- Source: South Bessemer 500 kV
- Sink: Generation within the Georgia ITS




TVA
Entergy
VACAR
APC
MPC
GA ITS
SMEPA
Gulf
PSEC
3.2%
2.0%
42.0%
29.7%
1.6%
16.0%
13.9%
1.8%
35.7%
0.2%
2.9%
0.2%
1.9%
1.6%
0.2%
0.7%
1.2%
Source
Sink

Birmingham, AL to Georgia ITS 1000 MW

Transmission System Impacts

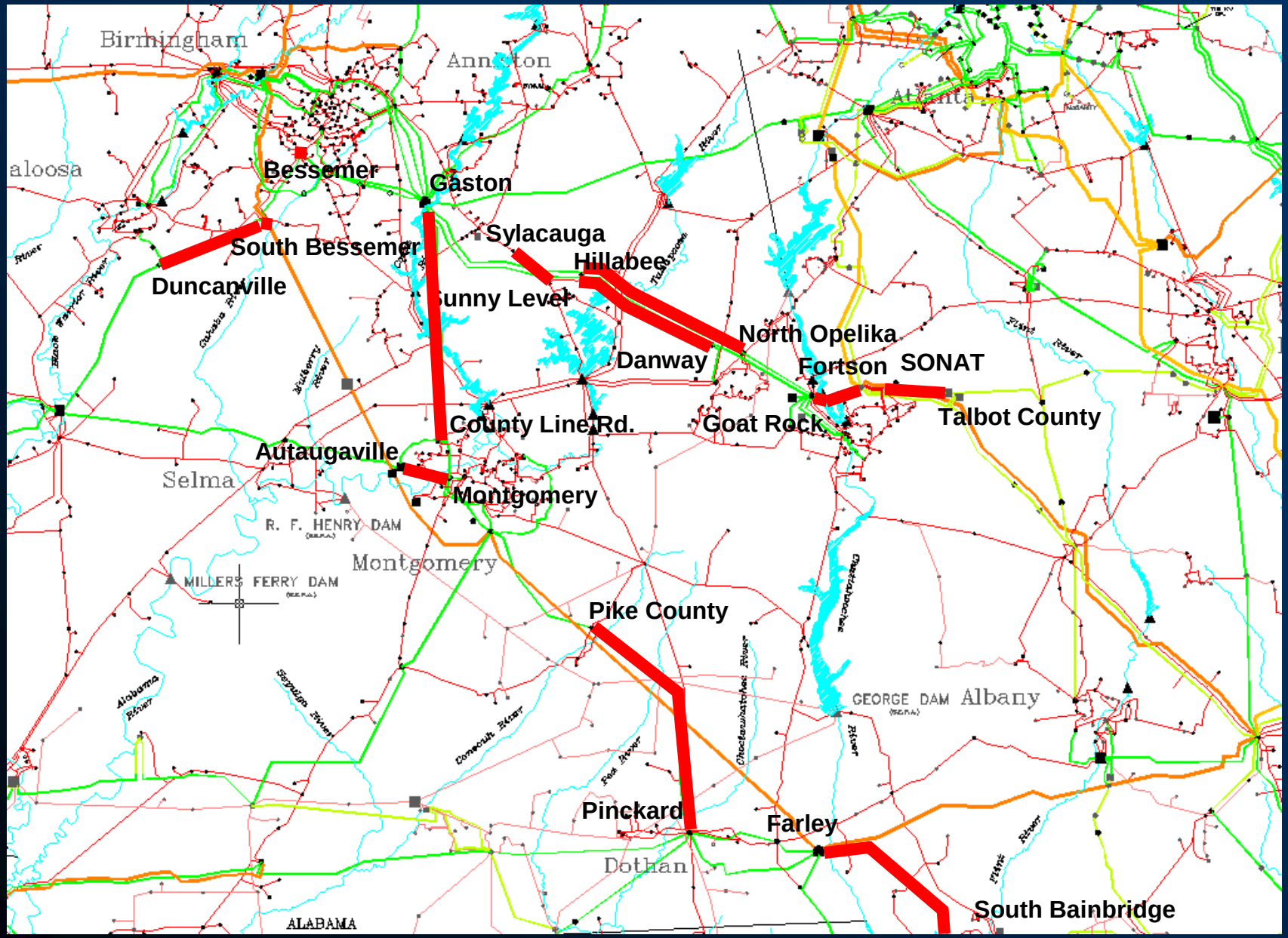
- Thermal Constraints Identified:
  - Ten (10) 230 kV Lines
  - Four (4) 230 / 115 kV Transformers
  - Fourteen (14) 115 kV Lines

Birmingham, AL to Georgia ITS 1000 MW

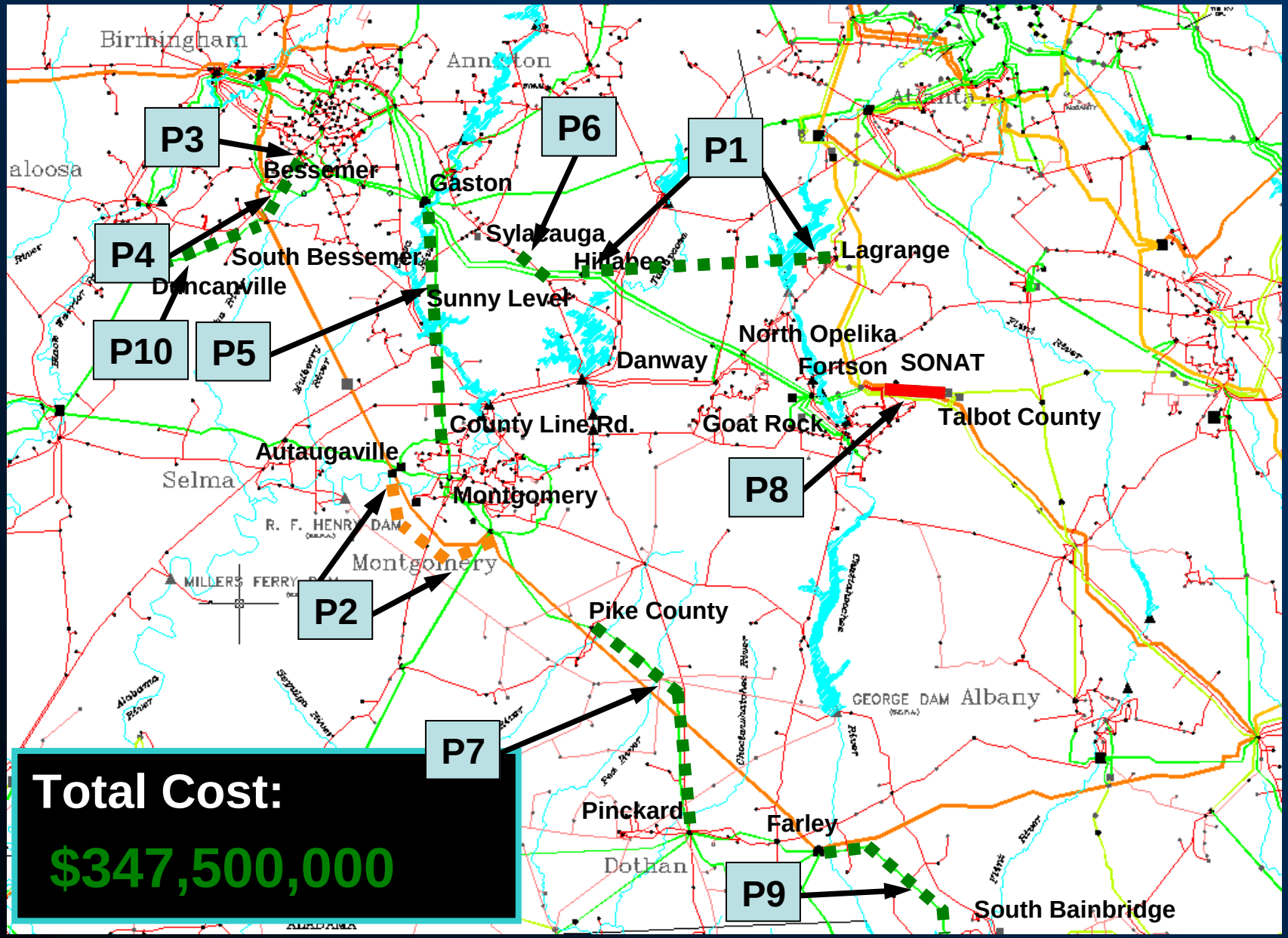
Significant Constraints – PASS 0

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
Bessemer 230/115 kV XFMR	392	89.1	110.2
Montgomery – Autaugaville 230 kV TL	1243	98.2	109.8
Fortson – Goat Rock 230 kV TL	1192	99.3	107.1
Danway – Hillabee 230 kV TL	602	94.2	104.7
South Bainbridge – Farley 230 kV TL	693	95.5	104.1
North Opelika – Hillabee 230 kV TL	602	91.1	101.6
Goat Rock – Camp McKenzie 230 kV TL	1204	93.5	100.8
North Selma 230/115 kV XFMR	302	96.3	100.5
Pinckard – Pike County 230 kV TL	478	87.6	100.3
Fortson – Camp McKenzie 230 kV TL	1192	92.8	100.2
South Bessemer 230/115 kV XFMR	480	86.2	100.0

Overloaded Elements



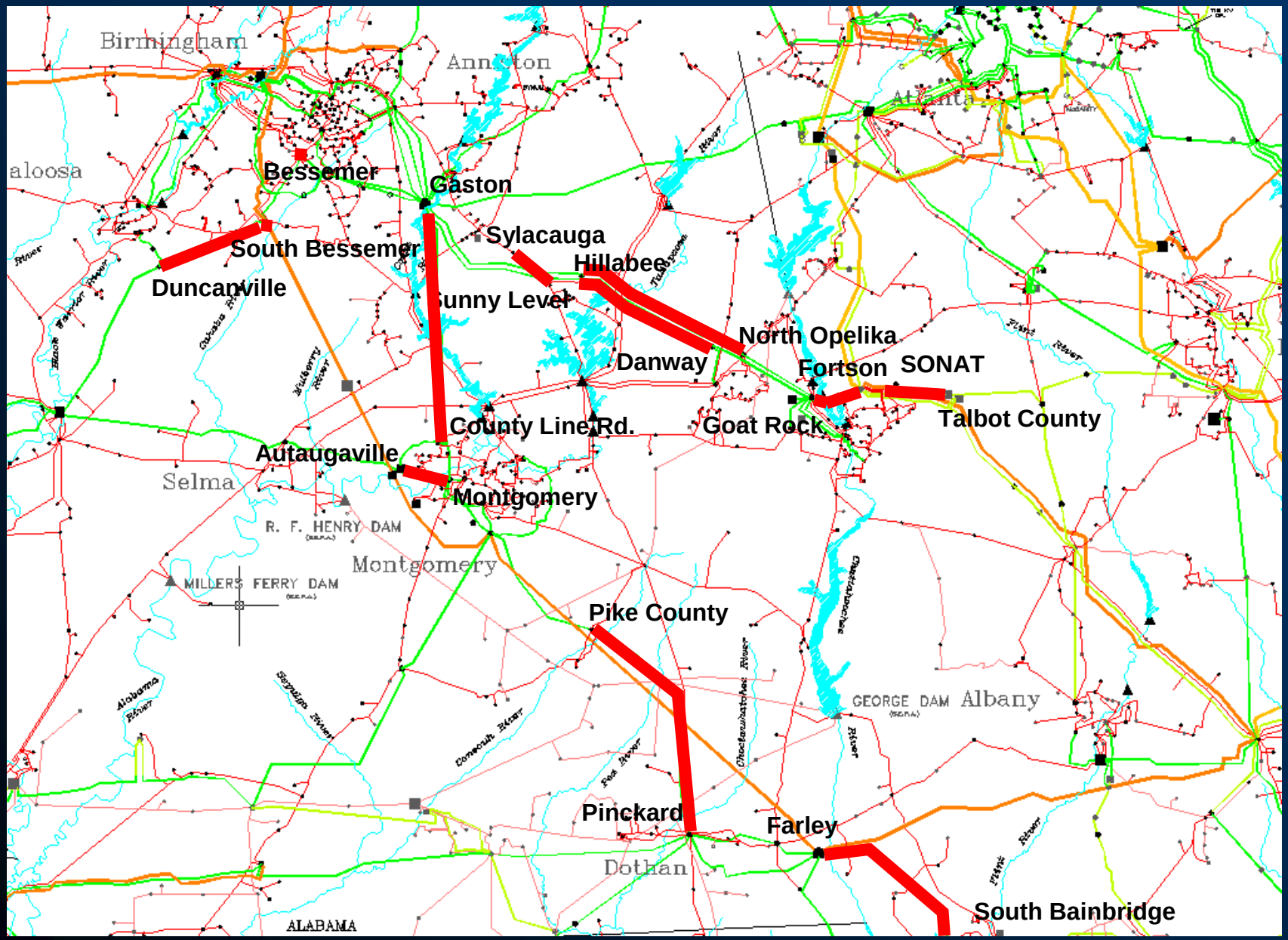
Potential Enhancements - Option 1



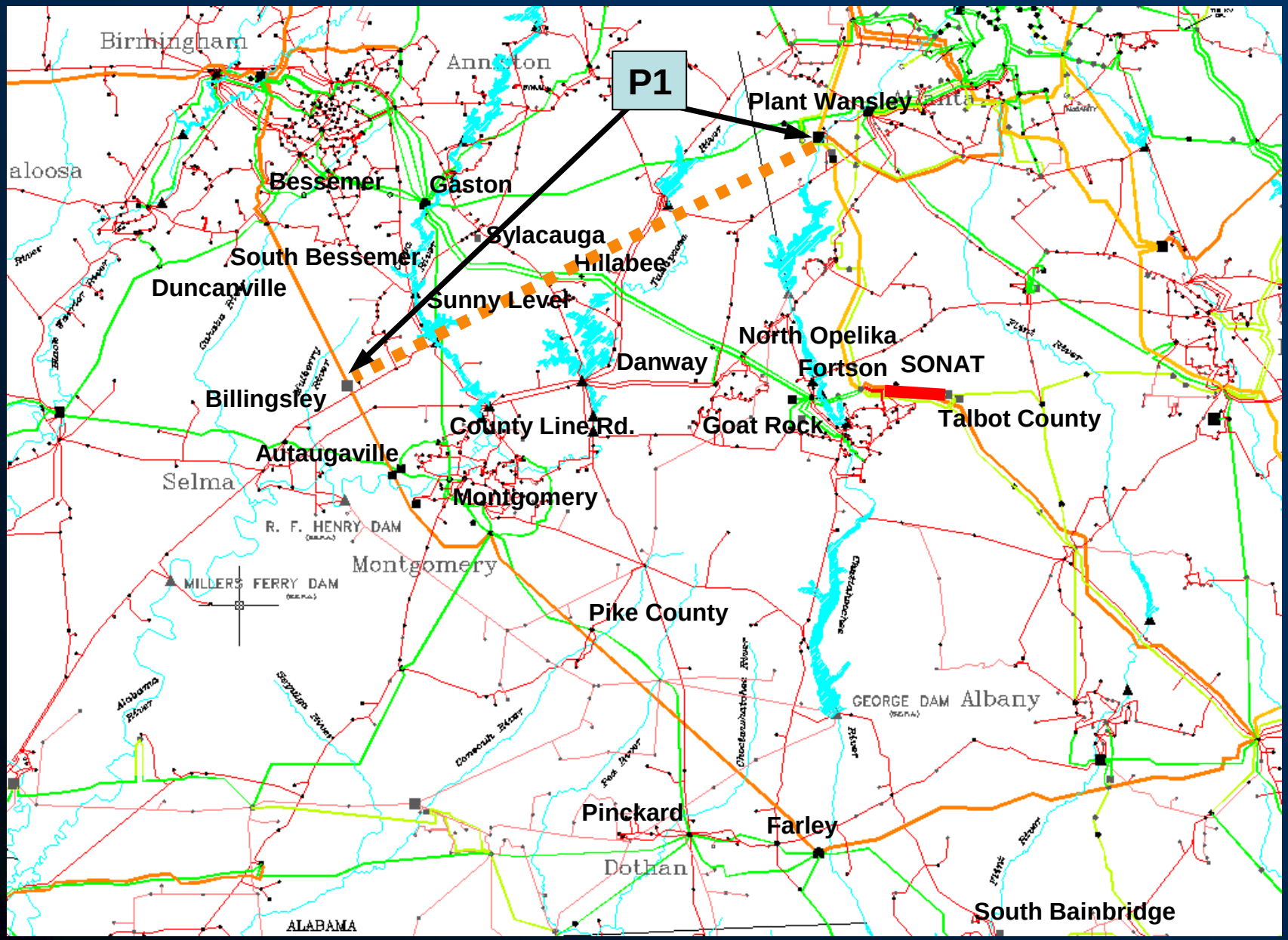
Total Cost:

$347,500,000

Overloaded Elements



Potential Enhancements - Option 2

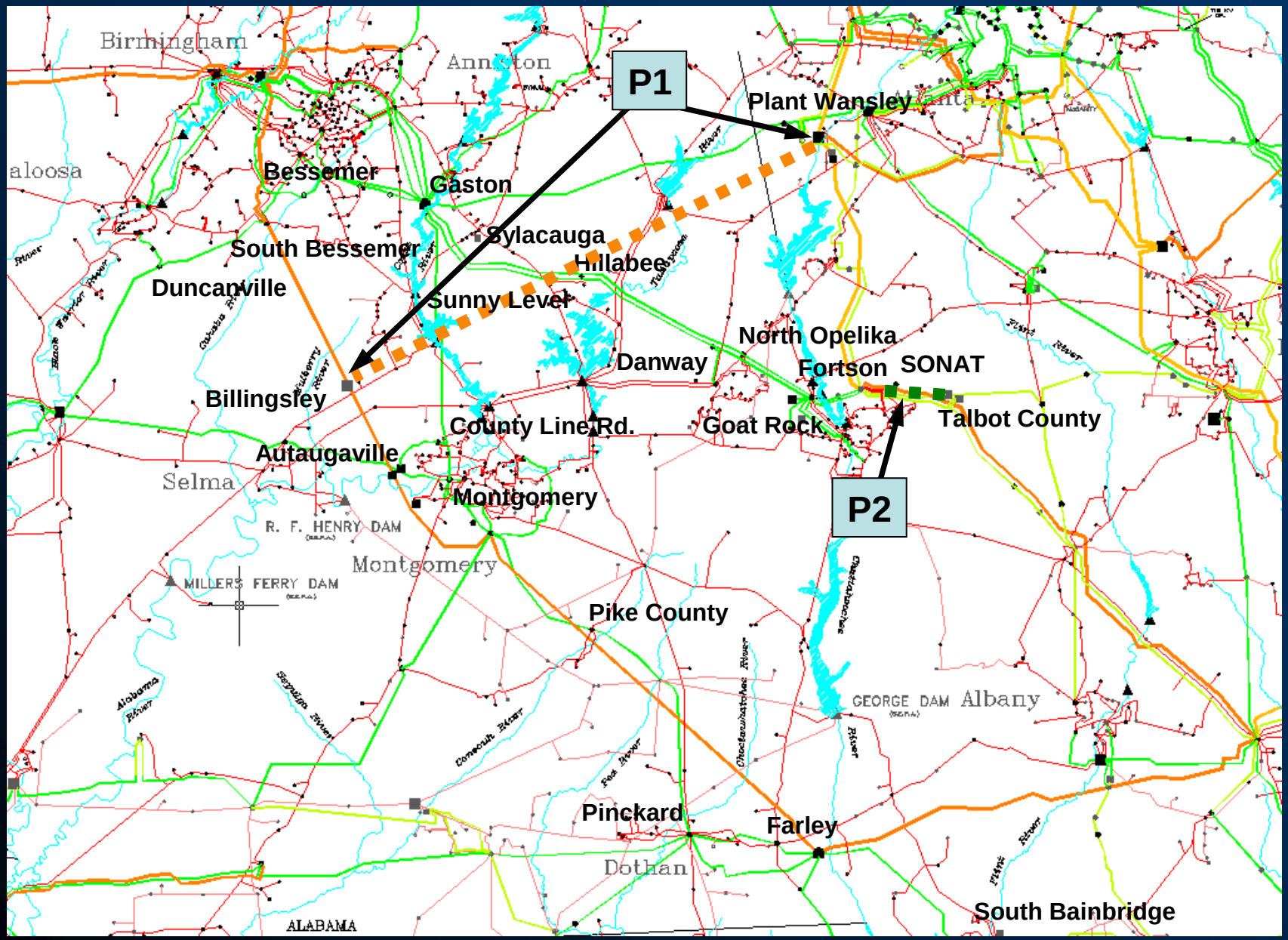


Birmingham, AL to Georgia ITS 1000 MW

Significant Constraints – PASS 1

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
Southern Natural Gas Tap – Talbot 230 kV TL	433	95.1	104.7

Potential Enhancements - Option 2



Southeastern Regional TRANSMISSION PLANNING

Birmingham, AL to Georgia ITS 1000 MW

Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	Billingsley – Wansley 500 kV TL	$286,000,000
P2	Waynesboro 230/115 kV XFMR	$6,300,000
P3	Jackson Lake – South Covington 115 kV TL	$1,100,000
P4	Gulf State Steel – Morgans Crossroads 115 kV TL	$500,000
P5	Southern Natural Gas – Talbot 230 kV TL	$7,500,000
P6	Halla Climate Control – GKN Westland Aerospace 115 kV TL	$1,100,000
P7	Willingham Drive – East Point 115 kV TL	$2,400,000
P8	Bent Brook – Airport Lane 115 kV TL	$300,000

Total Cost (2016$) = $305,200,000

Additional Study Aspects

- Estimate of transfer level that could result in an angular instability event
  - Requires greater than 1000 MW at South Bessemer
  - Currently, identifying transfer levels with and without thermal fixes

Questions on the Birmingham, AL to Georgia ITS Transfer?

TVA Border

to

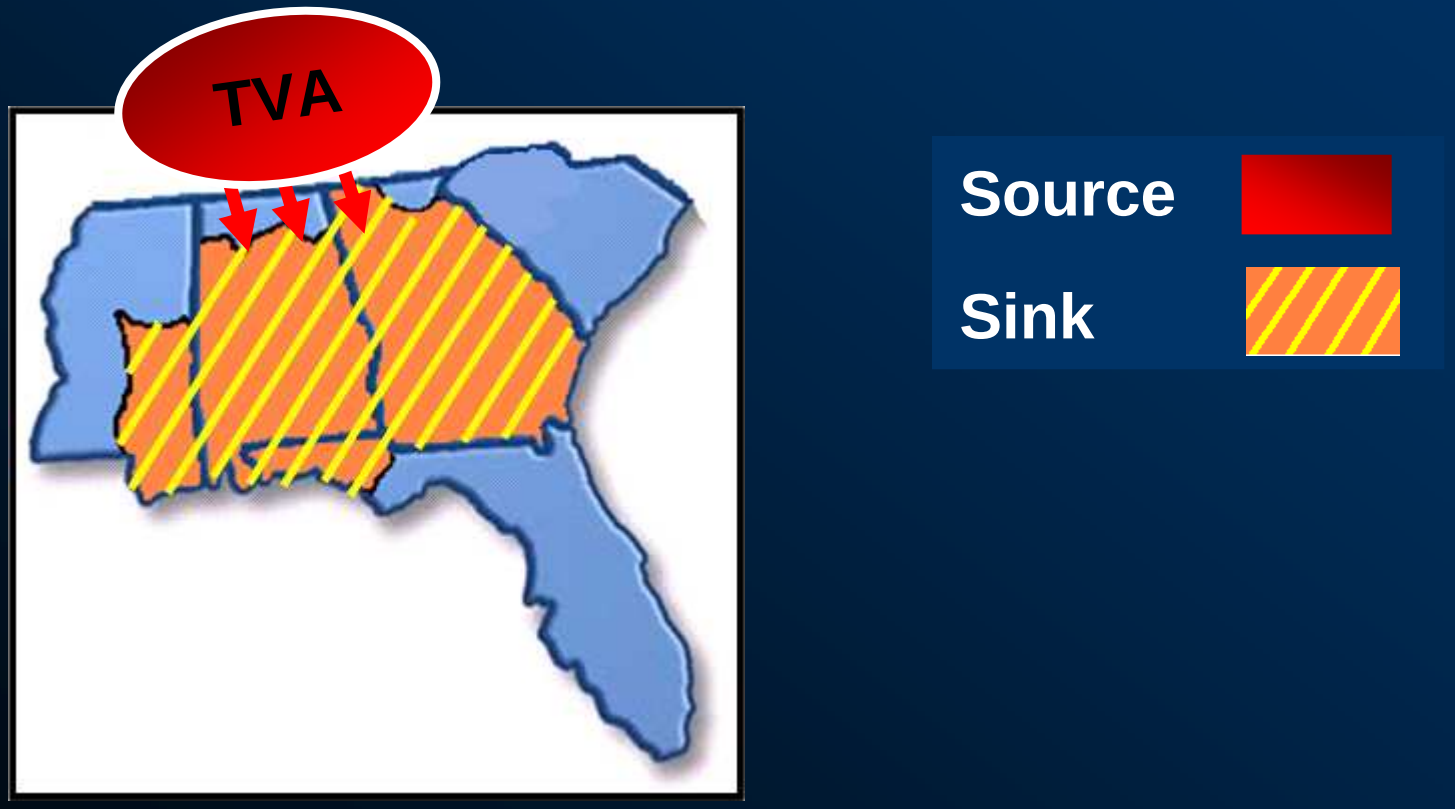
SBA

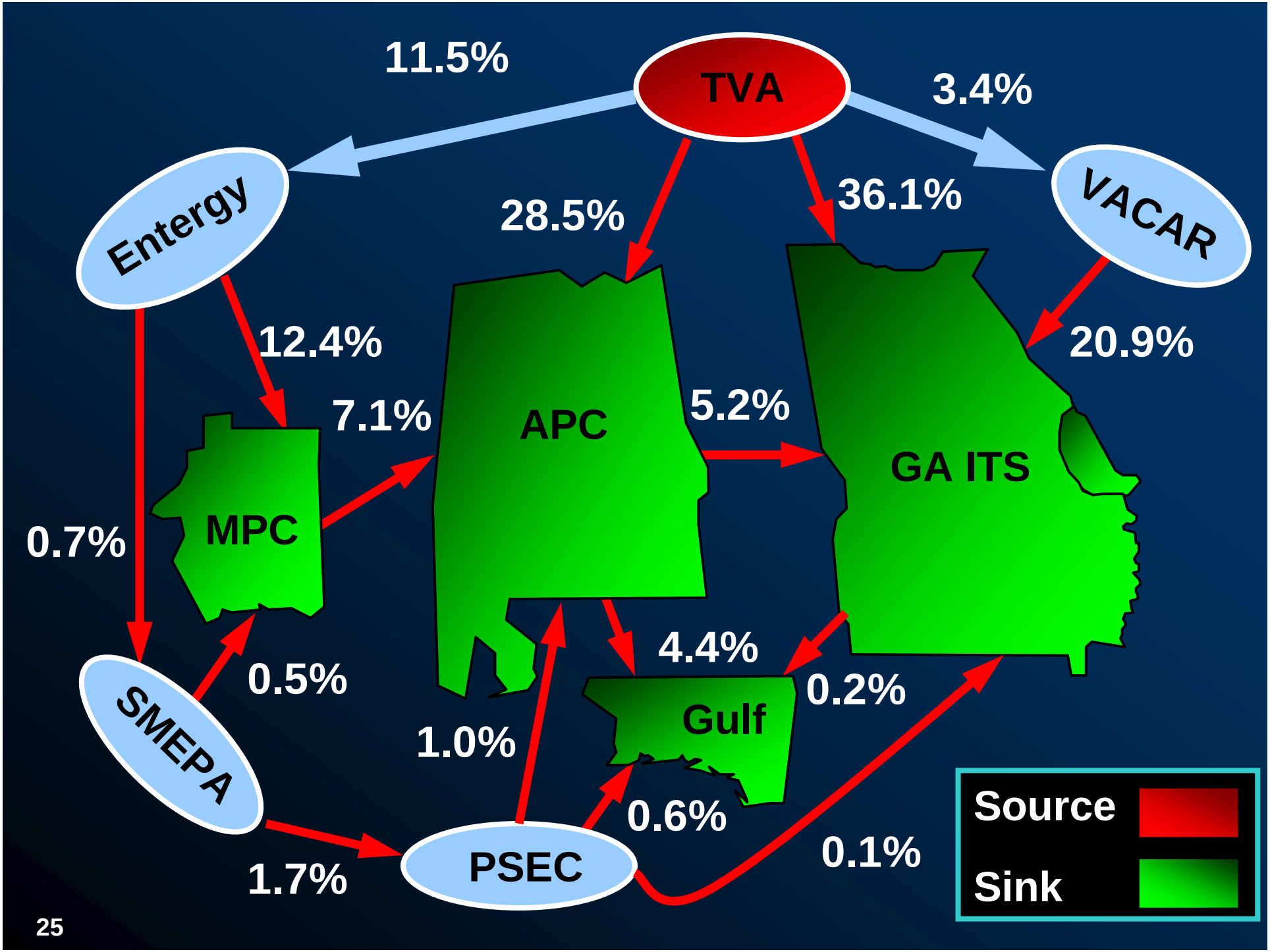
1500 MW

Southeastern Regional TRANSMISSION PLANNING

TVA Border to SBA 1500 MW

- Transfer Type: Load to Generation
- Source: Uniform Load Reduction in TVA
- Sink: Generation within the SBA




11.5%
TVA
3.4%
Entergy
28.5%
36.1%
VACAR
12.4%
20.9%
7.1%
APC
5.2%
GA ITS
MPC
0.7%
4.4%
0.5%
0.2%
Gulf
SMEPA
1.0%
0.6%
PSEC
1.7%
0.1%
Source
Sink

Southeastern Regional TRANSMISSION PLANNING

TVA Border to SBA 1500 MW

Transmission System Impacts

- Thermal Constraints Identified:
  - One (1) 500 kV Line(1)
  - Seven (7) 230 kV Lines
  - Two (2) 161 / 115 kV Line
  - One (1) 161 kV Line
  - Seven (7) 115 kV Lines

(1) The limiting element is within TVA

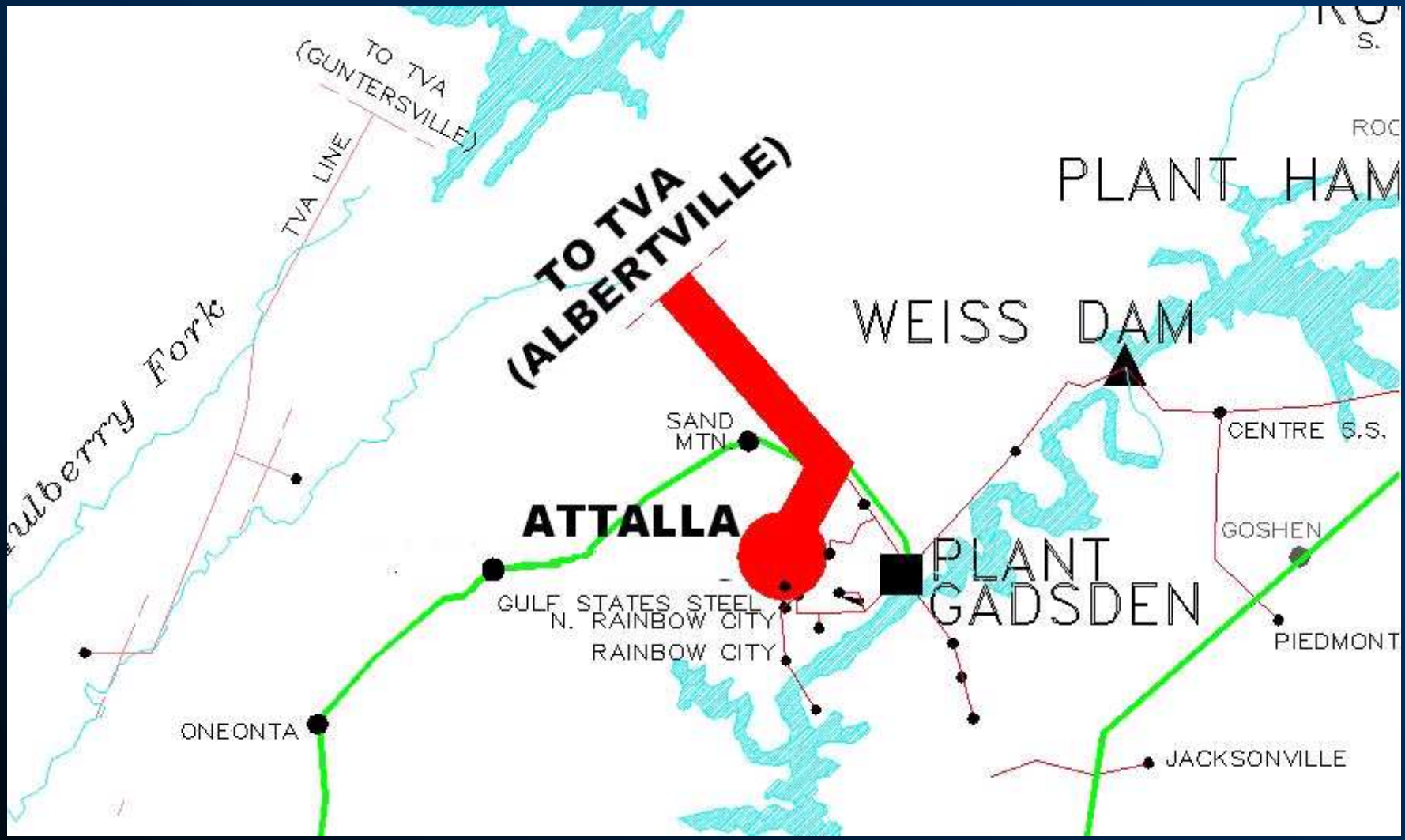
Southeastern Regional TRANSMISSION PLANNING

TVA Border to SBA 1500 MW

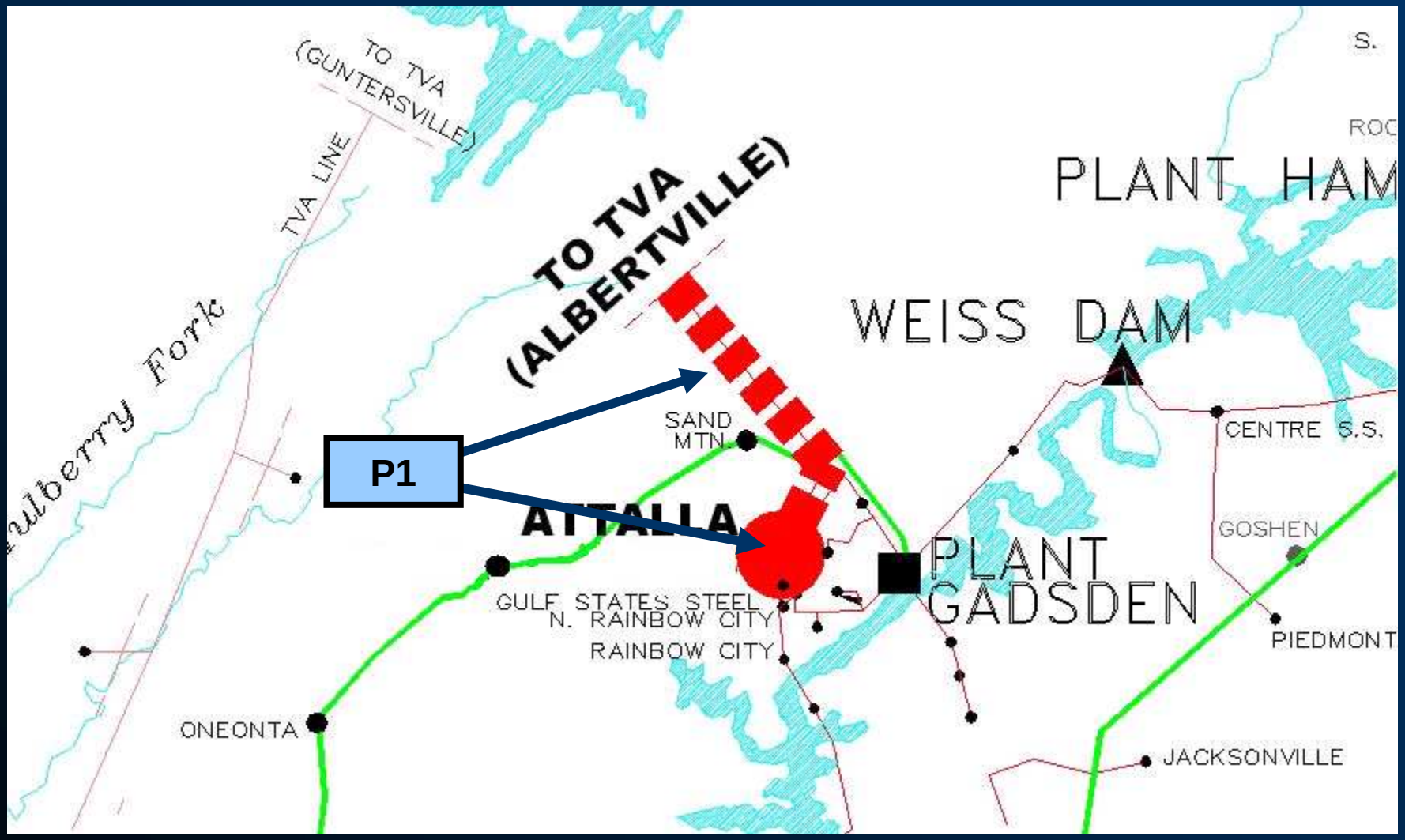
Significant Constraints – PASS 0

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
Attalla – Albertville 161 kV TL	193	82.7	124.8
Attalla 161 / 115 kV XFMR CKT 1	99	63	121.2
Attalla 161 / 115 kV XFMR CKT 2	111	75.5	114.0
Russell – Lexington 230 kV TL	596	94.9	108.9
South Hall – Candler 230 kV TL	509	91.4	102.7
Hillabee – Danway SS 230 kV TL	602	99.4	105.4
Hillabee – North Opelika 230 kV TL	602	96.3	102.2

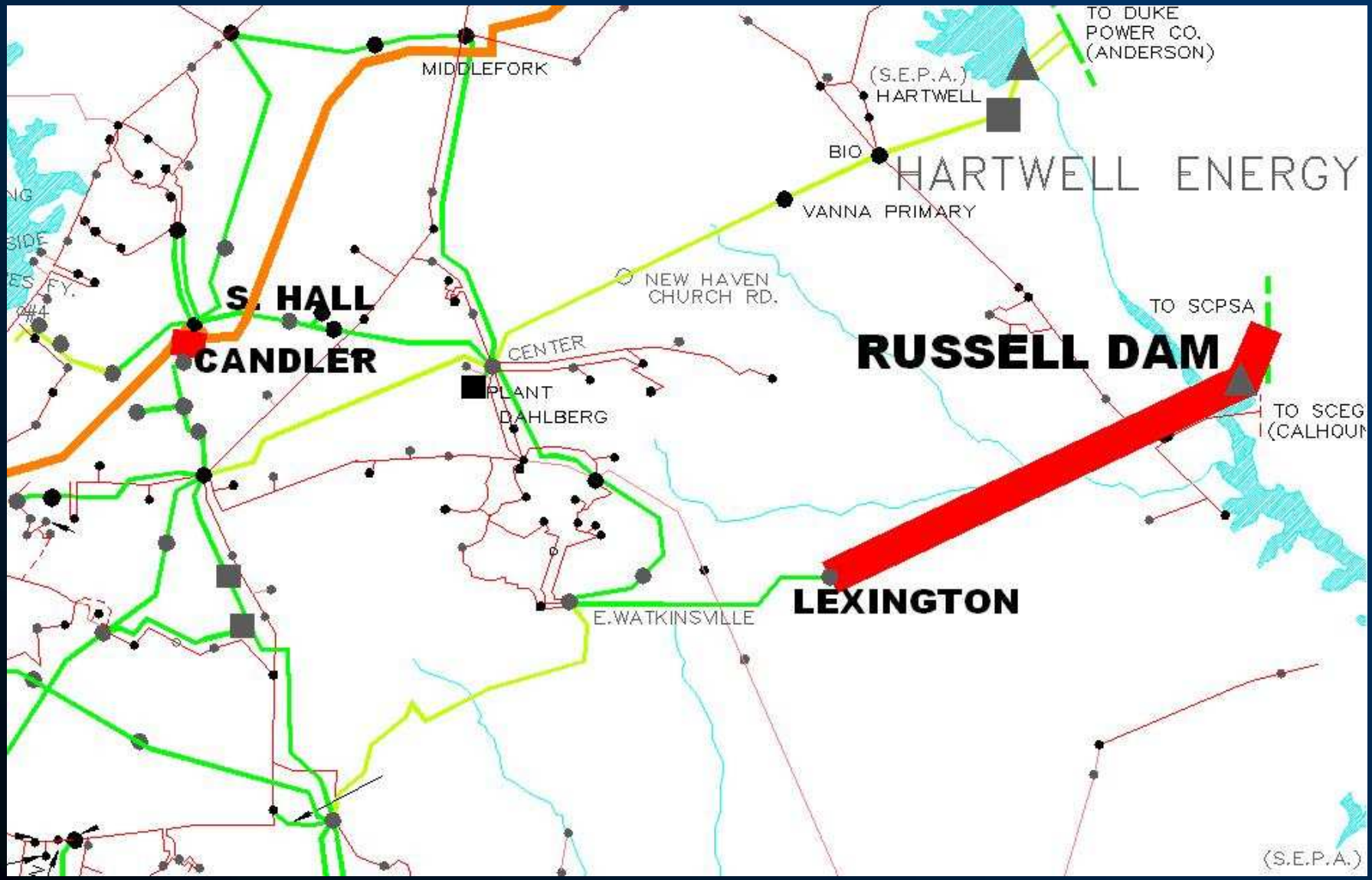
Overloaded Elements



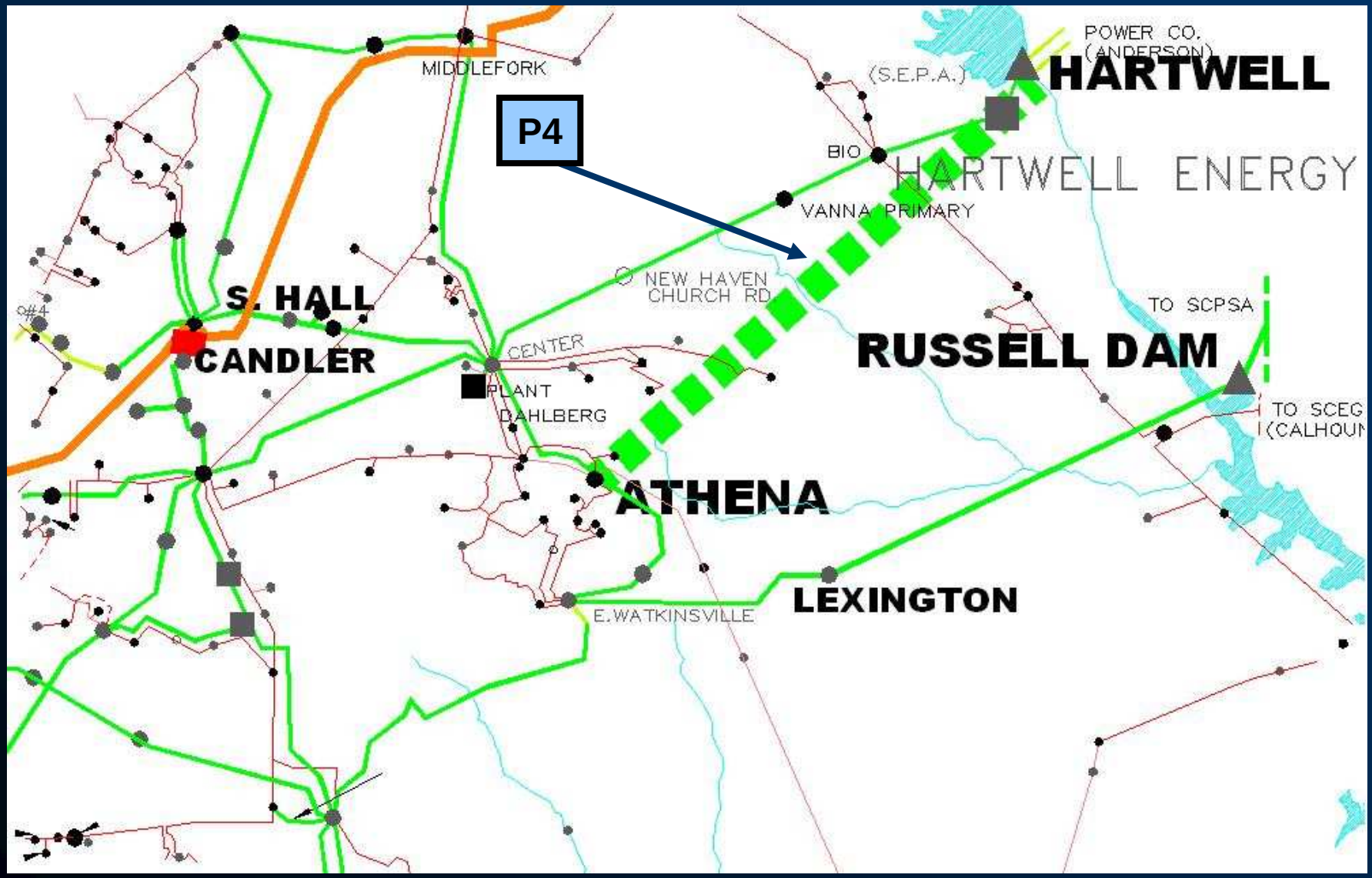
Potential Enhancements



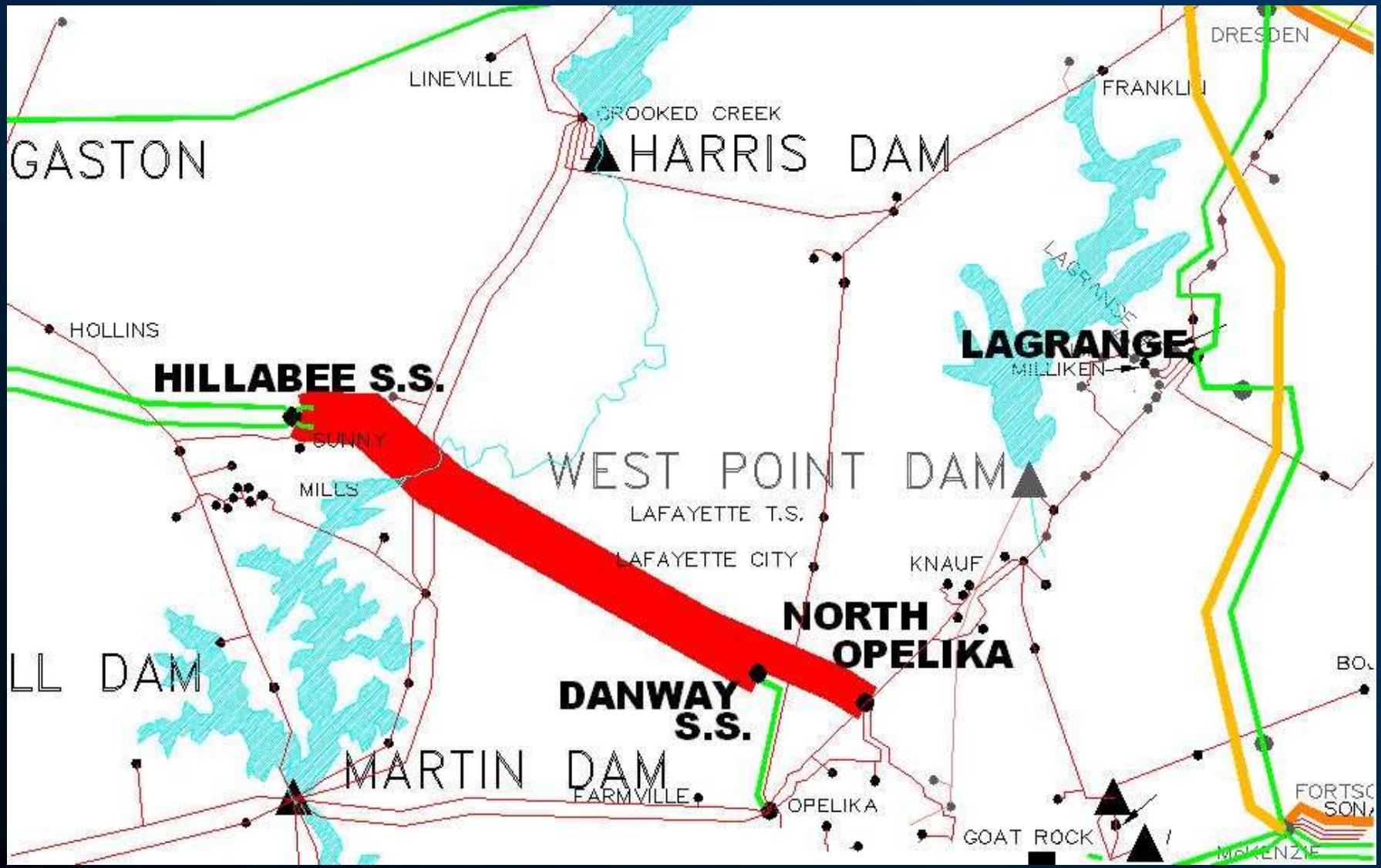
Overloaded Elements



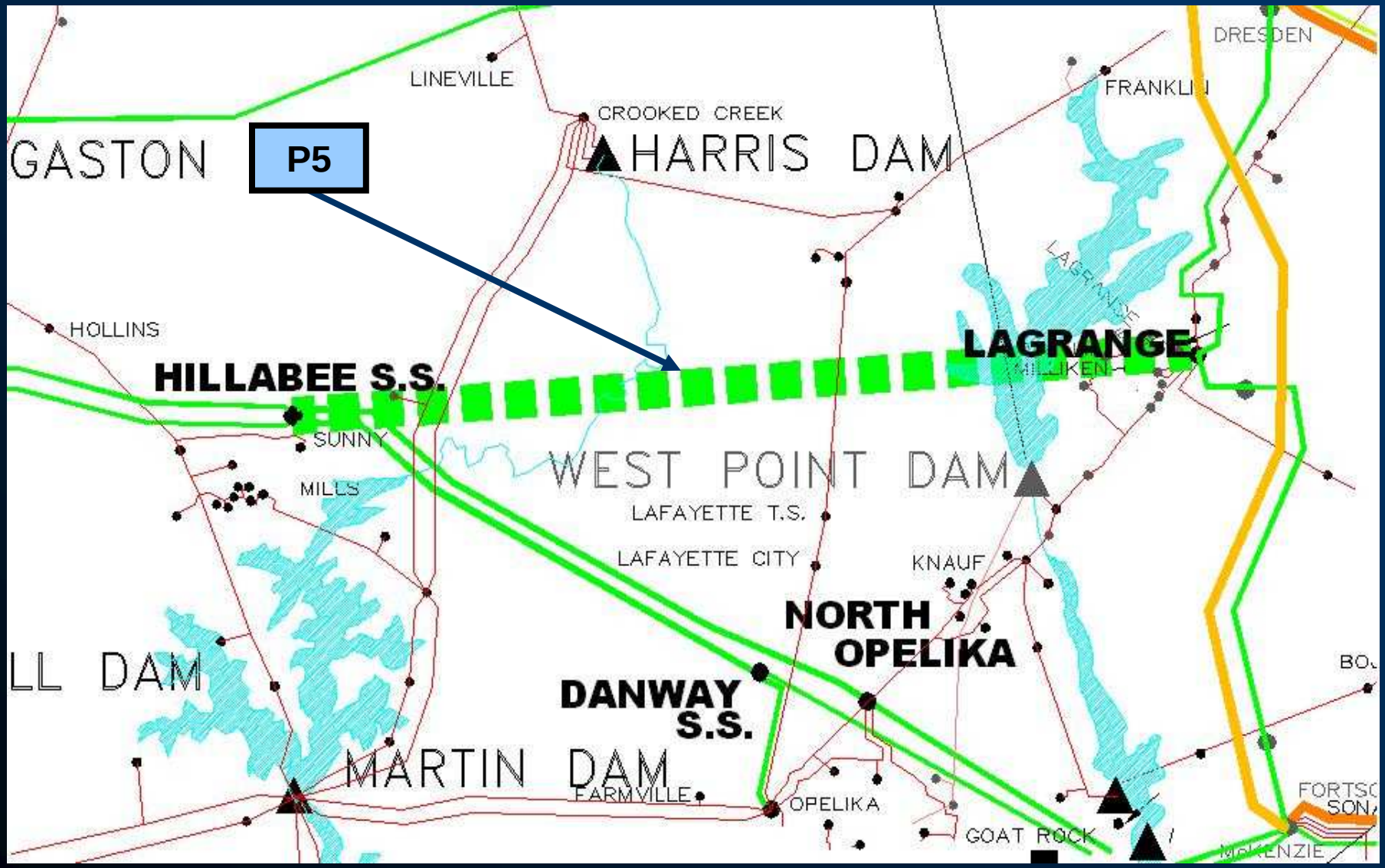
Potential Enhancements



Overloaded Elements



Overloaded Elements



Southeastern Regional TRANSMISSION PLANNING

TVA Border to SBA 1500 MW

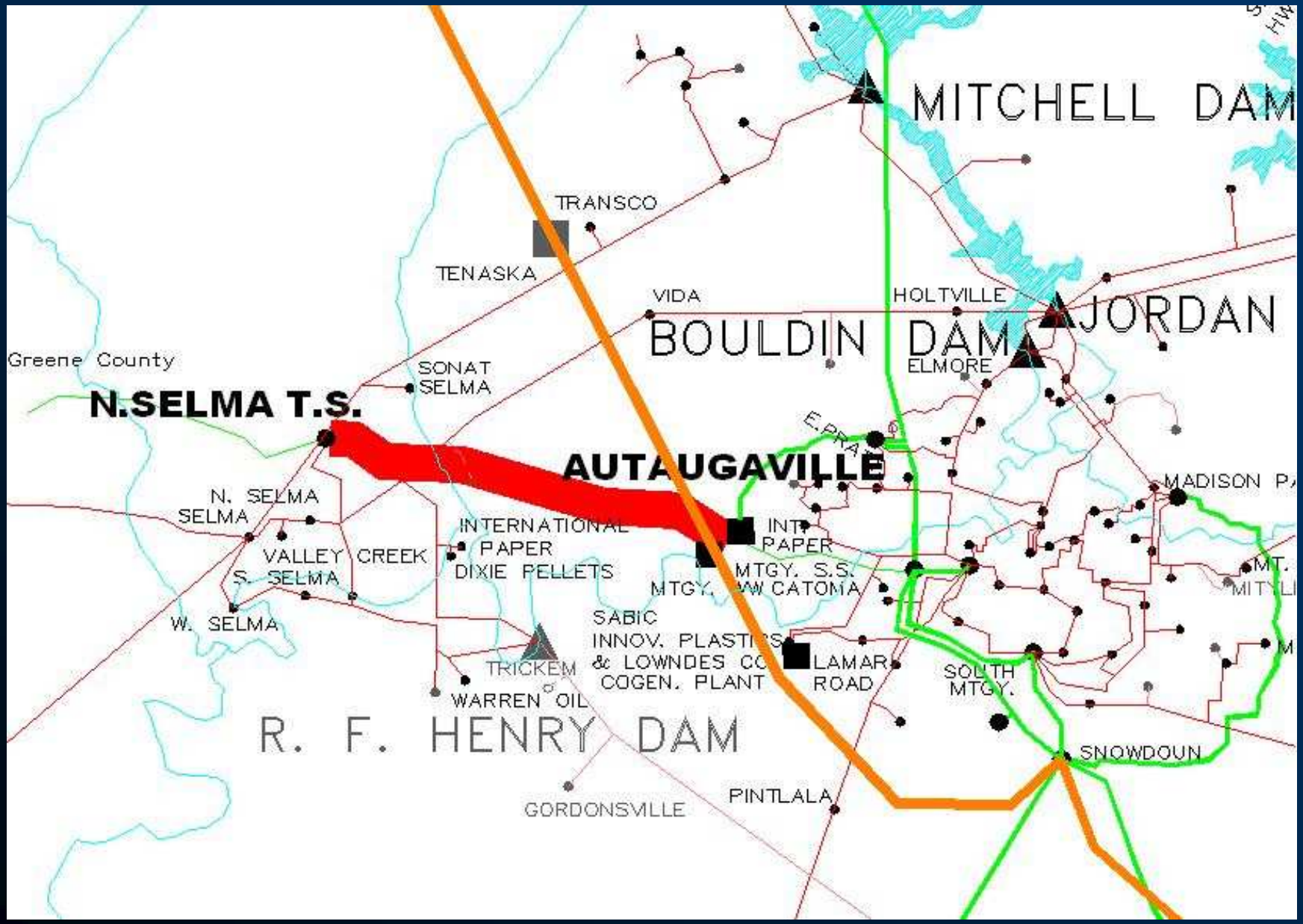
Significant Constraints – PASS 1

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
Attalla – Gulf States Steel 115 kV TL	138	50.7	107.5
Gulf States Steel – N. Rainbow City 115 kV TL	112	57.4	123.6
N. Rainbow City – Keystone Tap 115 kV TL	112	43.3	110.0
Rainbow City – Keystone Tap 115 kV TL	112	37.5	104.5
North Selma – Autaugaville 230 kV TL	404	78.2	101.1

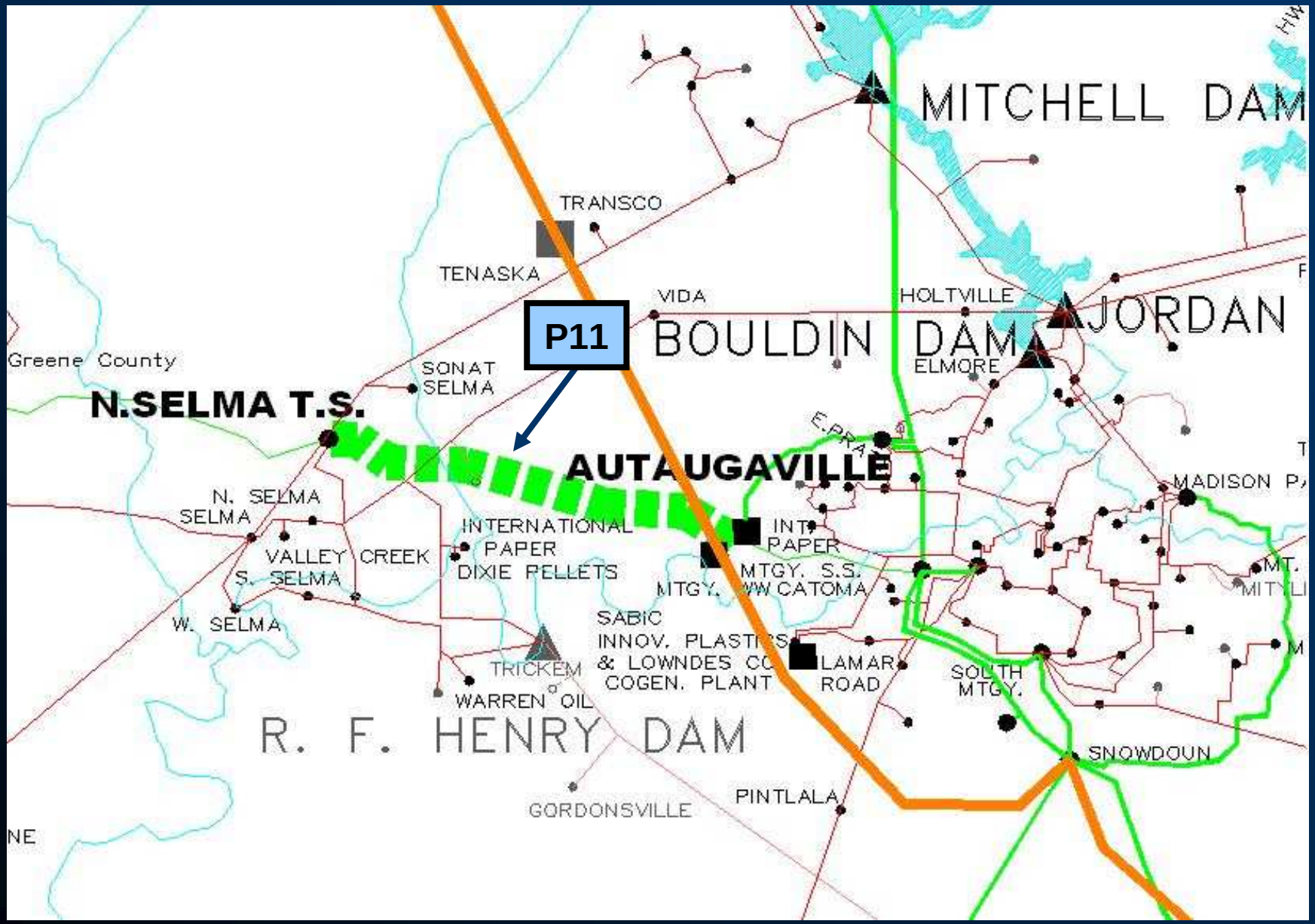
Overloaded Elements

Potential Enhancements

Overloaded Elements



Potential Enhancements



Southeastern Regional TRANSMISSION PLANNING

TVA Border to SBA 1500 MW

Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	Attalla 161 / 115 kV XFMR Attalla – Albertville 161 kV TL	$6,600,000(1)
P2	Celanese – Metal Container 115 kV TL	$765,000
P3	Friendship – Lineville 115 kV TL	$3,971,000
P4	Athena – Hartwell 230 kV TL	$46,762,000(1)
P5	Hillabee – LaGrange 230 kV TL	$51,766,000
P6	Sunny Level Tap – Kellyton 115 kV TL	$255,000
P7	Woodstock – Ragsdale 230 kV TL	$200,000
P8	Sonat Ell Jct. – Talbot County 115 kV TL	$5,422,000
P9	Attalla – Gulf States Steel 115 kV TL	$1,015,000
-	- Continued -	-

(1) Cost provided is for the portion of the solution located within the participating Transmission Owners' territory

TVA Border to SBA 1500 MW

Projects Identified

Item	Proposed Enhancements	Cost ($)
-	- Continued -	-
P10	Gulf States Steel – Rainbow City 115 kV TL	$2,208,000
P11	North Selma – Autaugaville 230kV TL	$6,847,000

Total Cost (2016$) = $125,811,000

Questions on the TVA Border to SBA Transfer?

SCPSA Border

to

SBA

200 MW

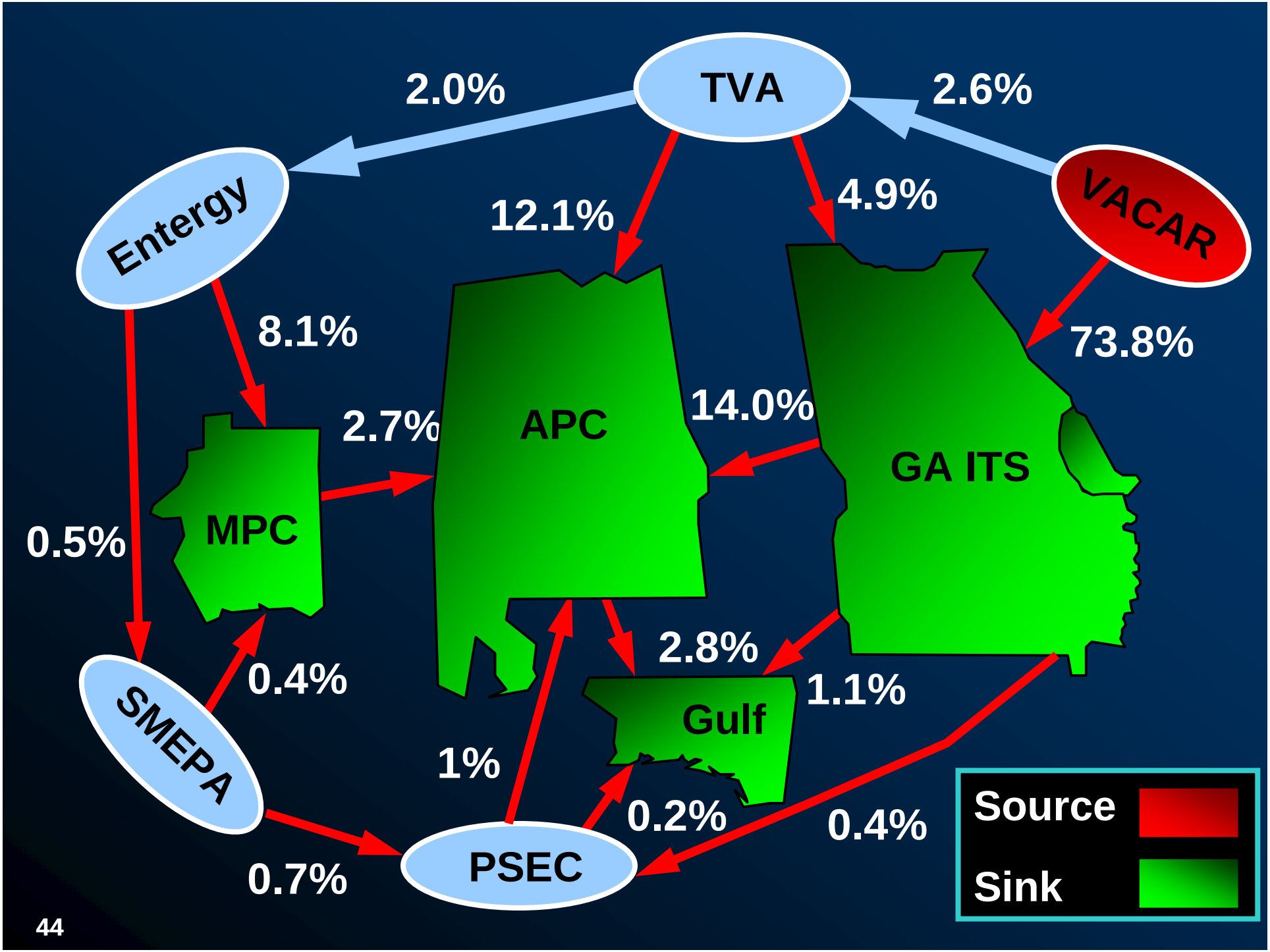
Southeastern Regional TRANSMISSION PLANNING

Duke Border to SBA 2000 MW

- Transfer Type: Load to Generation
- Source: Uniform Load Reduction in Duke
- Sink: Generation within the SBA

Source

Sink


TVA
Entergy
VACAR
APC
MPC
GA ITS
Gulf
SMEPA
PSEC
2.0%
2.6%
12.1%
4.9%
8.1%
73.8%
2.7%
14.0%
0.5%
2.8%
0.4%
1.1%
1%
0.2%
0.4%
0.7%
Source
Sink

SCPSA Border to SBA
200 MW

Transmission System Impacts

- Thermal Constraints Identified:
  - None

Questions on the SCPSA Border to SBA Transfer?

Duke Border

to

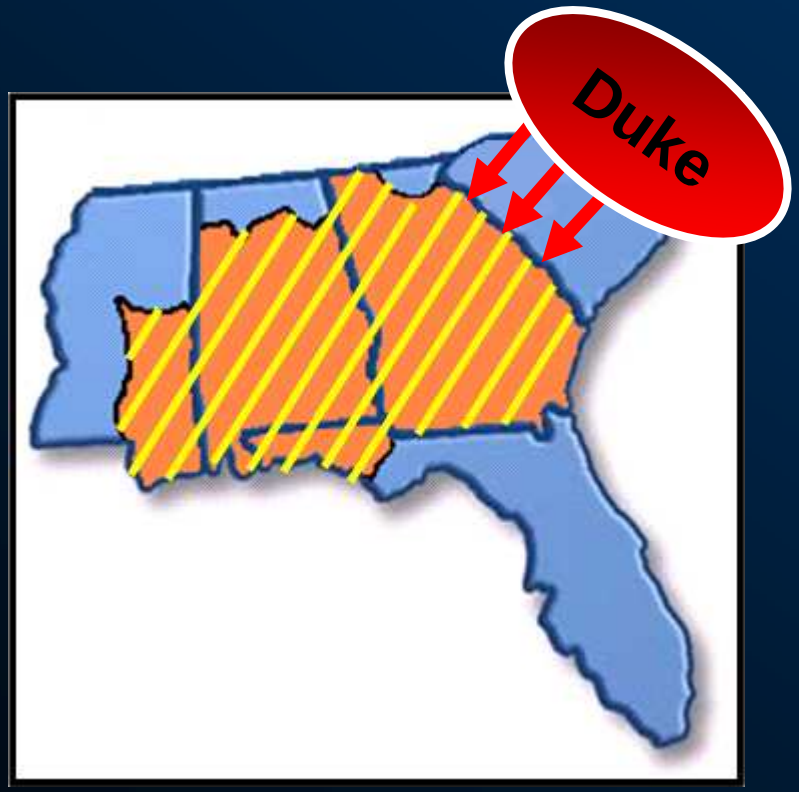
SBA

2000 MW

Southeastern Regional TRANSMISSION PLANNING

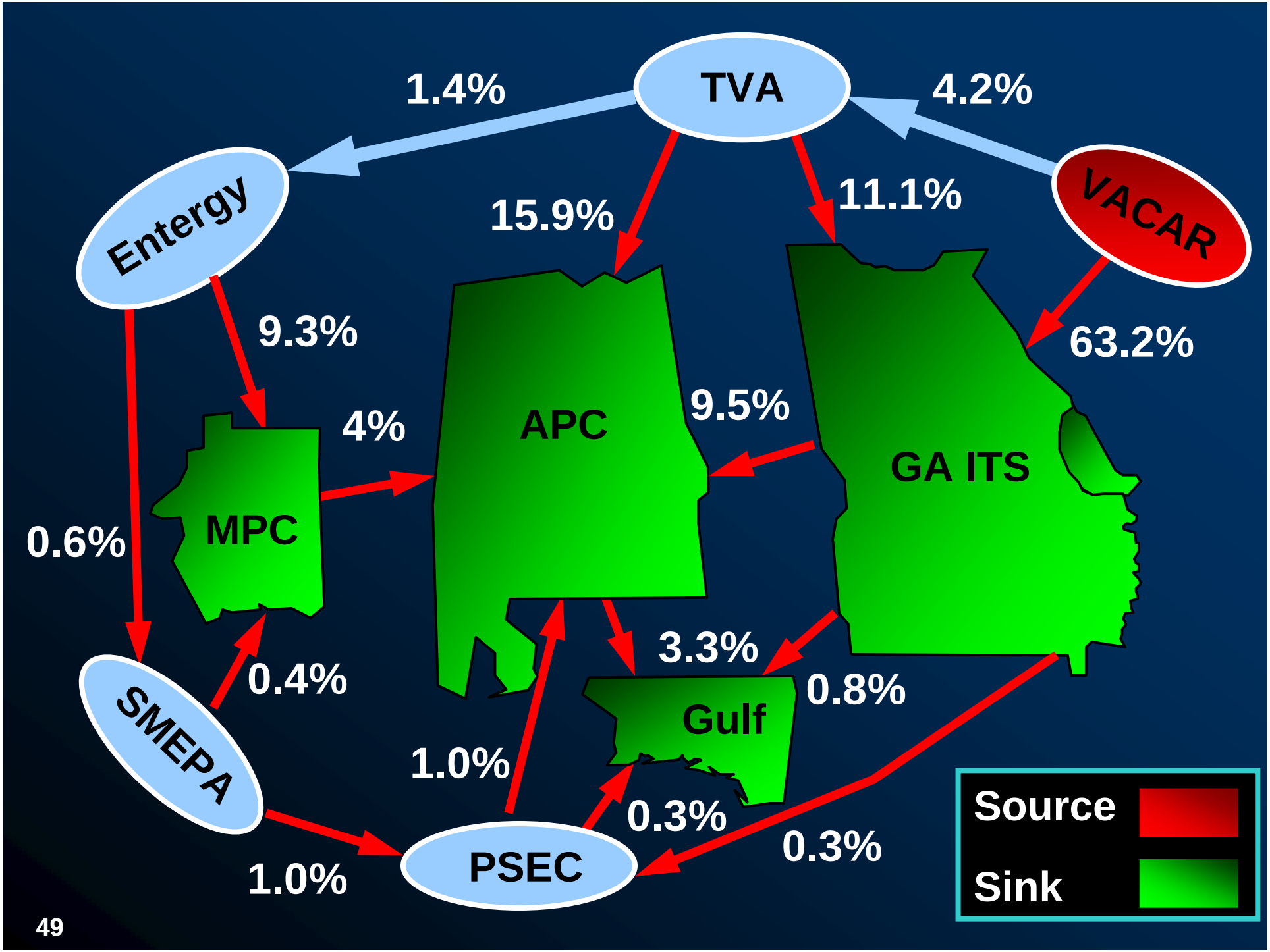
Duke Border to SBA 2000 MW

- Transfer Type: Load to Generation
- Source: Uniform Load Reduction in Duke
- Sink: Generation within the SBA



Source

Sink


TVA
1.4%
4.2%
Entergy
VACAR
15.9%
11.1%
9.3%
63.2%
4%
APC
9.5%
GA ITS
MPC
0.6%
3.3%
0.4%
0.8%
Gulf
SMEPA
1.0%
0.3%
1.0%
PSEC
0.3%
Source
Sink

Southeastern Regional TRANSMISSION PLANNING

Duke Border to SBA 2000 MW

Transmission System Impacts

- Thermal Constraints Identified:
  - Two (2) 500 kV Lines(1)
  - One (1) 500 / 230 kV Transformer
  - Two (2) 230 / 115 kV Transformers
  - Twelve (12) 230 kV Lines
  - Two (2) 161 / 115 kV Transformers
  - One (1) 161 kV Line
  - Six (6) 115 kV Lines

(1) The limiting elements for these 500 kV Lines are not within the SBA

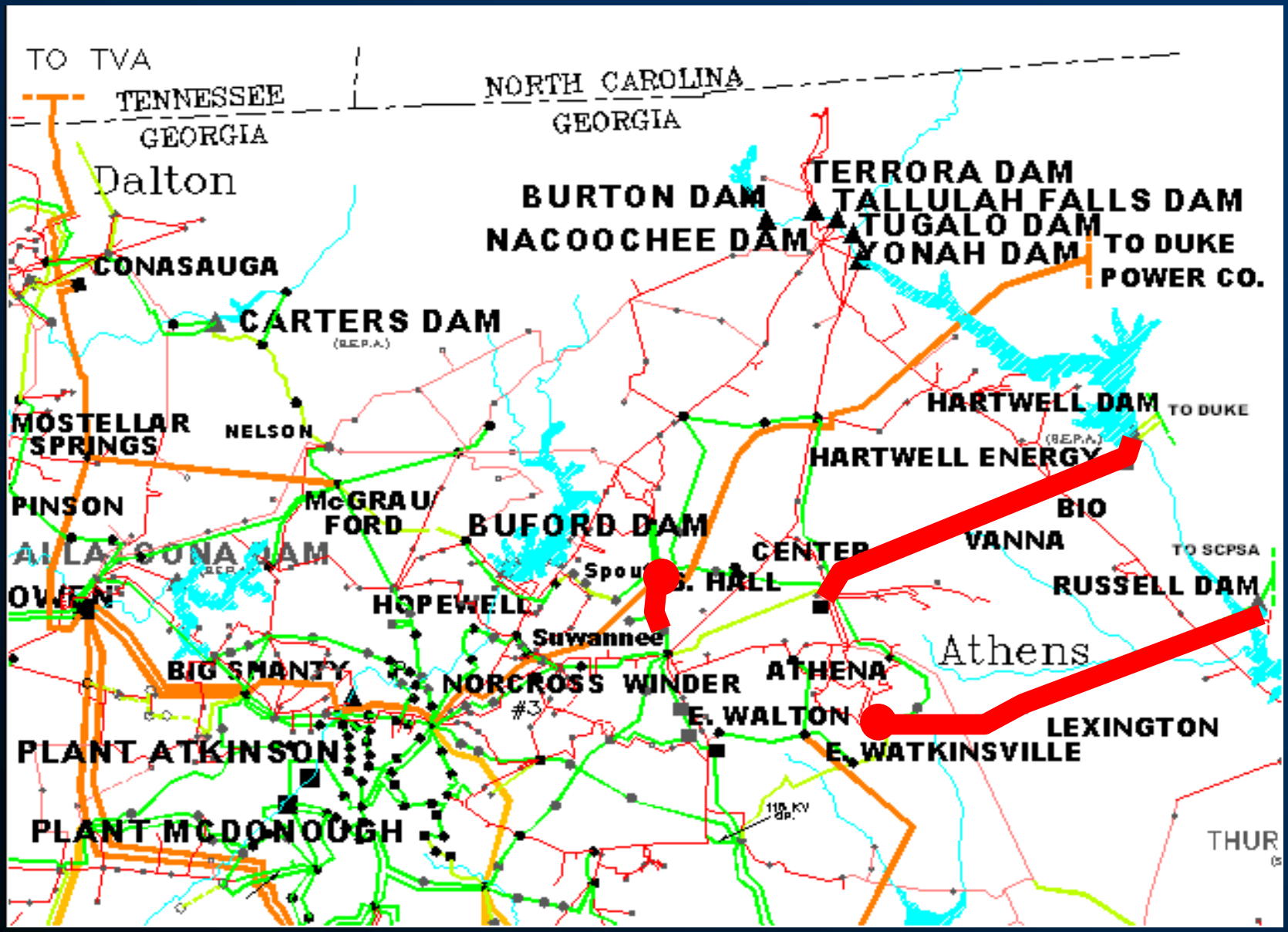
Duke Border to SBA 2000 MW

Significant Constraints – PASS 0

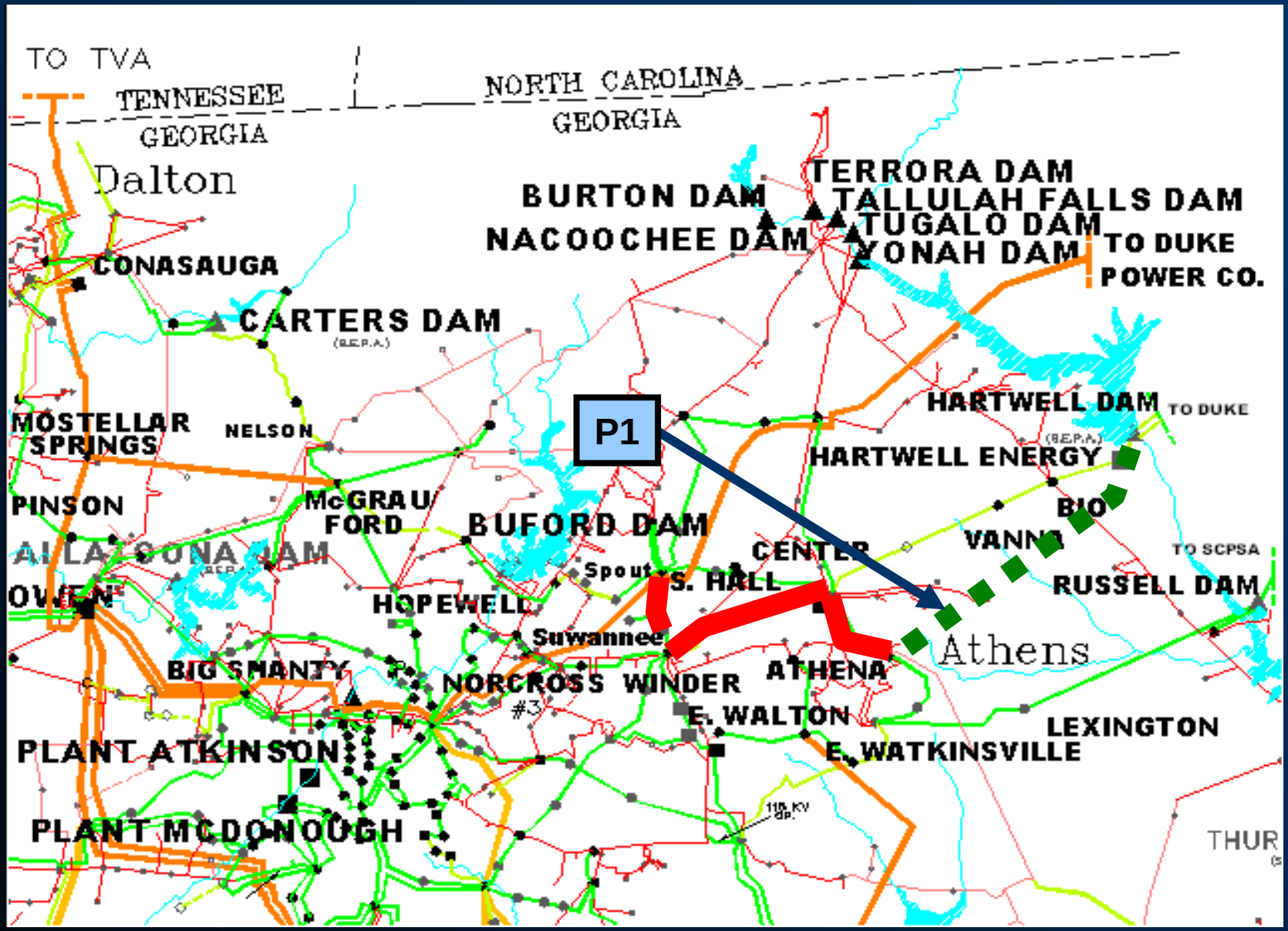
Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
South Hall 500 / 230 kV XFMR	2016	76.9	102.5
Lexington – Russell 230 kV TL	596	94.5	125.5
Lexington – East Watkinsville 230 kV TL	602	90.3	121.0
East Watkinsville 230 / 115 kV XFMR	332	88.4	108.9
Bio – Vanna 230 kV TL	433	92.9	118.9
South Hall – Oconee 500 kV TL(1)	2598	84.2	112.6
Conasauga – Bradley 500 kV TL(2)	2598	92.6	106.7

(1) The limiting element is within DUKE
(2) The limiting element is within TVA

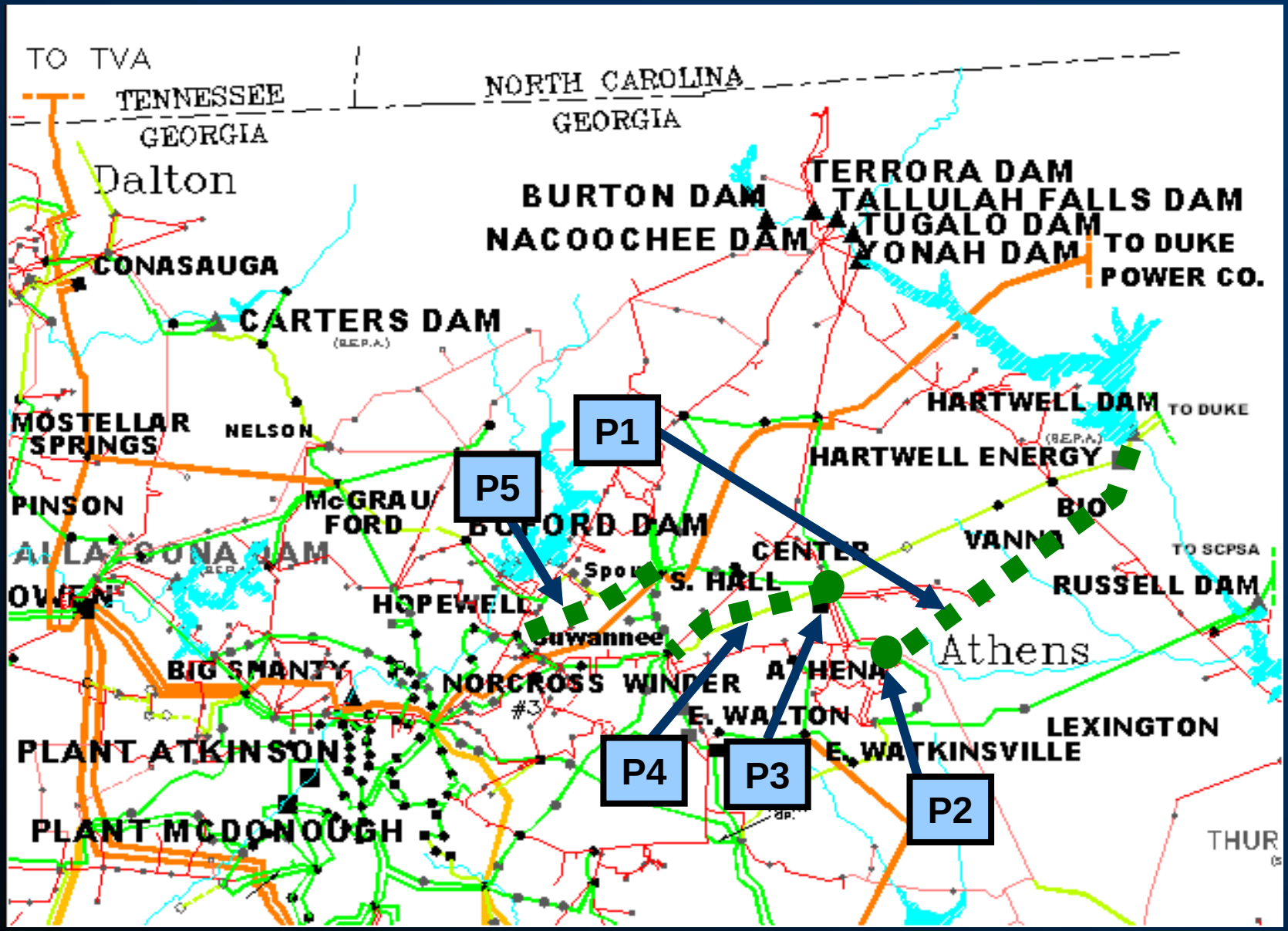
Overloaded Elements



Potential Enhancements



Potential Enhancements

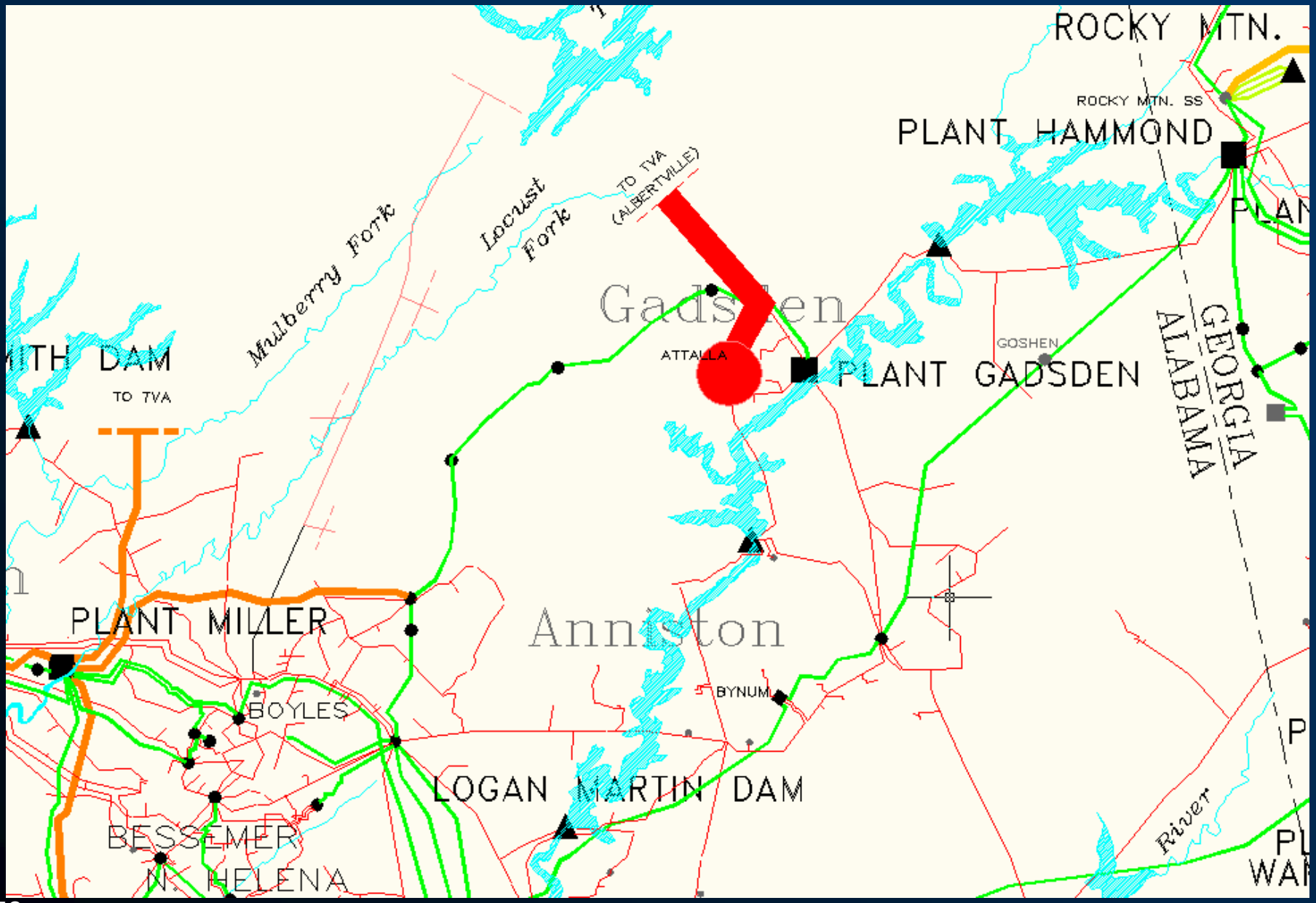


Duke Border to SBA 2000 MW

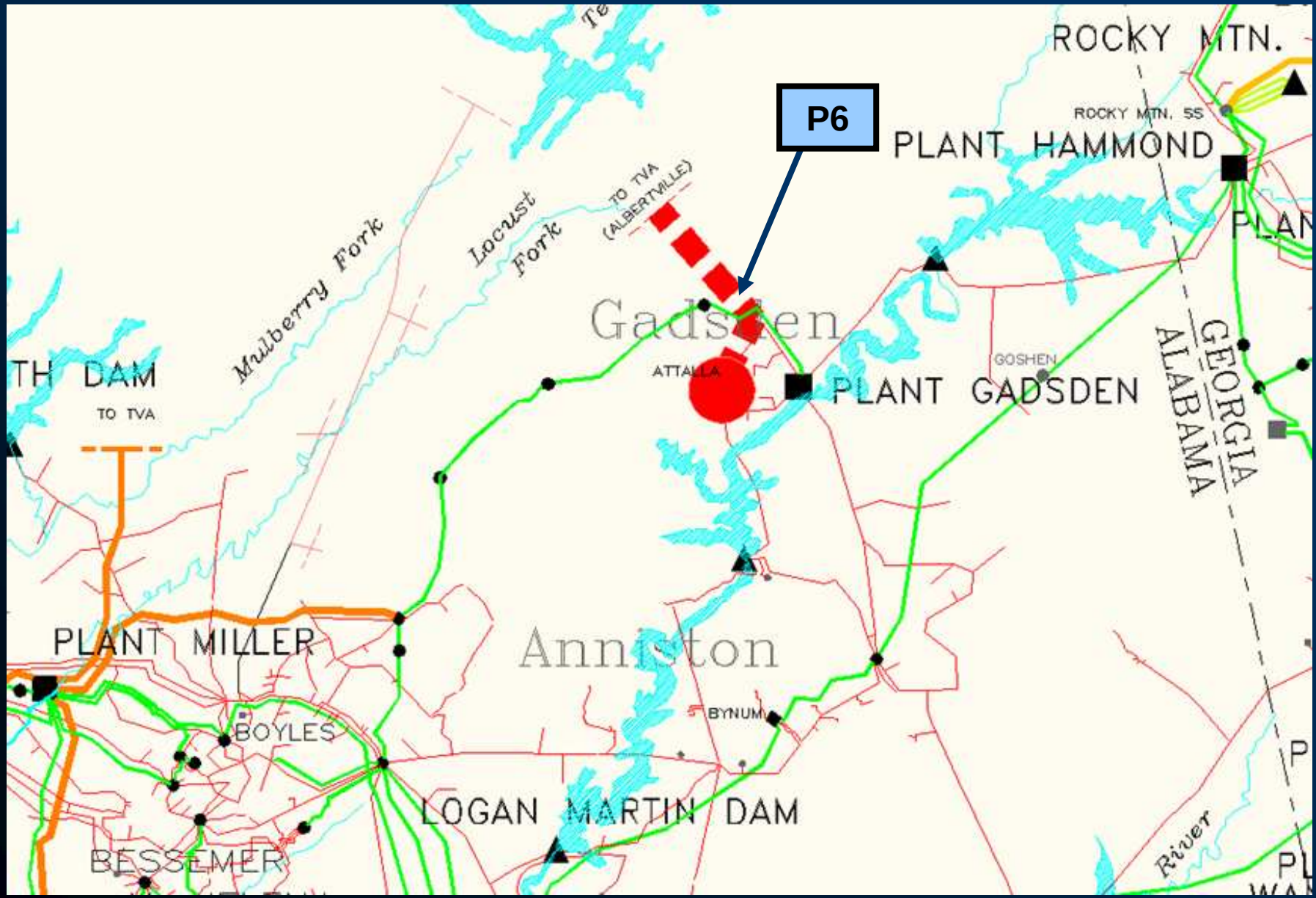
Significant Constraints – PASS 1

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
Attalla – Albertville 161 kV TL	193	72.0	126.7
Attalla 161 / 115 kV XFMR	99	63.1	116.9
Attalla 161 / 115 kV XFMR	111	67.1	113.2

Overloaded Elements



Potential Enhancements

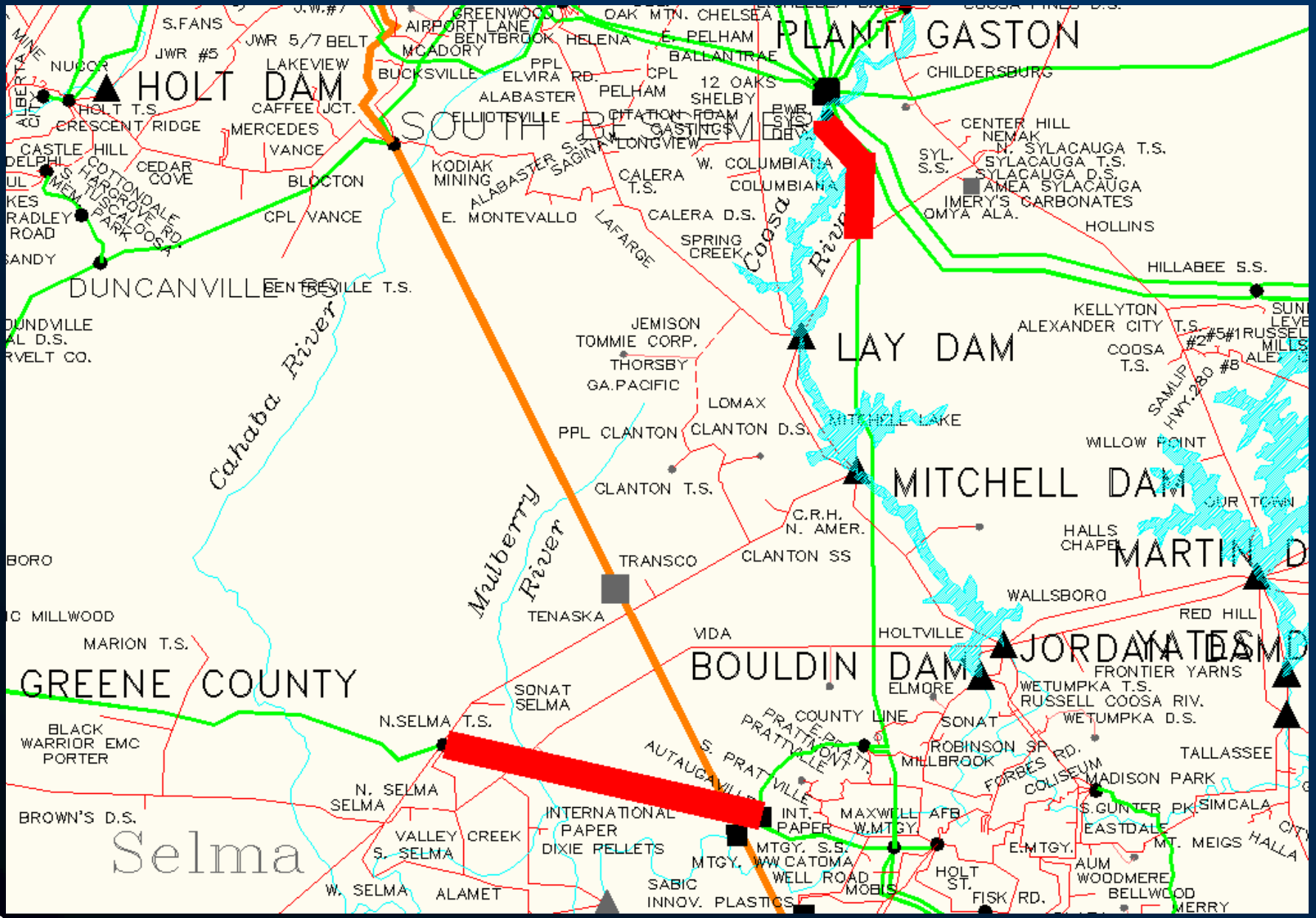


Duke Border to SBA 2000 MW

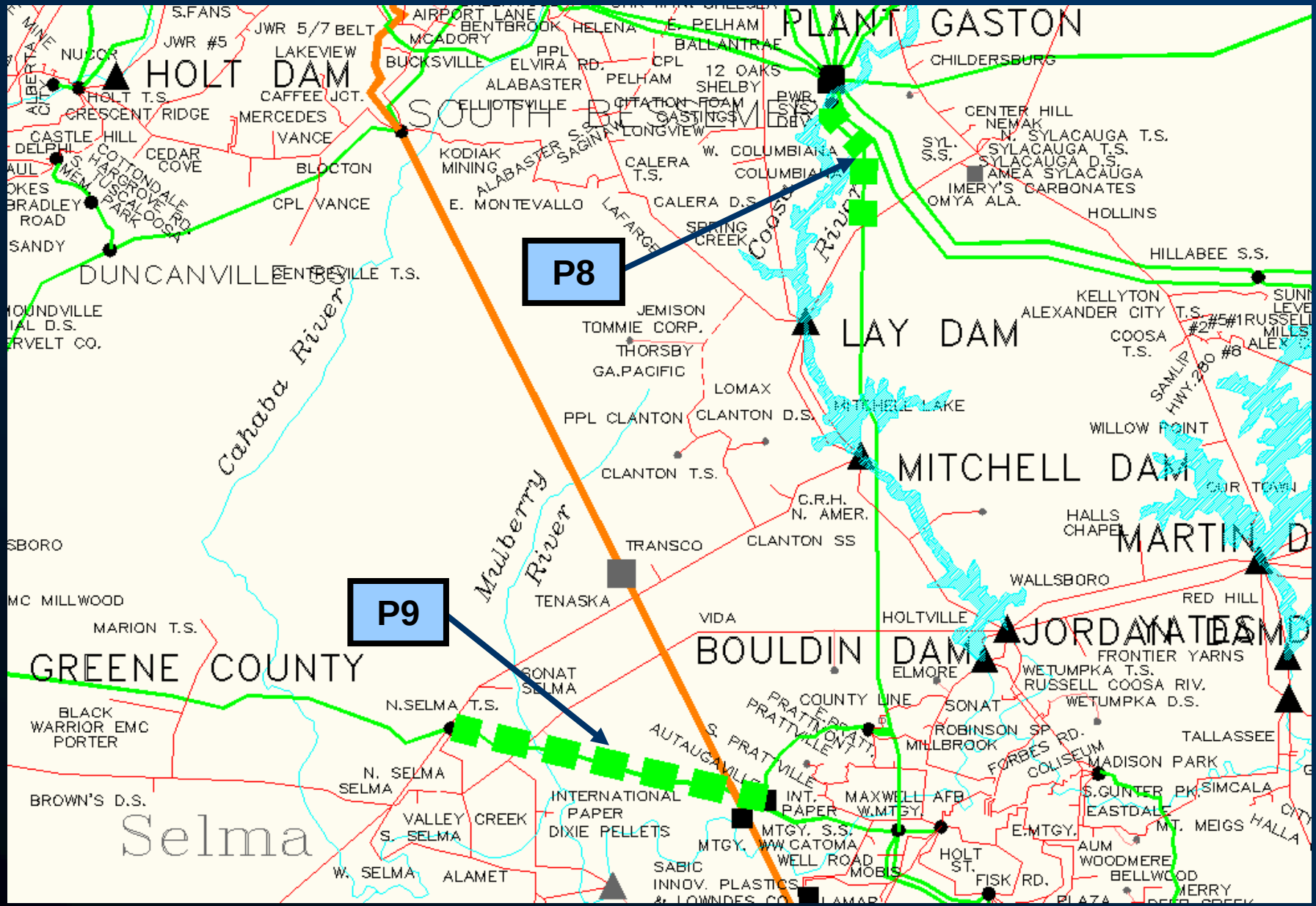
Significant Constraints – PASS 2

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
North Selma – Autaugaville 230 kV TL	404	78.2	101.5
Power Systems – Fayetteville 230 kV TL	502	96.3	101.1

Overloaded Elements



Potential Enhancements



Southeastern Regional TRANSMISSION PLANNING

Duke Border to SBA 2000 MW

Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	Hartwell Dam – Athena 230 kV TL	$50,128,000
P2	Athena – Center Primary 230 kV TL	$165,000
P3	Center Primary – Clarksboro 230 kV TL	$51,000
P4	Winder Primary – Clarksboro 230 kV TL	$8,930,000
P5	South Hall – Spout 230 kV TL Suwanee – Spout 230 kV TL	$20,113,000
P6	Attalla 161 / 115 kV XFMRs Attalla – Albertville 161 kV TL	$6,600,000(1)
P7	West Brunswick – Thalmann 230 kV TL	$4,337,000
P8	Power Systems – Fayetteville 230 kV TL	$4,484,000
-	- Continued -	-

(1) Cost provided is for the portion of the solution located within the participating Transmission Owners' territory

Duke Border to SBA 2000 MW

Projects Identified

Item	Proposed Enhancements	Cost ($)
-	- Continued -	-
P9	North Selma – Autaugaville 230 kV TL	$6,847,000
P10	Attalla – Gulf States Steel 115 kV TL	$1,015,000
P11	Gulf States Steel – Henry Dam 115 kV TL	$2,208,000
P12	Lawrenceville – Moon Road 115 kV TL	$1,382,000
P13	Celanese – Metal Container 115 kV TL	$765,000

Total Cost (2016$) = $107,790,000

Questions on the Duke Border to SBA Transfer?

Southeastern Regional
TRANSMISSION PLANNING

North Georgia to Mississippi 600 MW

Southeastern Regional TRANSMISSION PLANNING

North Georgia to Mississippi 600 MW

- Transfer Type: Generation to Generation
- Source: Murray County 500 kV
- Sink: Generation within Mississippi
  - SMEPA – 126 MW, MPC – 474 MW

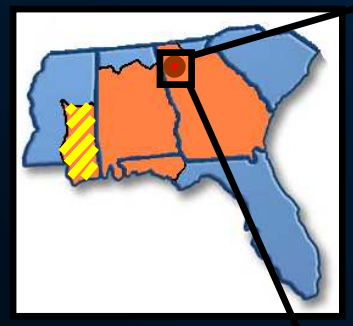
Source

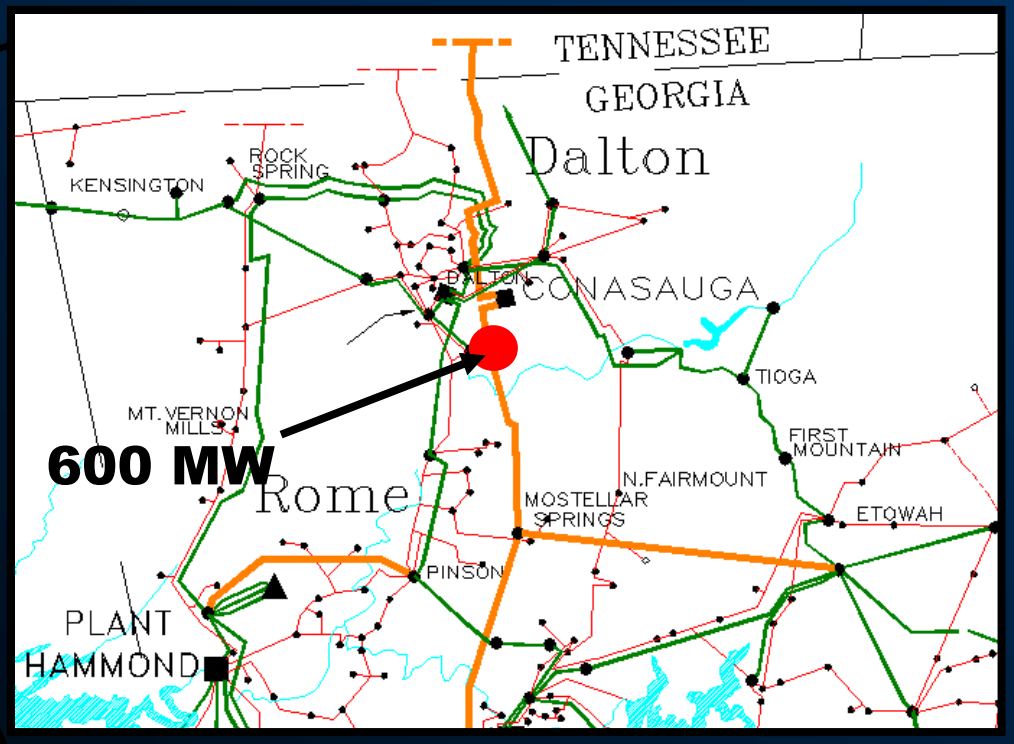
Sink

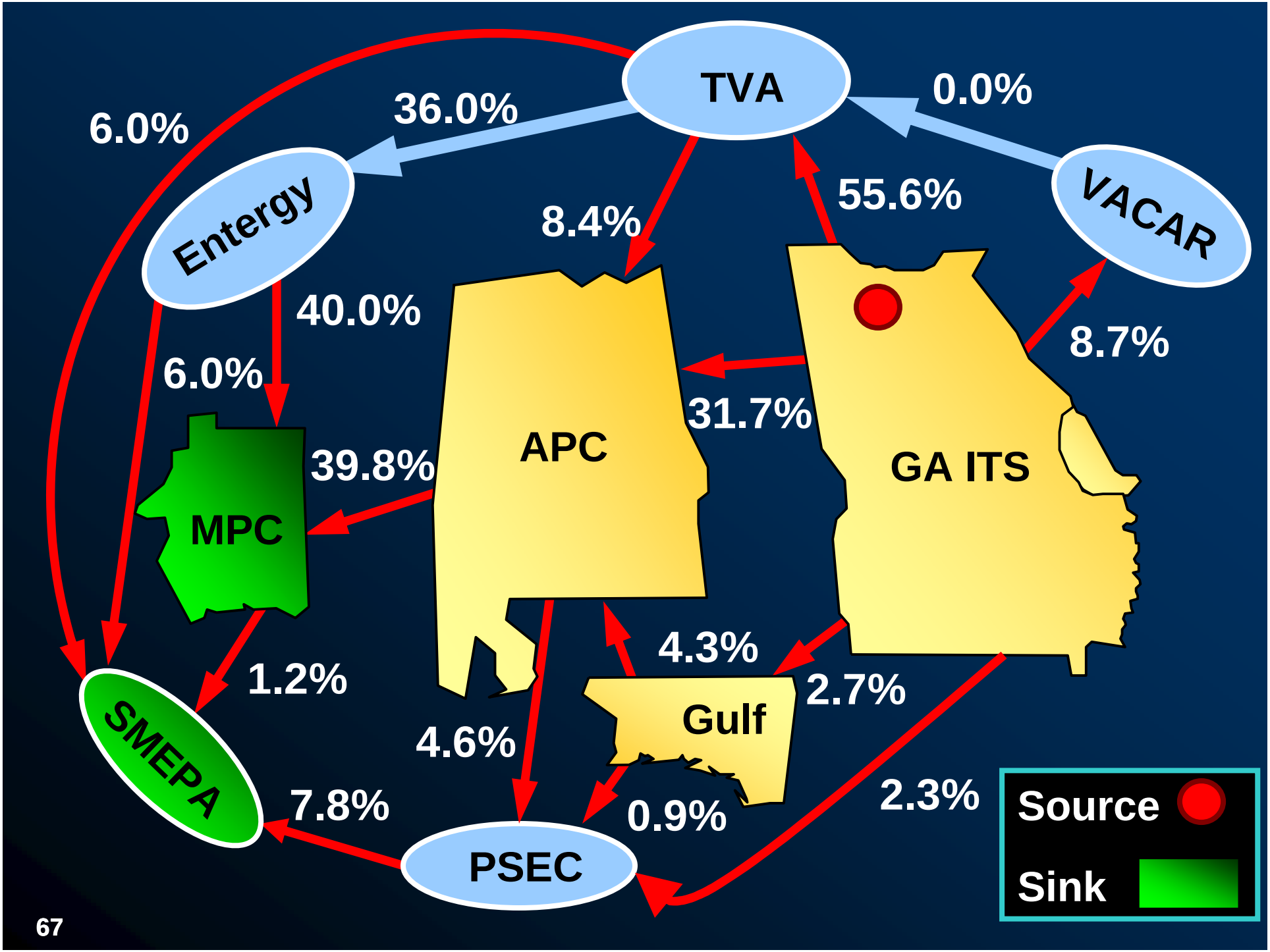
Southeastern Regional TRANSMISSION PLANNING

North Georgia to Mississippi 600 MW

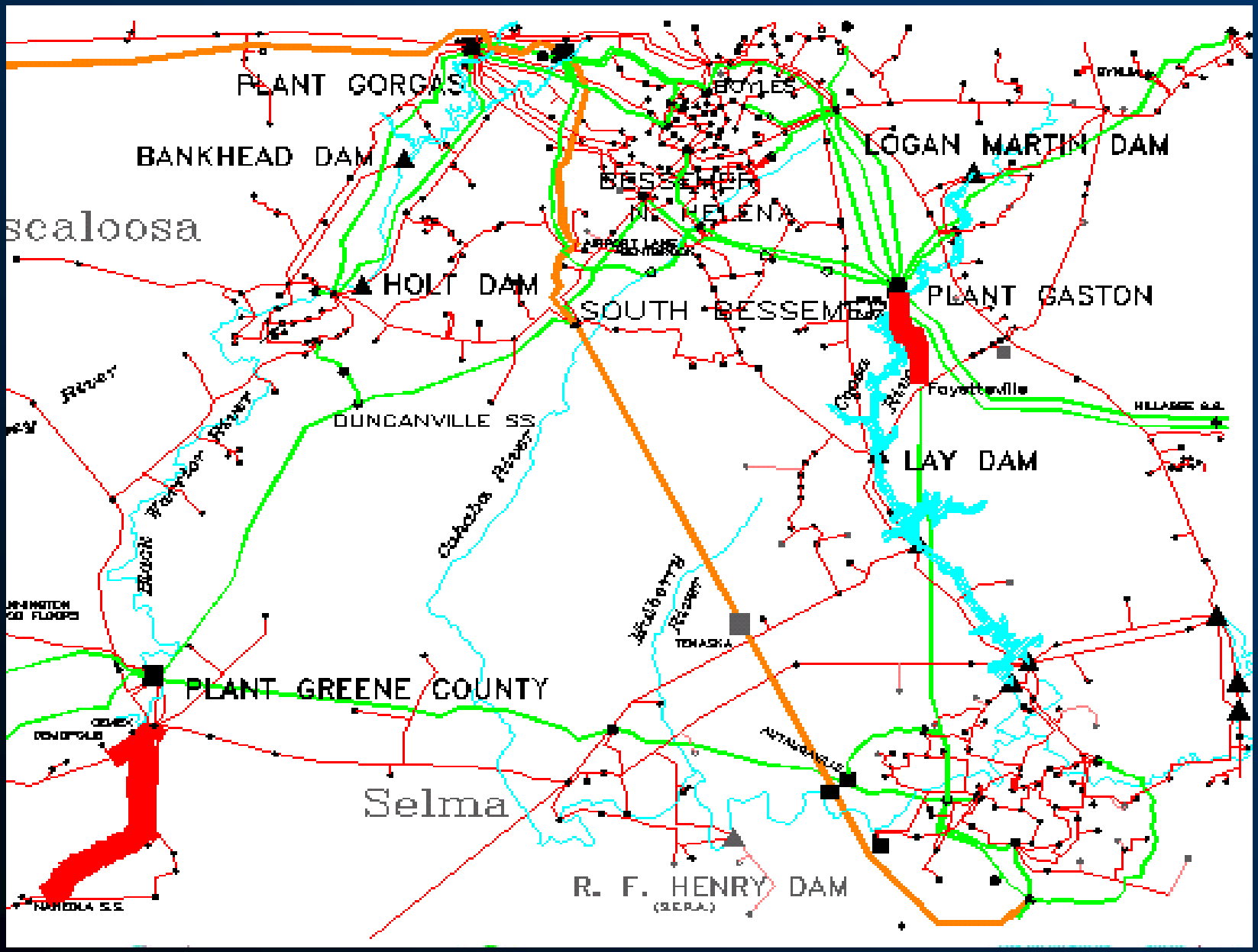
- Transfer Type: Generation to Generation
- Source: Murray County 500 kV
- Sink: Generation within Mississippi
  - SMEPA – 126 MW, MPC – 474 MW



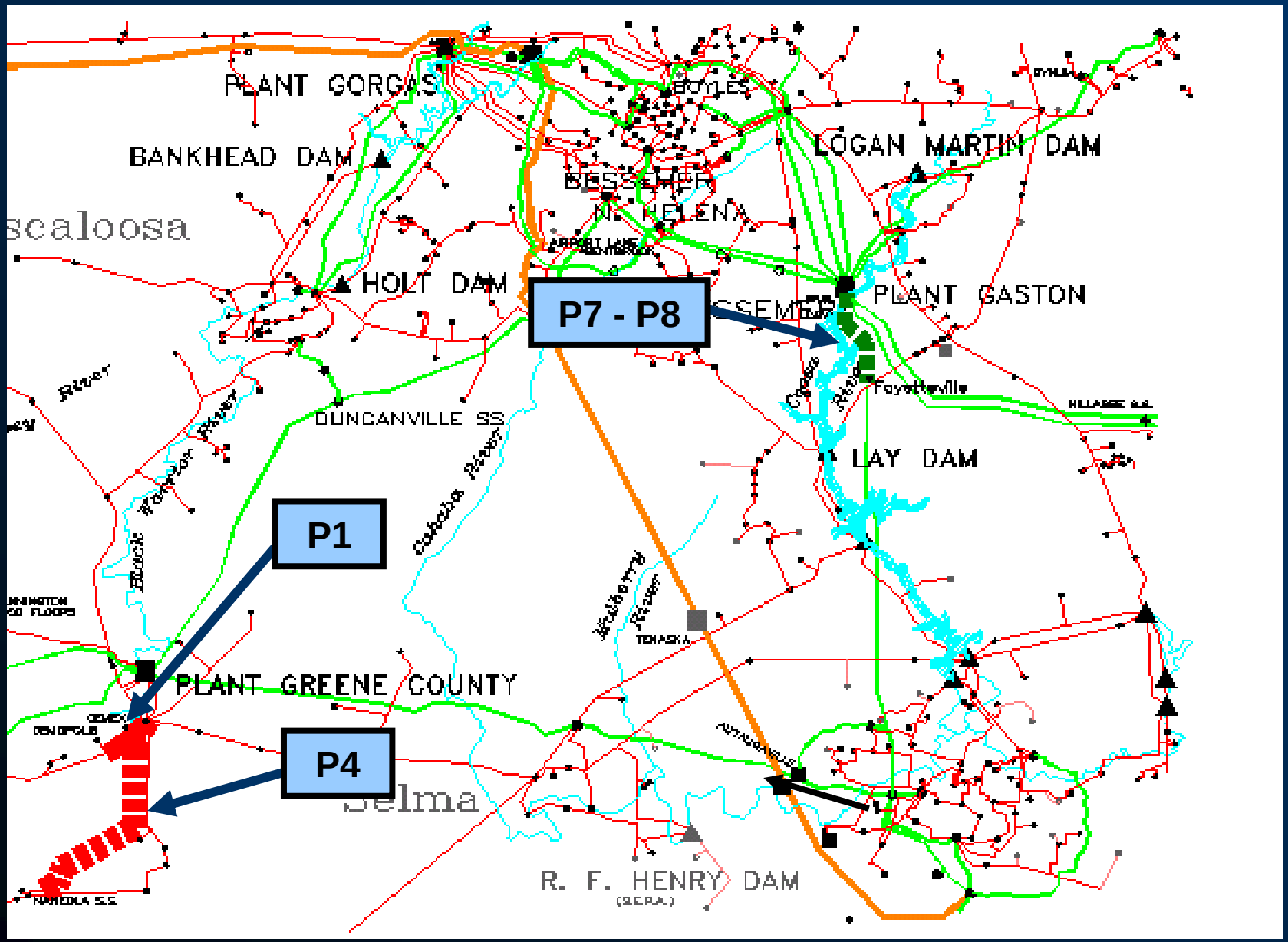



TVA
Entergy
VACAR
APC
GA ITS
MPC
SMEPA
Gulf
PSEC
6.0%
36.0%
0.0%
8.4%
55.6%
40.0%
8.7%
6.0%
31.7%
39.8%
1.2%
4.3%
2.7%
4.6%
7.8%
0.9%
2.3%
Source
Sink

Overloaded Elements



Potential Enhancements



Southeastern Regional TRANSMISSION PLANNING

North Georgia to Mississippi 600 MW

Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	Demopolis – CEMEX 115 kV TL	$304,000
P2	Livingston – Mannington 115 kV TL	$2,366,000
P3	Willingham Drive – East Point 115 kV TL	$2,400,000
P4	Demopolis TS – Naheola SS 115 kV TL	$6,564,000
P5	Airport Lane – Bentbrook Tap 115 kV TL	$148,000
P6	North Brewton TS – North Brewton DS 115 kV TL	$6,409,000
P7	Power Systems – Fayetteville 230 kV TL	$9,278,000
P8	Gaston – Power Systems 230 kV TL	$300,000
P9	GKN Westland Aerospace – Halla Climate Control 115 kV TL	$1,100,000

Total Cost (2016$) = $28,869,000

Questions on the North Georgia to Mississippi Transfer?

Questions?

SERC Regional Model Development Update

2010 SERTP

❖SERC Regional Model Development

- Data Bank Update ("DBU")
  - June 7th – June 11th
  - SERC Models Completed
- Linear Transfers and AC verification performed
- Currently compiling the results into the report

FRCC Update

❖Southern / FRCC Interface

- Total Transfer Capability Study
  - Evaluates 2011 TTC for use in OASIS postings utilized in the operating horizon
  - Southern and FRCC have completed updated internal models
  - Study is on-going

2009 – 2010 SIRPP Economic Studies Update

2009 – 2010 SIRPP

Five Economic Planning Studies

- Entergy to Georgia ITS (2000 MW)
  - Study Year: 2014
  - Step 2 Evaluation
- MISO to TVA (2000 MW)
  - Study Year: 2015
- Kentucky to Georgia ITS (1000 MW)
  - Study Year: 2015
- SPP to SIRPP via HVDC (3000 MW)
  - Study Year: 2018
- MISO & PJM West (SMART) to SIRPP (3000 MW)
  - Study Year: 2018

Southeastern Regional TRANSMISSION PLANNING

Entergy to Georgia ITS 2000 MW

Transmission System Impacts

- Thermal Constraints Identified:
  - One (1) 500 kV Lines
  - One (1) 500 / 230 kV Transformer
  - Ten (10) 230 kV Lines
  - Four (4) 230 / 115 kV Transformers
  - Six (6) 161 kV Lines
  - Fifteen (15) 115 kV Lines

Total Cost (2014$) = $330,246,000

Southeastern Regional TRANSMISSION PLANNING

MISO to TVA 2000 MW

Transmission System Impacts

- Thermal Constraints Identified:
  - One (1) 230 kV Line
  - One (1) 161 kV Line
  - One (1) 115 kV Line

Total Cost (2015$) = $53,720,000

Southeastern Regional TRANSMISSION PLANNING

Kentucky to Georgia ITS 1000 MW

Transmission System Impacts

- Thermal Constraints Identified:
  - One (1) 345 kV Line
  - Two (2) 161 kV Lines

Total Cost (2015$) = $18,700,000

Southeastern Regional TRANSMISSION PLANNING

SPP to SIRPP via HVDC 3000 MW

Transmission System Impacts

- Thermal Constraints Identified:
  - One (1) 500 / 161 kV Transformer
  - Three (3) 230 kV Lines
  - Six (6) 161 kV Lines
  - Seven (7) 115 kV Lines

Total Cost (2018$) = $124,906,000

Southeastern Regional TRANSMISSION PLANNING

SMART to SIRPP 3000 MW

Transmission System Impacts

- Thermal Constraints Identified:
  - One (1) 500 / 161 kV Transformer
  - One (1) 345 / 138 kV Transformer
  - One (1) 230 kV Line
  - Sixteen (16) 161 kV Lines
  - One (1) 138 kV Line
  - Two (2) 115 kV Lines

Total Cost (2018$) = $252,904,000

Southeastern Regional TRANSMISSION PLANNING

2009 – 2010 SIRPP Update

- More detailed information concerning these studies is available on the Southeast Inter-Regional Participation Process website at the following link:
  - http://www.southeastirpp.com/
- 2010 – 2011 SIRPP 1st Meeting will be held on October 25th, 2010 in Charlotte, NC

- Feedback
  - Alternative Solutions
    - 10 Year Transmission Expansion Plan
    - Economic Planning Study Results
  - 2011 Interactive Training
    - How detailed / technical
    - Desired topics?
  - Overall Feedback

Next Meeting Activities

- Annual Transmission Planning Summit
  - Location: TBD
  - Date: December 2010
  - Purpose:
    - Final Economic Planning Results
    - Final 10 Year Transmission Expansion Plan
    - Assumptions Input Session