Welcome

SERTP 2013 – 4th Quarter Meeting

"Annual Transmission Planning Summit & Assumptions Input Meeting"

2013 SERTP

The SERTP process is a transmission planning process.

Please contact the respective transmission provider for questions related to real-time operations or OATT transmission service.

Purposes & Goals of the Meeting

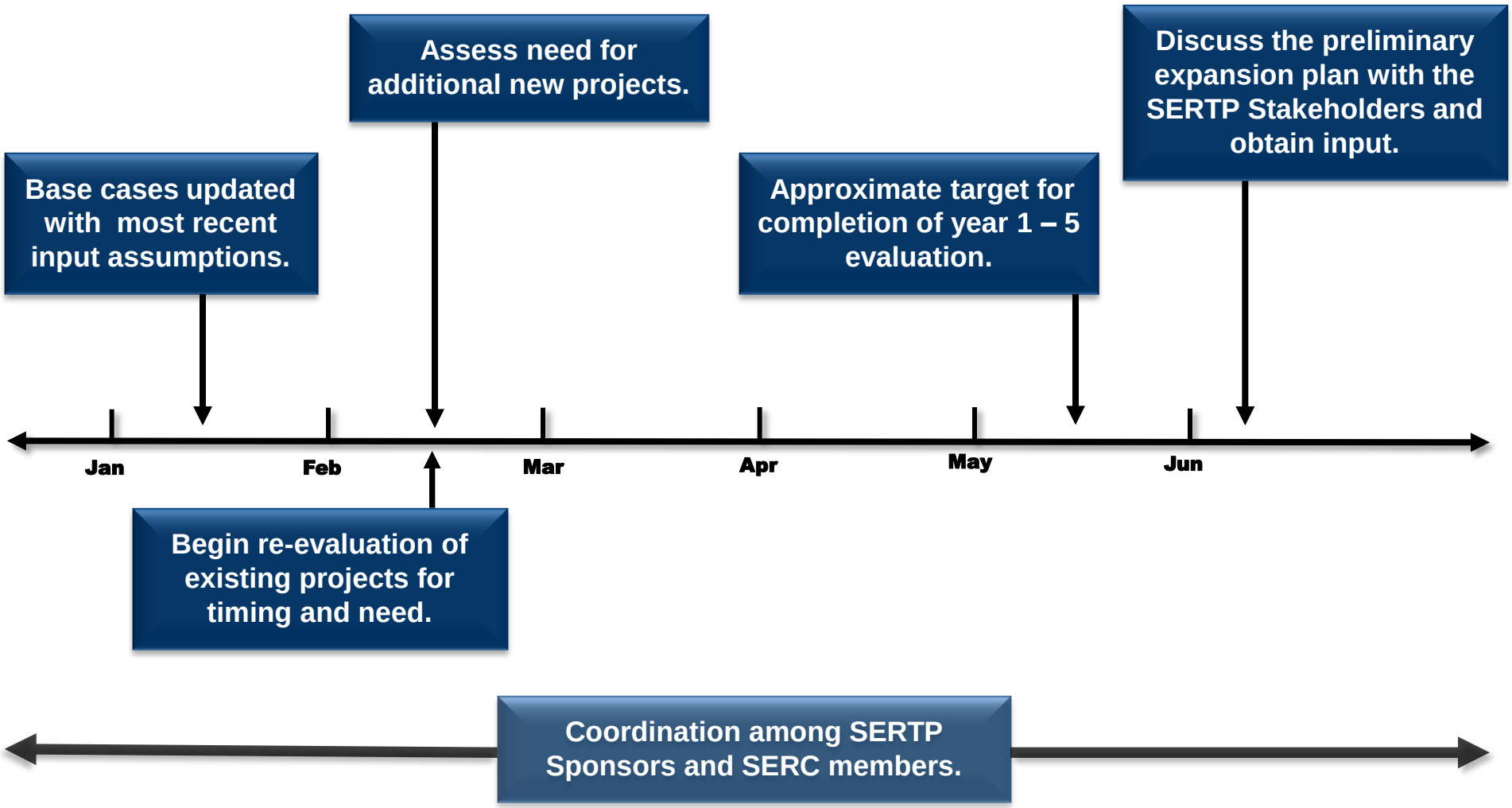
- **10 Year Transmission Expansion Plan**
  - East
  - West
- **2013 Economic Planning Study Results**
- **Preliminary 2014 Modeling Assumptions**
  - Load Forecast
  - Generation Assumptions
- **Miscellaneous Updates**
- **Upcoming 2014 SERTP Process**

Ten Year Expansion Plan

Southeastern Regional TRANSMISSION PLANNING

10 Year Expansion Plan Timeline

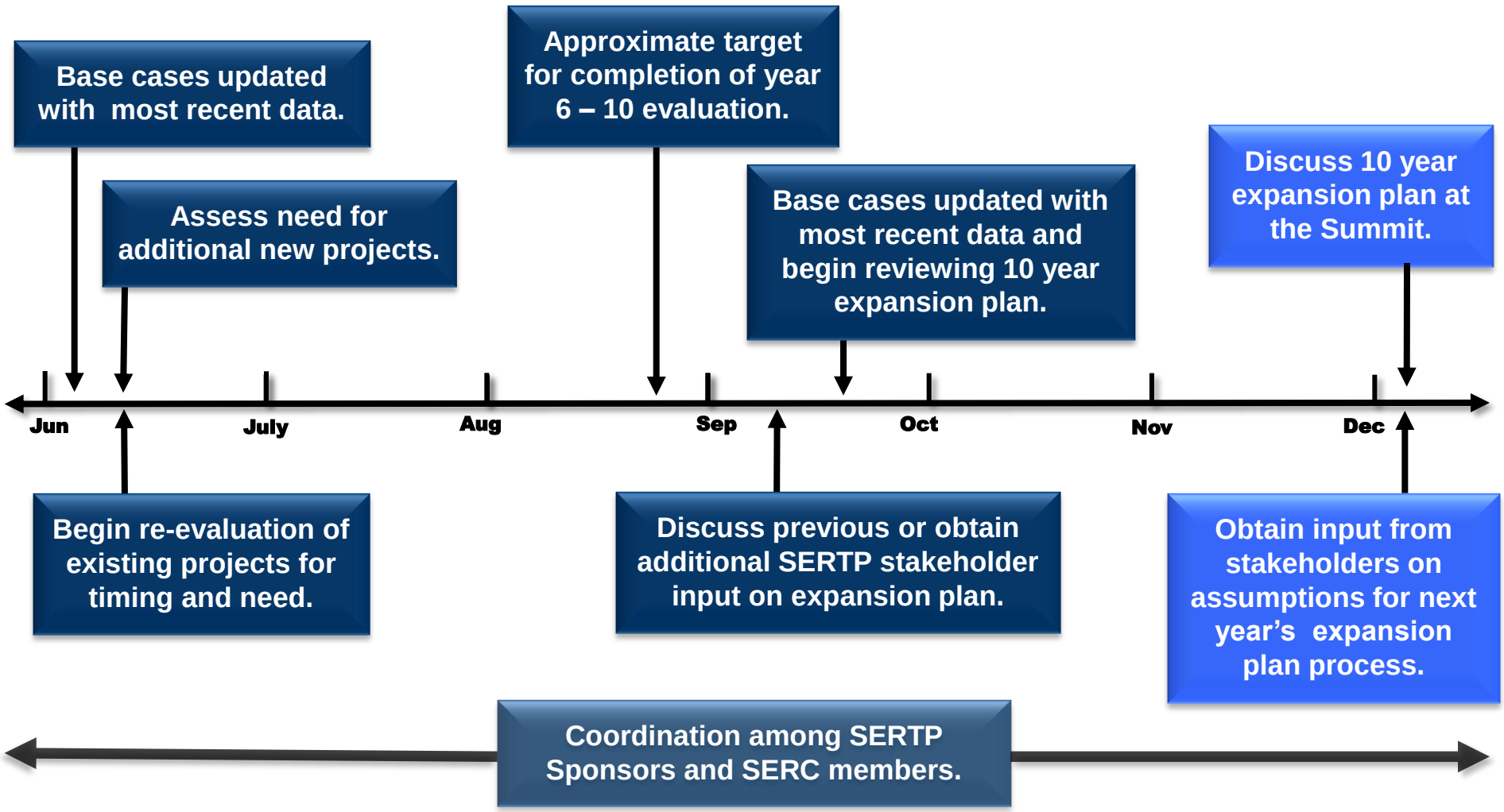
Approximate Planning Time Line (Years 1 – 5)



Southeastern Regional TRANSMISSION PLANNING

10 Year Expansion Plan Timeline

Approximate Planning Time Line (Years 6 – 10)



2013 SERTP

The projects described in this presentation represent the ten (10) year expansion plan. The expansion plan is periodically reviewed and may be revised due to changes in assumptions.

This presentation does not represent a commitment to build for projects listed in the future.

2013 SERTP

The in-service date of each project is June 1st of the stated project year, unless otherwise specified.

The need date of each project is the same as the in-service date, unless otherwise specified.

2013 Ten Year Expansion Plan

EAST

WEST

PowerSouth Energy Cooperative

Dalton Utilities

GeorgiaTransmission

MEAG POWER

South Mississippi Electric Power Association

Southern Company — Energy to Serve Your World℠

Economic Planning Studies

Five Economic Planning Studies

- **Southern to SCPSA Border**
  - 500 MW (2015 Winter Peak)
- **Southern to SCE&G Border**
  - 500 MW (2015 Winter Peak)
- **TVA Border to Southern**
  - 1500 MW (2017 Spring Valley)
- **TVA Border to Southern**
  - 1500 MW (2017 Summer Peak)
- **Southern to PJM**
  - 1000 MW (2023 Summer Peak)

Power Flow Cases Utilized

- **Study Years: 2015, 2017, 2023**
- **Load Flow Cases:**
  - **2013 Series Version 2A**
    - **Summer Peak**
    - **Shoulder**
    - **Winter Peak**
    - **Spring Valley**

Economic Planning Studies

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

2013 SERTP

The following information depicts recommended enhancements for the proposed transfer levels above and beyond existing, firm commitments. Therefore, this information does not represent a commitment to proceed with the recommended enhancements nor implies that the recommended enhancements could be implemented by the study dates (2015, 2017, 2023).

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

2013 SERTP

Southern
to
SCPSA Border

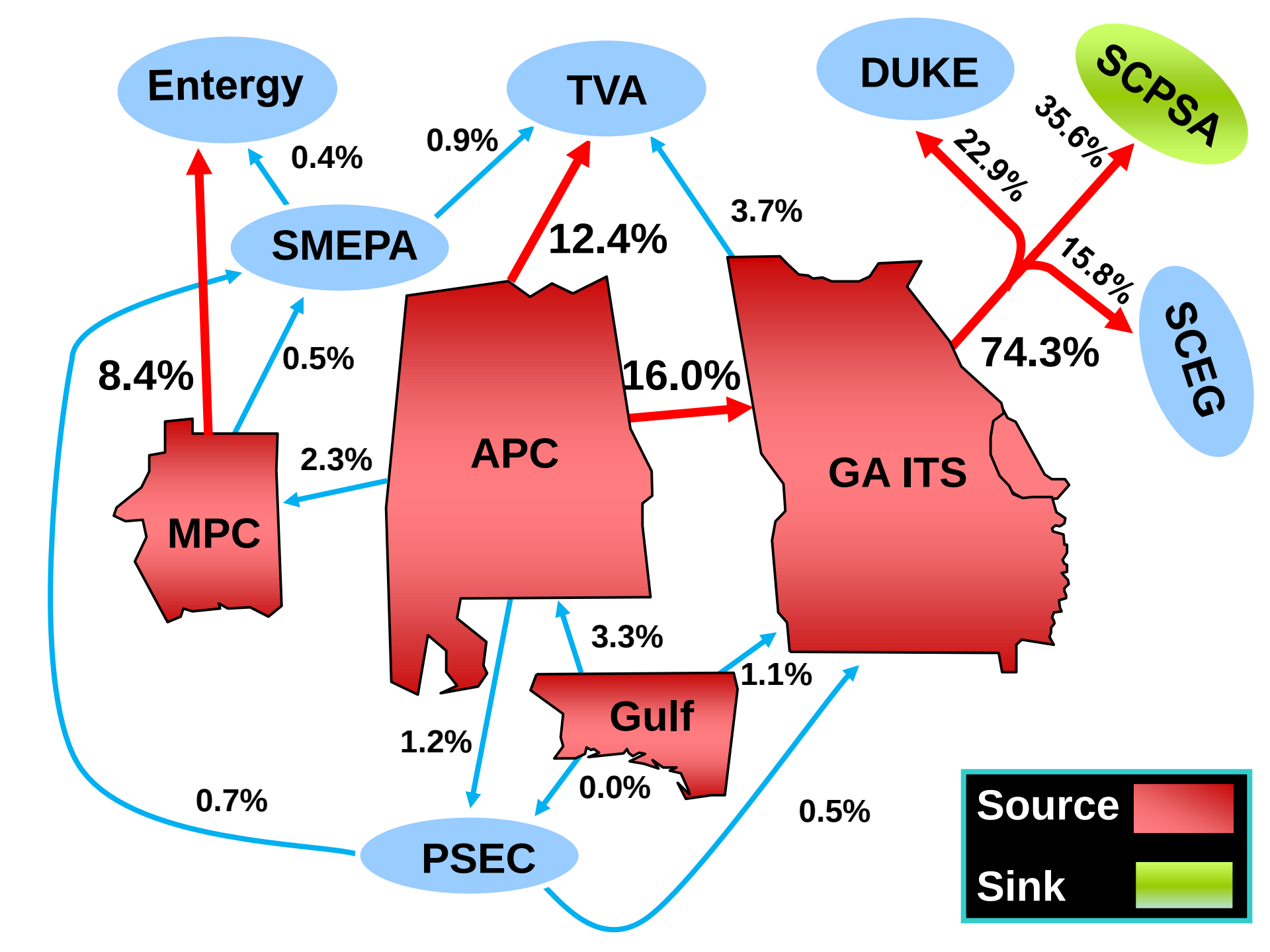
500 MW

Southern to SCPSA Border
500 MW

- **Transfer Type:** Generation to Load (2015 Winter Peak)
- **Source:** Southern Generation
- **Sink:** Uniform load scale in SCPSA

Source

Sink


Entergy
TVA
DUKE
SCPSA
SMEPA
SCEG
APC
GA ITS
MPC
Gulf
PSEC
0.4%
0.9%
22.9%
35.6%
3.7%
12.4%
15.8%
8.4%
0.5%
74.3%
16.0%
2.3%
3.3%
1.1%
1.2%
0.0%
0.7%
0.5%
Source
Sink

Southern to SCPSA Border 500 MW

Transmission System Impacts

- **Thermal Constraints Identified:**
  - One (1) 115 kV T.L.

Total Cost (2013$) = $9,000,000

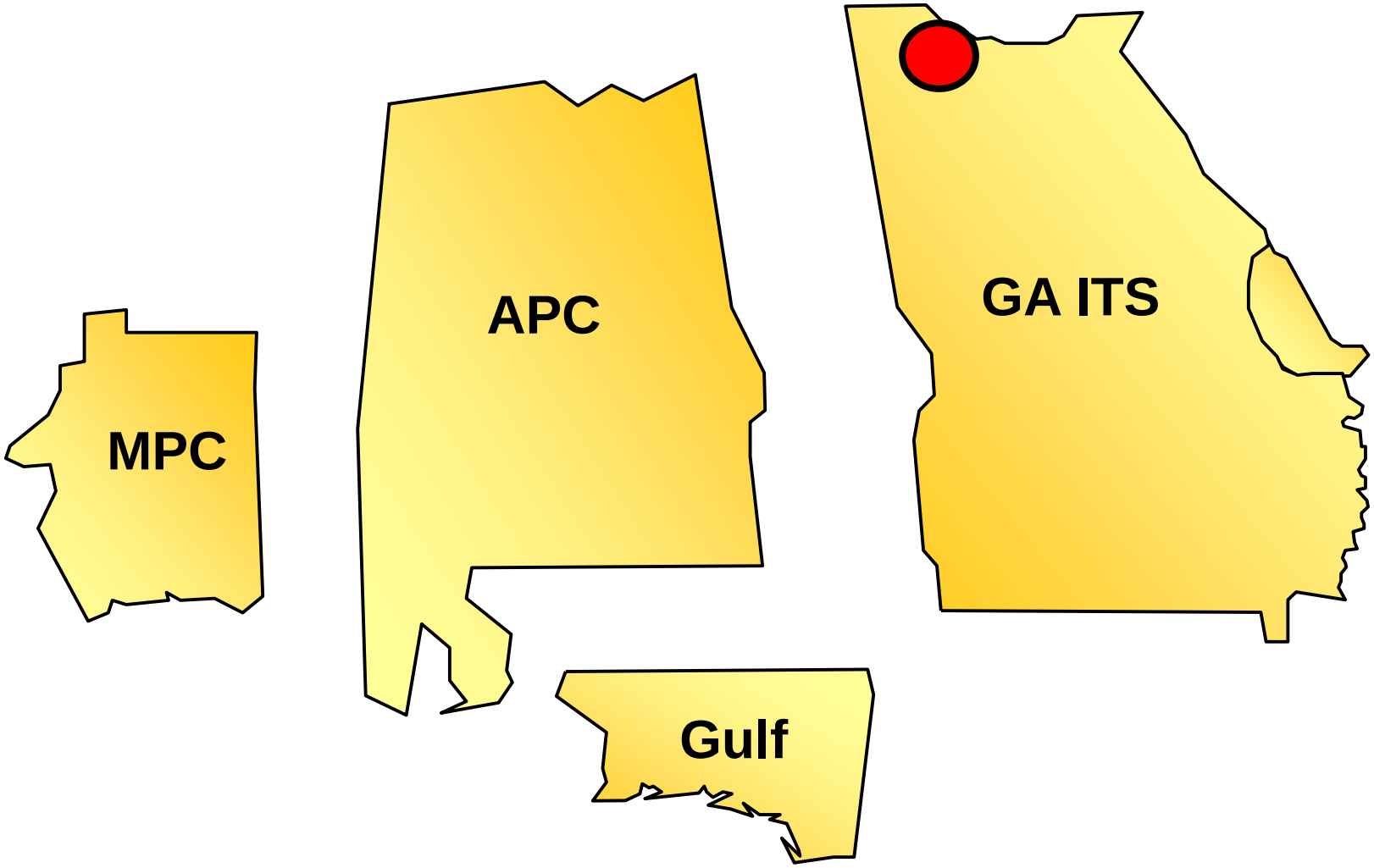
Southern to SCPSA Border 500 MW

Significant Constraints – Pass 0

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
Chatsworth – Coosawattee 115 kV TL	137	91.9	102.4

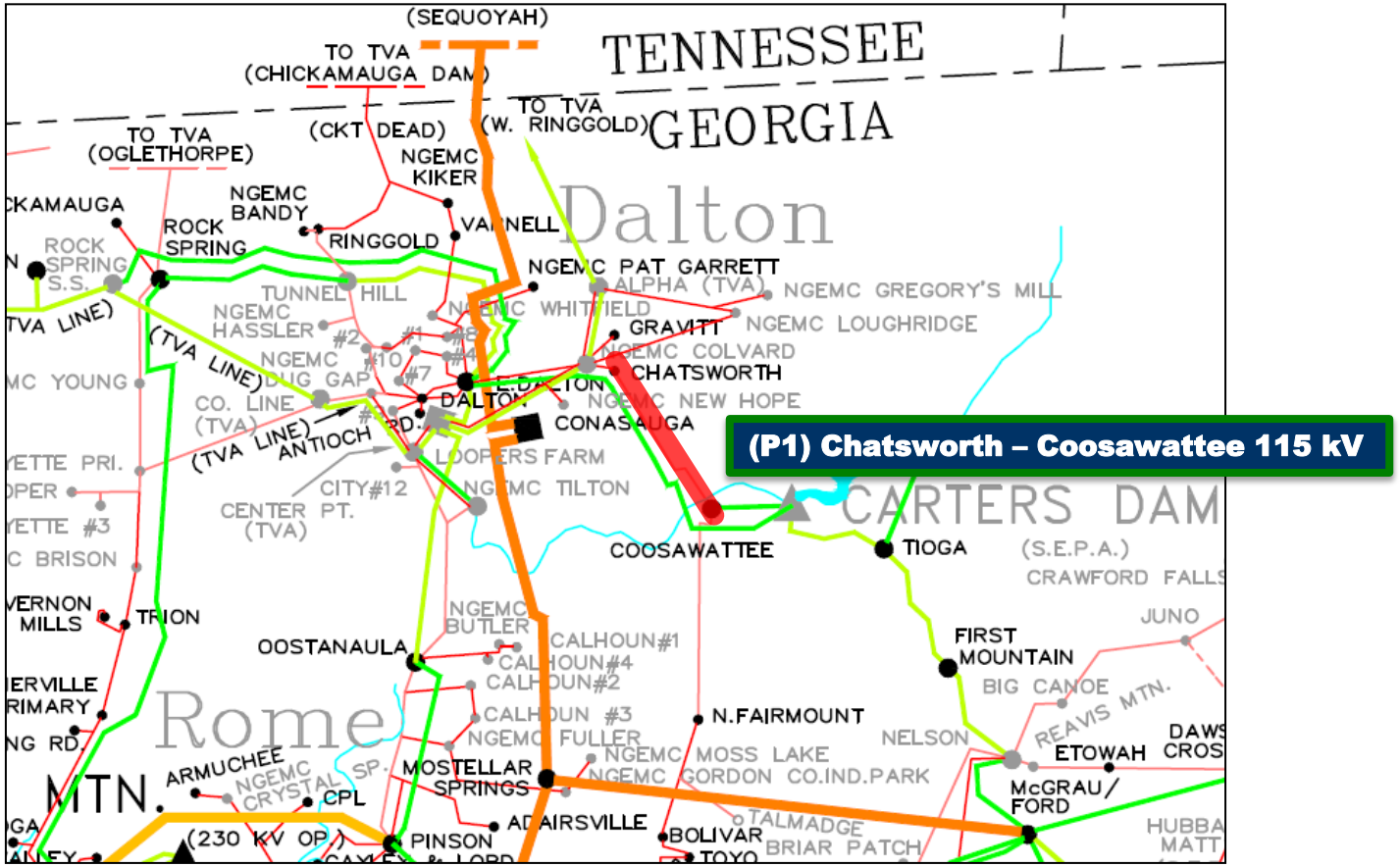
Southern to SCPSA Border 500 MW

Significant Constraints – Pass 0



Southern to SCPSA Border 500 MW

Significant Constraints – Pass 0



Southern to SCPSA Border 500 MW

Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	**Chatsworth – Coosawattee 115 kV T.L.** - Reconductor approximately 12 miles of 336 ACSR 115 kV transmission line with 795 ACSR at 100°C.	**$9,000,000**

Total Cost (2013$) = $9,000,000

Southern
to
SCE&G Border

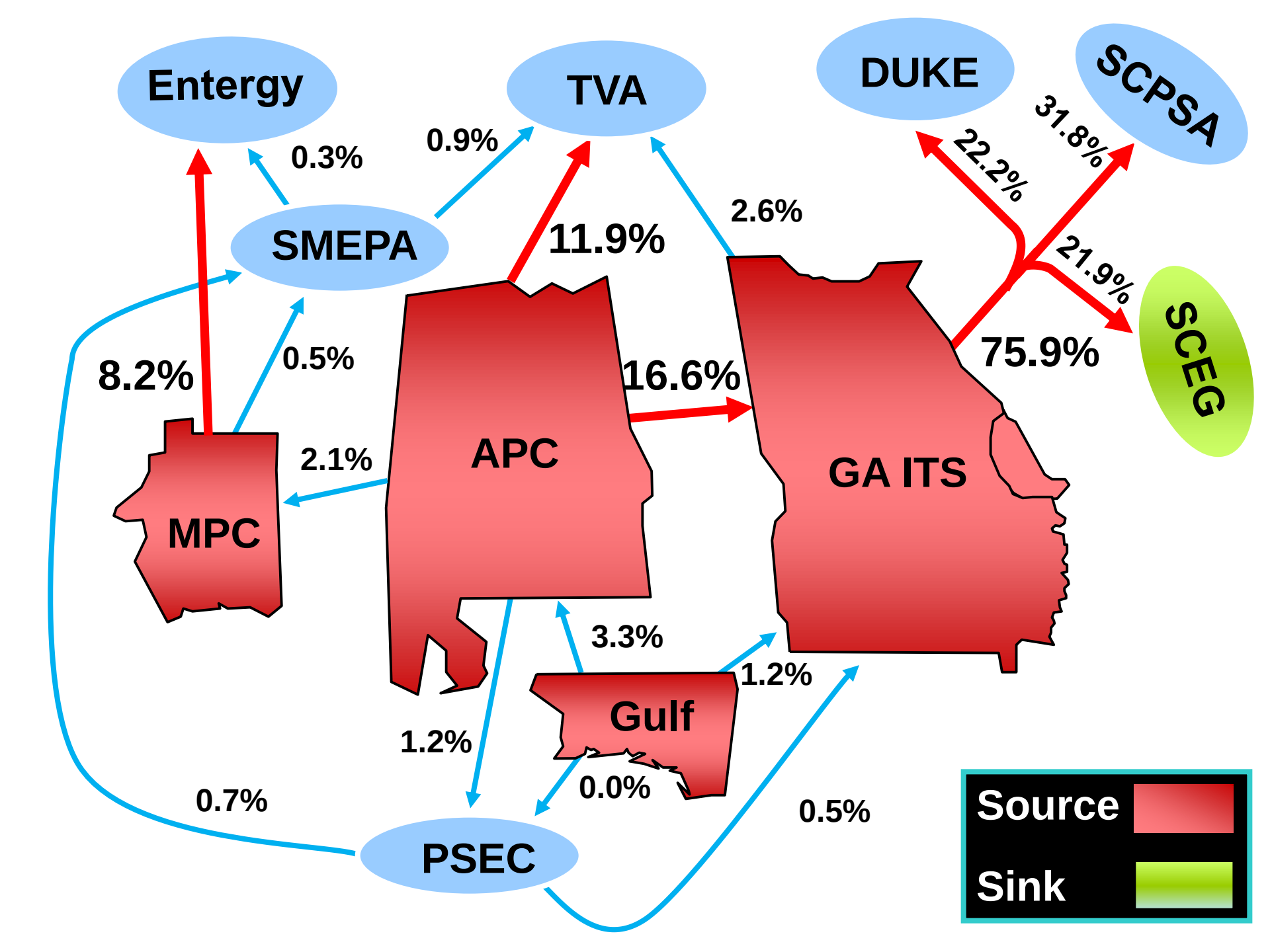
500 MW

Southern to SCE&G Border 500 MW

- **Transfer Type:** Generation to Load (2015 Winter Peak)
- **Source:** Southern Generation
- **Sink:** Uniform load scale in SCE&G

Source

Sink


Entergy
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Gulf
PSEC
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22.2%
31.8%
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21.9%
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0.5%
75.9%
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3.3%
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1.2%
0.0%
0.7%
0.5%
Source
Sink

Southern to SCE&G Border 500 MW

Transmission System Impacts

- **Thermal Constraints Identified:**
  - One (1) 115 kV T.L.

Total Cost (2013$) = $9,000,000

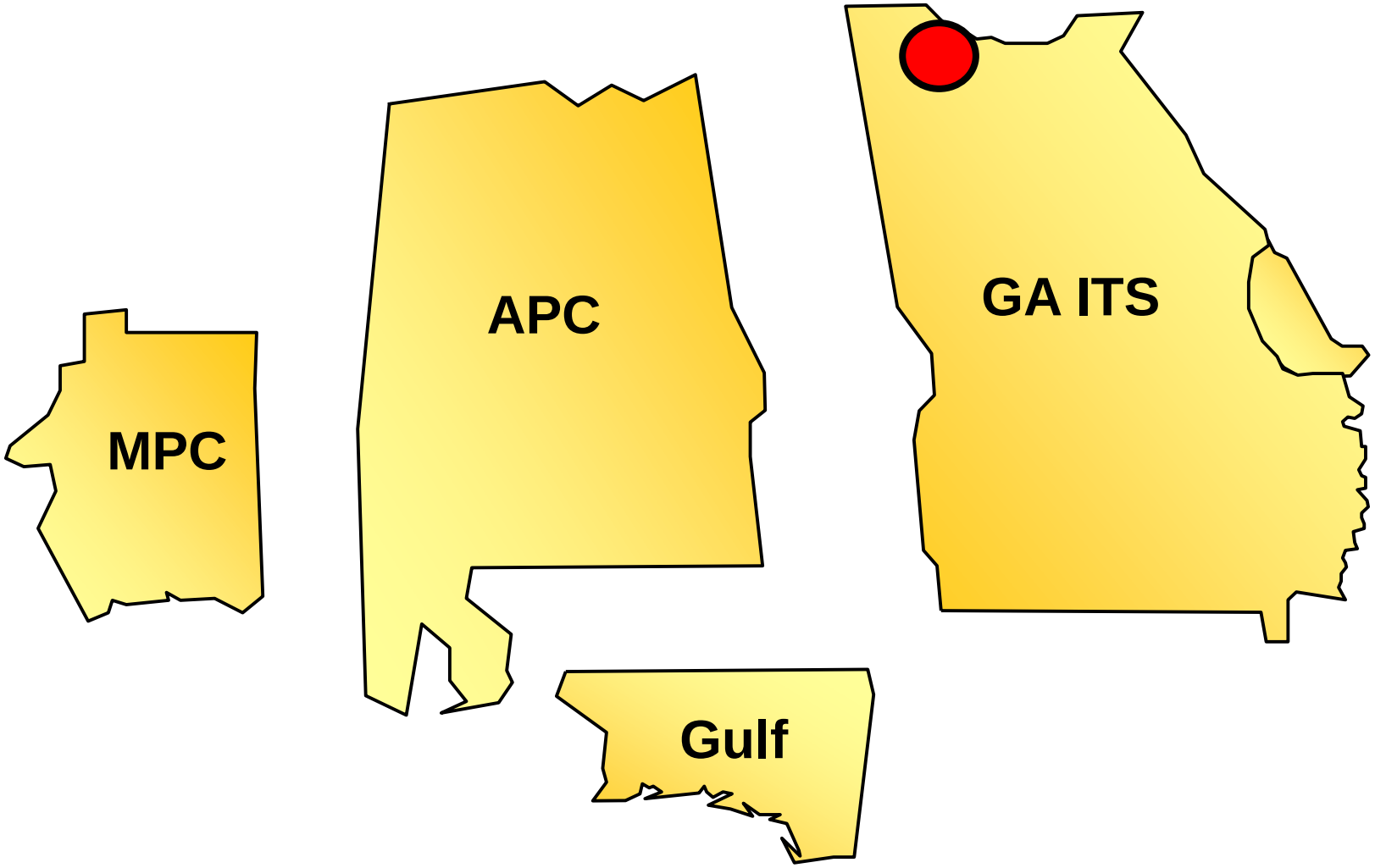
Southern to SCE&G Border 500 MW

Significant Constraints – Pass 0

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
Chatsworth – Coosawattee 115 kV TL	137	91.9	102.4

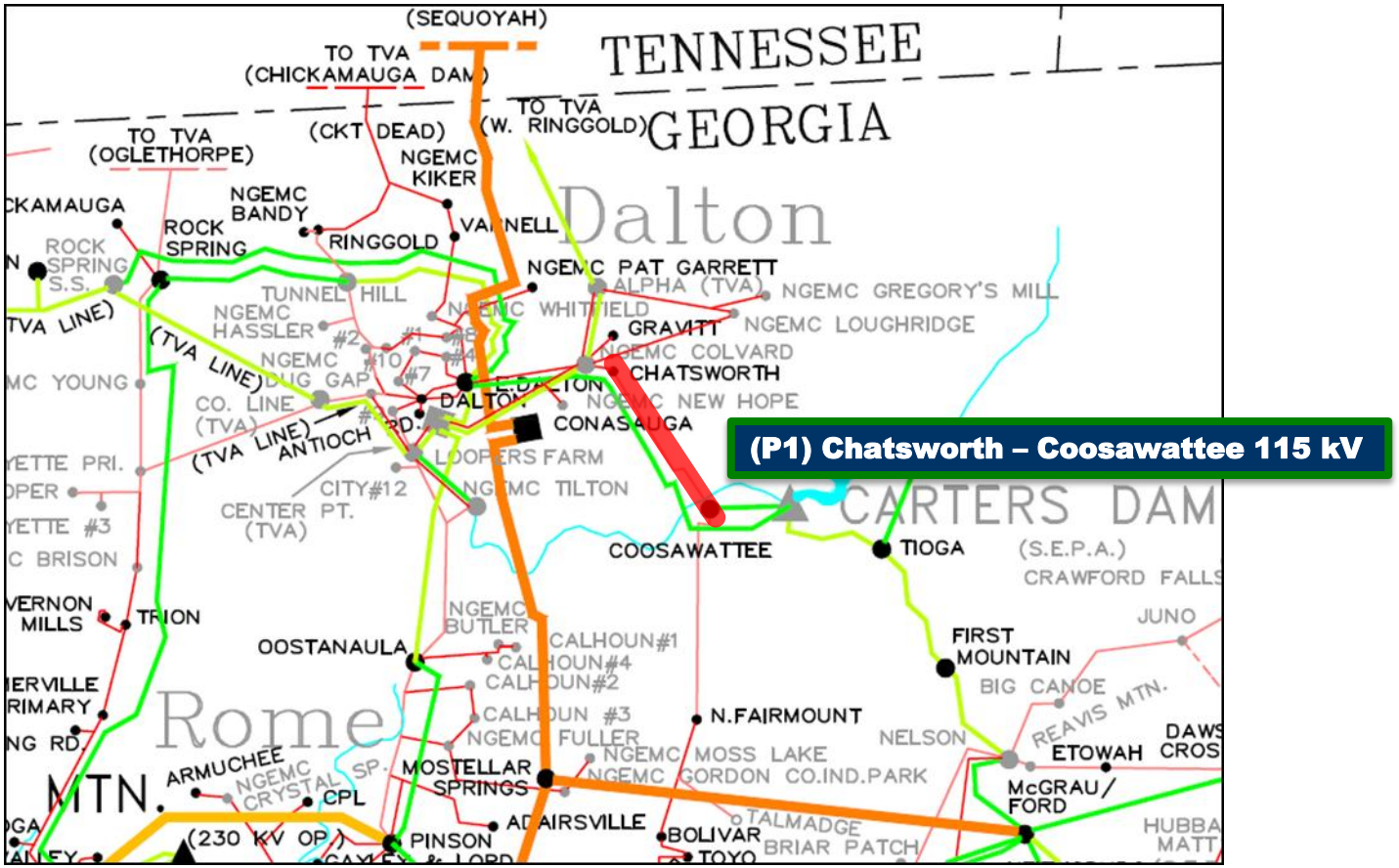
Southern to SCE&G Border 500 MW

Significant Constraints – Pass 0



Southern to SCE&G Border 500 MW

Significant Constraints – Pass 0



Southern to SCE&G Border 500 MW

Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	**Chatsworth – Coosawattee 115 kV T.L.** - Reconductor approximately 12 miles of 336 ACSR 115 kV transmission line with 795 ACSR at 100°C.	**$9,000,000**

Total Cost (2013$) = $9,000,000

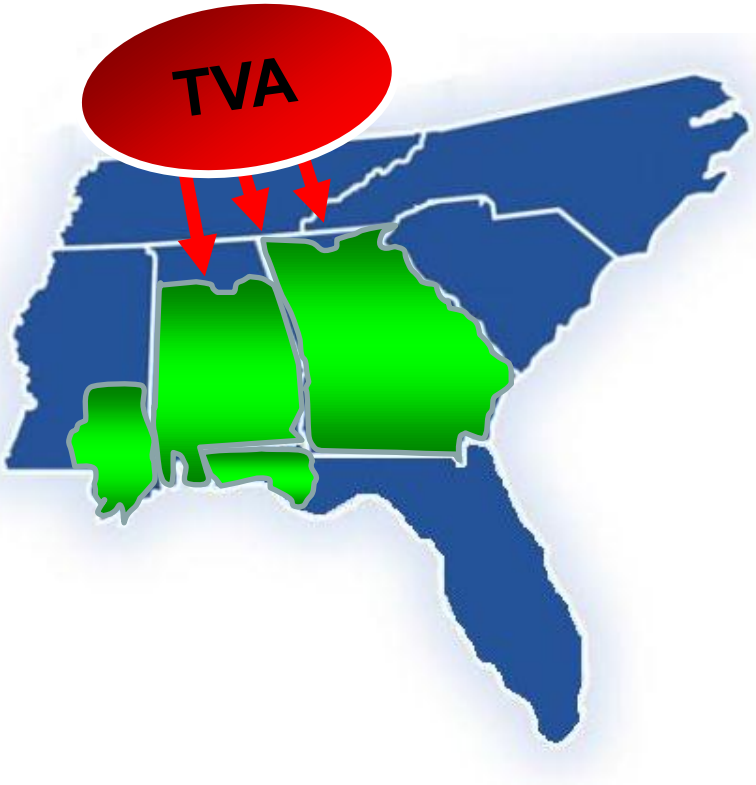
TVA Border to Southern

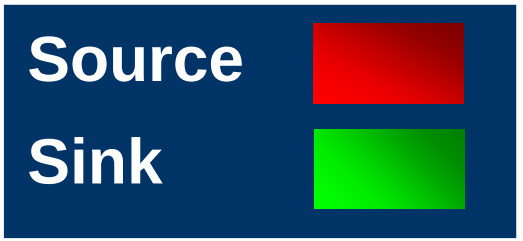
1500 MW

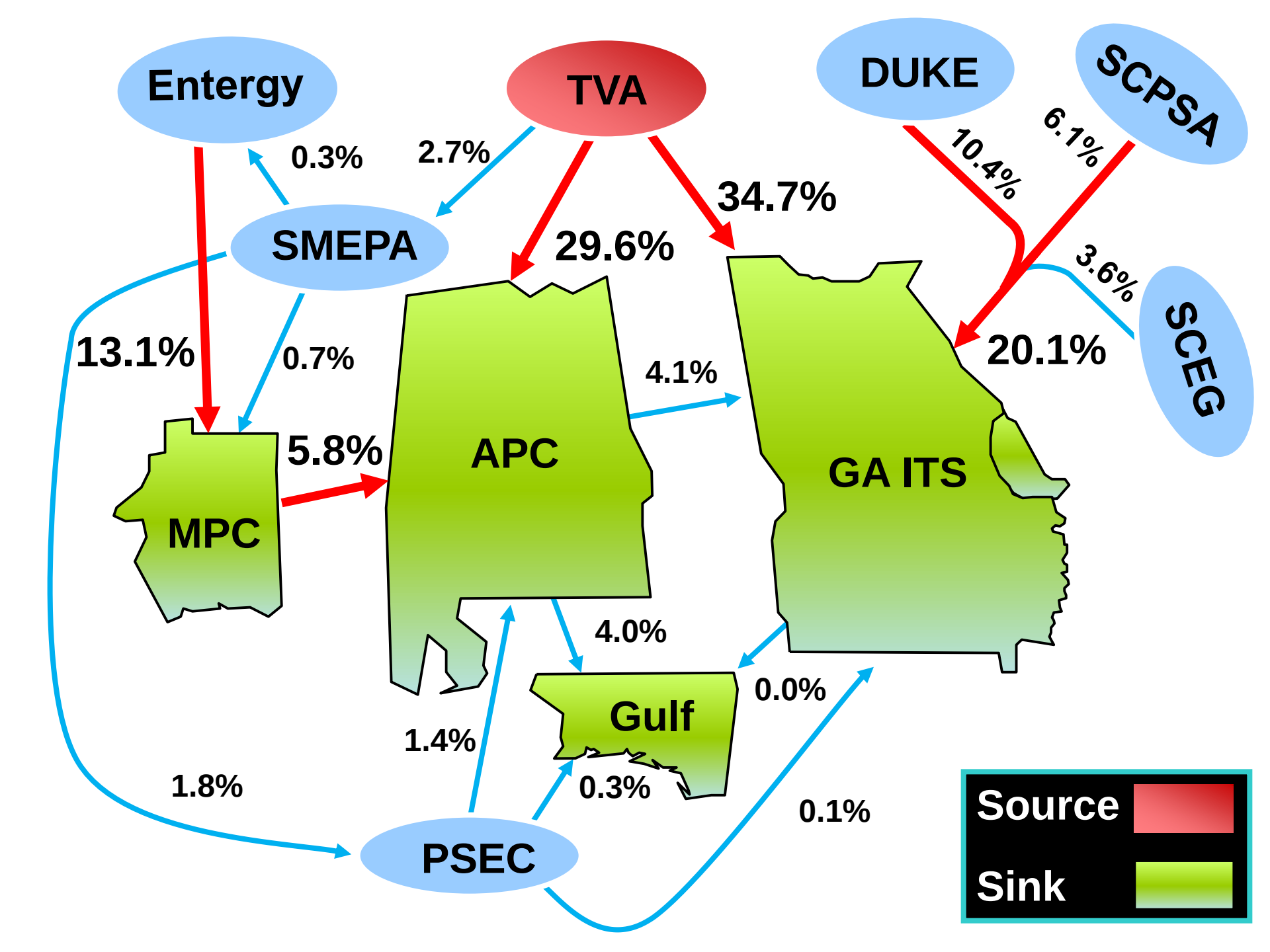
(Spring Valley)

TVA Border to Southern 1500 MW (Spring Valley)

- **Transfer Type:** Load to Generation (2017 Spring Valley)
- **Source:** Uniform load scale in TVA
- **Sink:** Southern Generation






Entergy
TVA
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0.3%
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6.1%
29.6%
3.6%
13.1%
0.7%
20.1%
4.1%
5.8%
4.0%
0.0%
1.4%
0.3%
1.8%
0.1%
Source
Sink

TVA Border to Southern 1500 MW (Spring Valley)

Transmission System Impacts

- **Thermal Constraints Identified:**
  - None

Total Cost (2013$) = $0

2013 SERTP

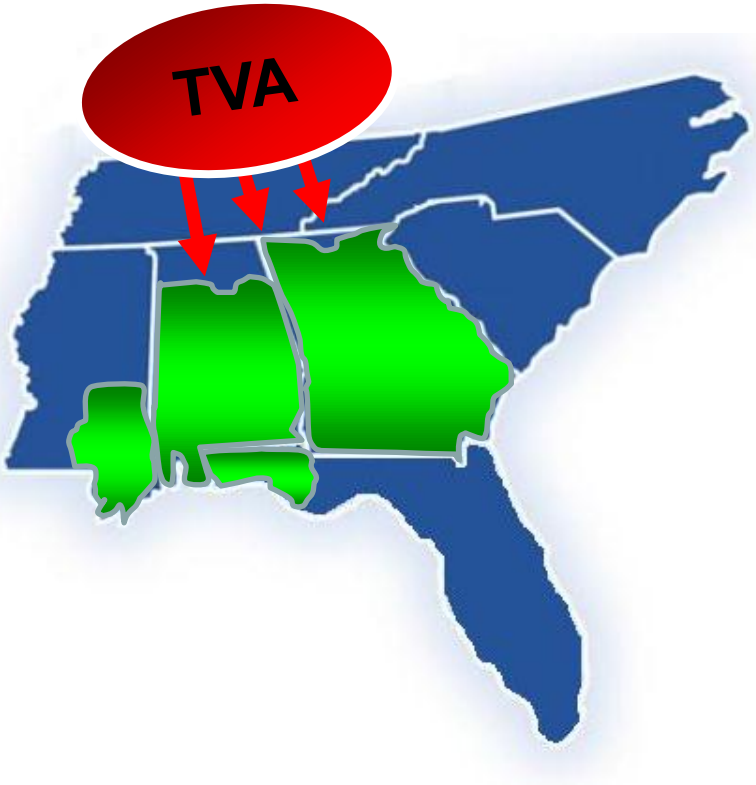
TVA Border to Southern

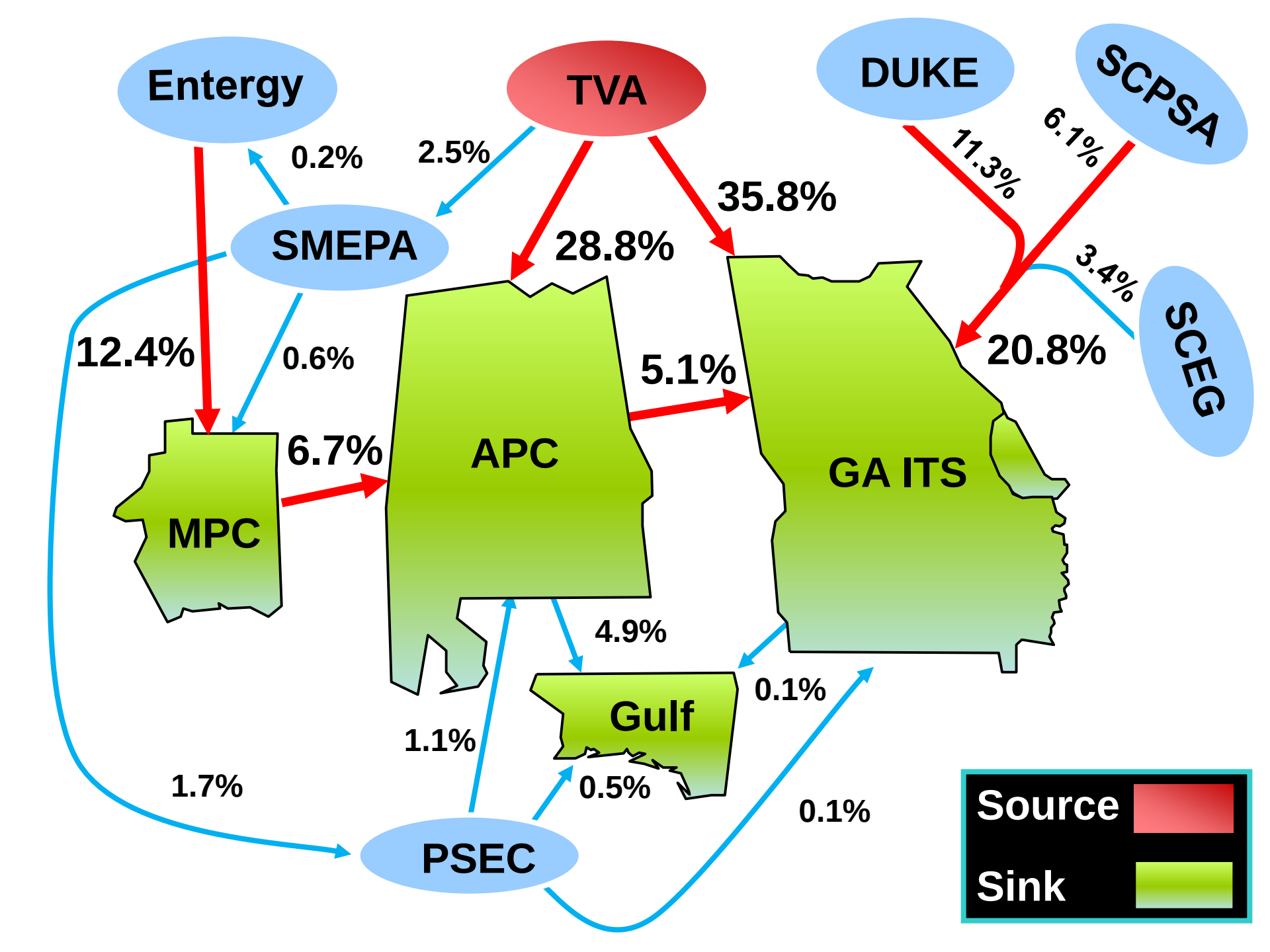
1500 MW

(Summer Peak)

TVA Border to Southern 1500 MW (Summer Peak)

- **Transfer Type:** Load to Generation (2017 Summer Peak)
- **Source:** Uniform load scale in TVA
- **Sink:** Southern Generation

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Gulf
PSEC
0.2%
2.5%
35.8%
11.3%
6.1%
28.8%
3.4%
12.4%
0.6%
20.8%
5.1%
6.7%
4.9%
0.1%
1.1%
1.7%
0.5%
0.1%
Source
Sink

TVA Border to Southern 1500 MW (Summer Peak)

Transmission System Impacts

- **Thermal Constraints Identified:**
  - One (1) 500 kV T.L.
  - Five (5) 230 kV T.L.
  - Two (2) 161 kV T.L.

Total Cost (2013$) = $137,900,000

TVA Border to Southern 1500 MW (Summer Peak)

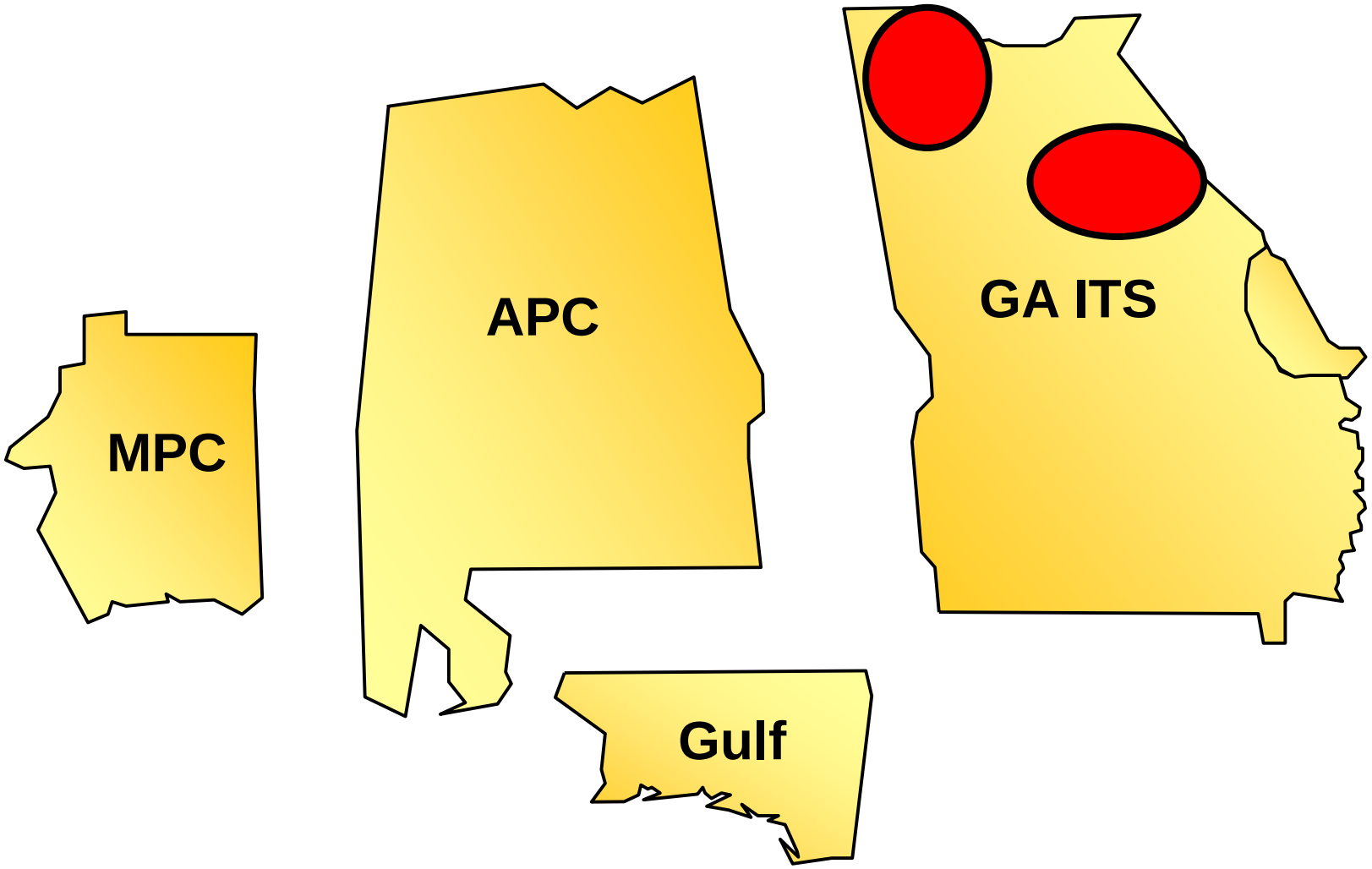
Significant Constraints – Pass 0

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
Conasauga – Bradley TN 500 kV TL	2598	88.0	104.2 (1)
South Hall – Candler 230 kV TL	509	93.8	103.0
Pinson – Oostanaula 230 kV TL	664	85.5	101.2
Bio – Vanna 230 kV TL	433	96.0	101.1
Lexington – Russell 230 kV TL	596	95.1	100.4

(1) The limiting element of this tie-line constraint is located within TVA

TVA Border to Southern
1500 MW (Summer Peak)

Significant Constraints – Pass 0



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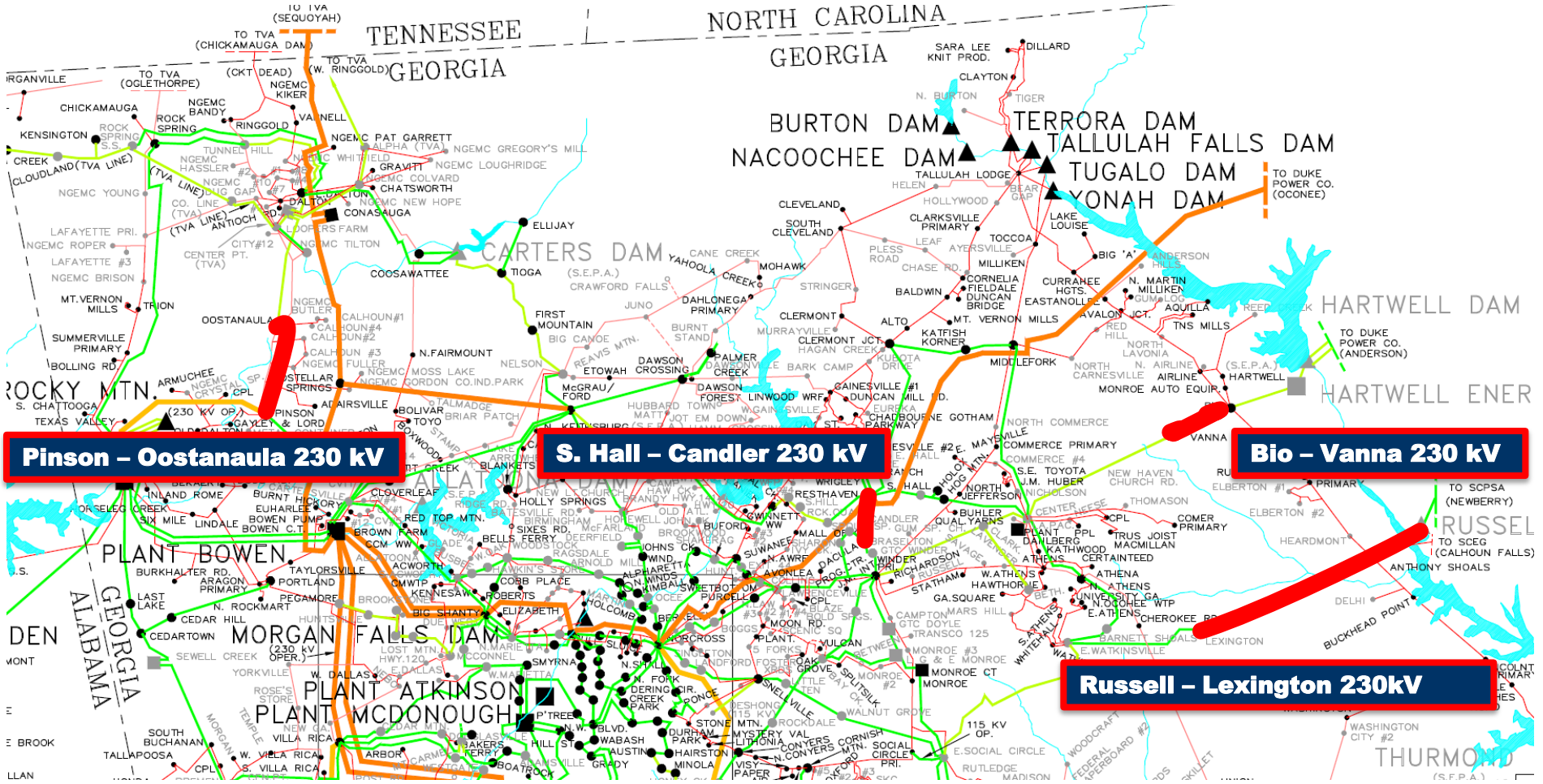
TVA Border to Southern 1500 MW (Summer Peak)

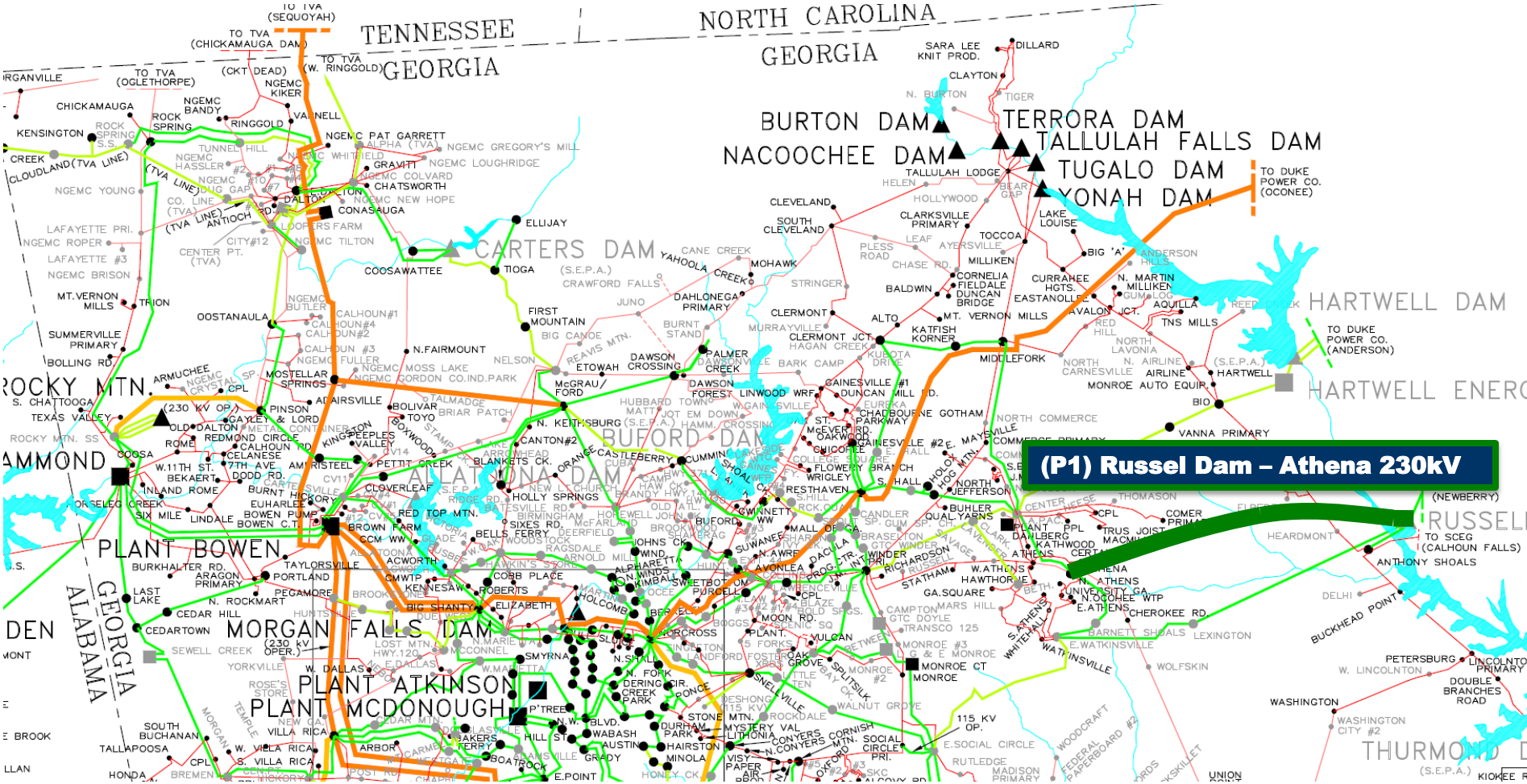
Significant Constraints – Pass 0



Southeastern Regional TRANSMISSION PLANNING

TVA Border to Southern 1500 MW (Summer Peak)

Proposed Enhancements – Pass 1



TVA Border to Southern 1500 MW (Summer Peak)

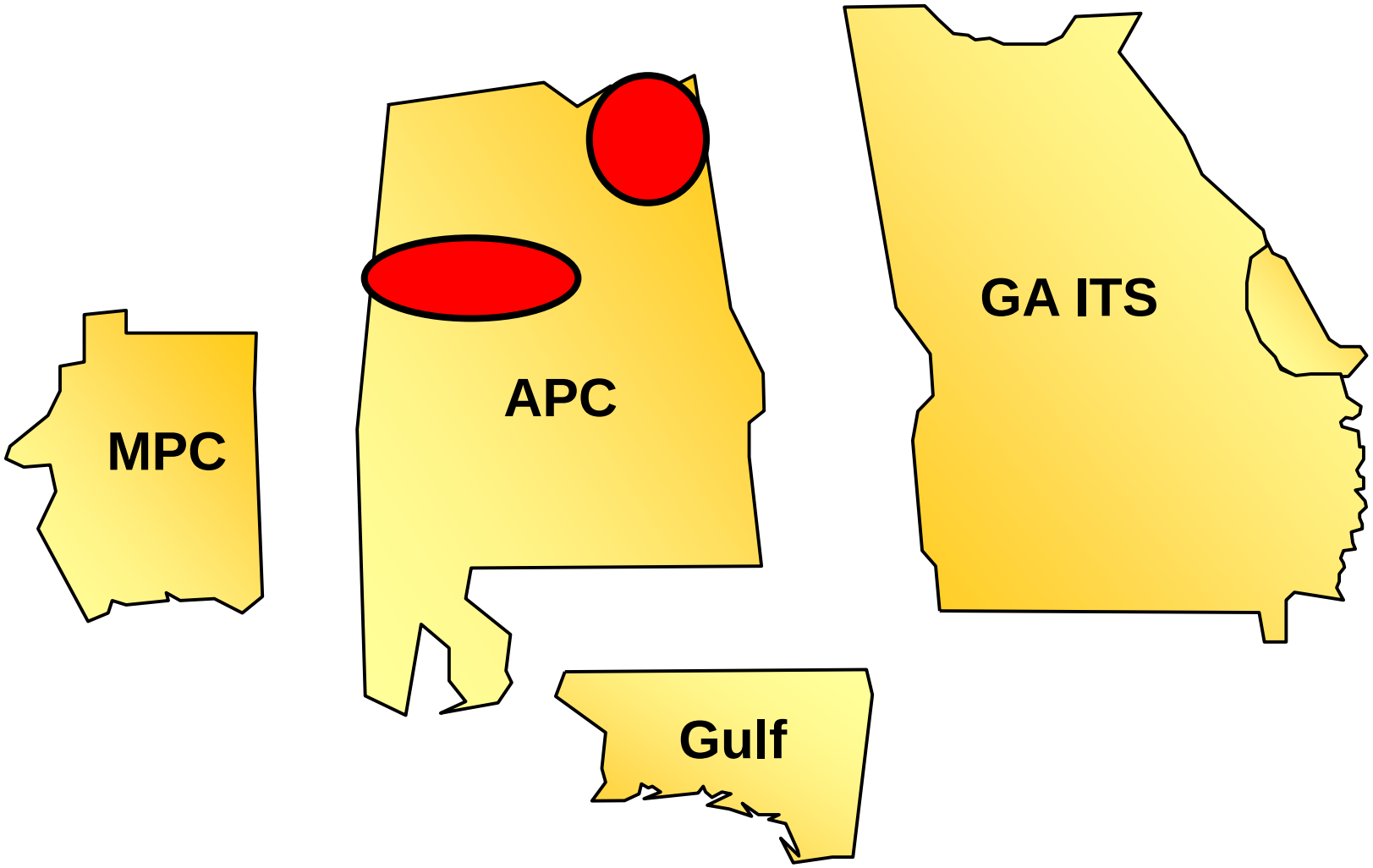
Significant Constraints – Pass 1

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
Fayette – Gorgas 161 kV TL	193	103.2 (1)	126.8
Attalla – Albertville 161 kV TL	193	96.8	122.7
Clay – Argo 230 kV TL	602	87.9	108.7
Leeds TS – Argo 230 kV TL	602	84.5	105.3

(1) A current operating procedure is sufficient to alleviate this identified constraint without the addition of the proposed transfer. However, the additional transfer exacerbates the loading on this transmission facility such that the operating procedure becomes insufficient.

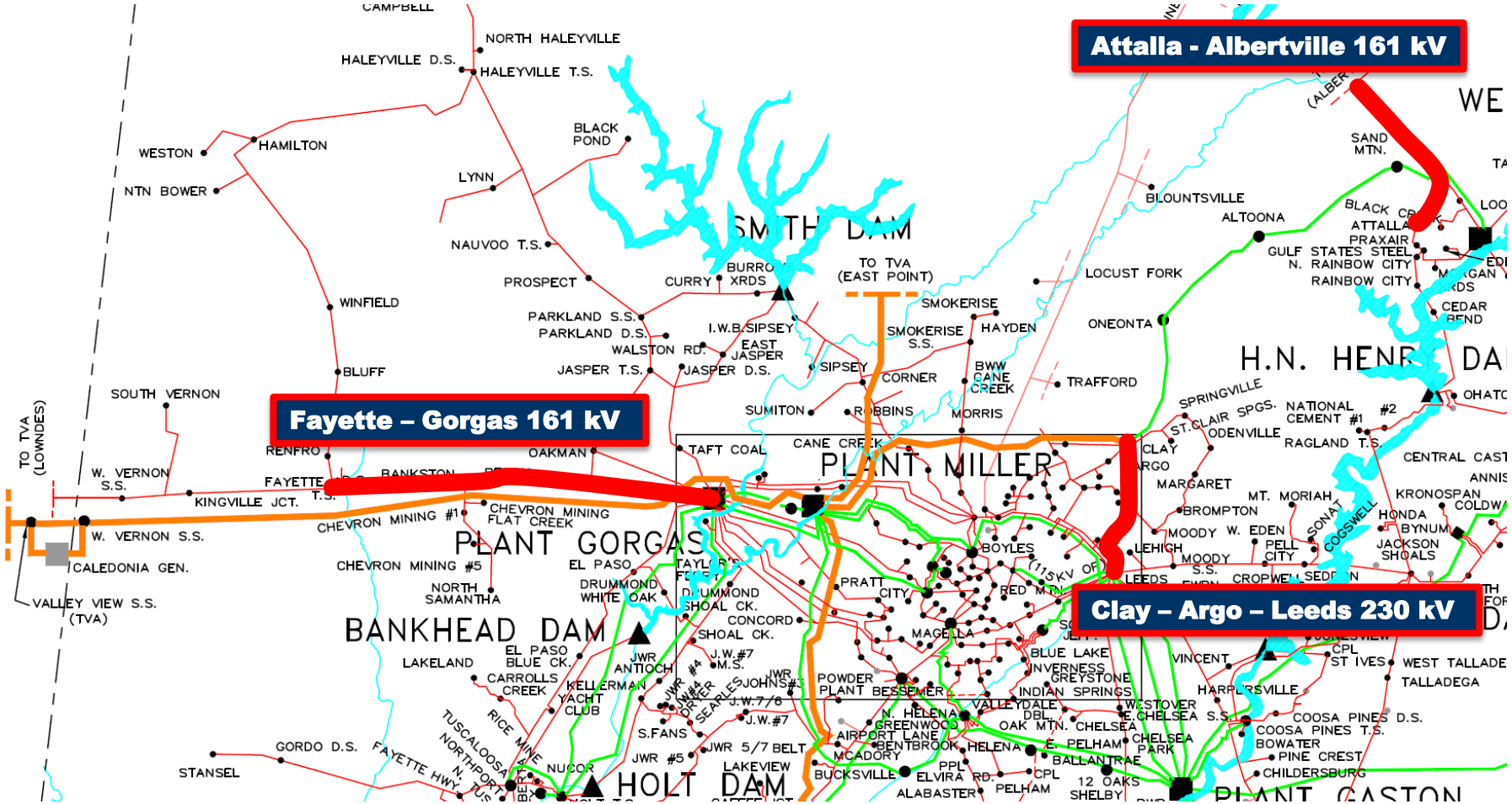
TVA Border to Southern
1500 MW (Summer Peak)

Significant Constraints – Pass 1



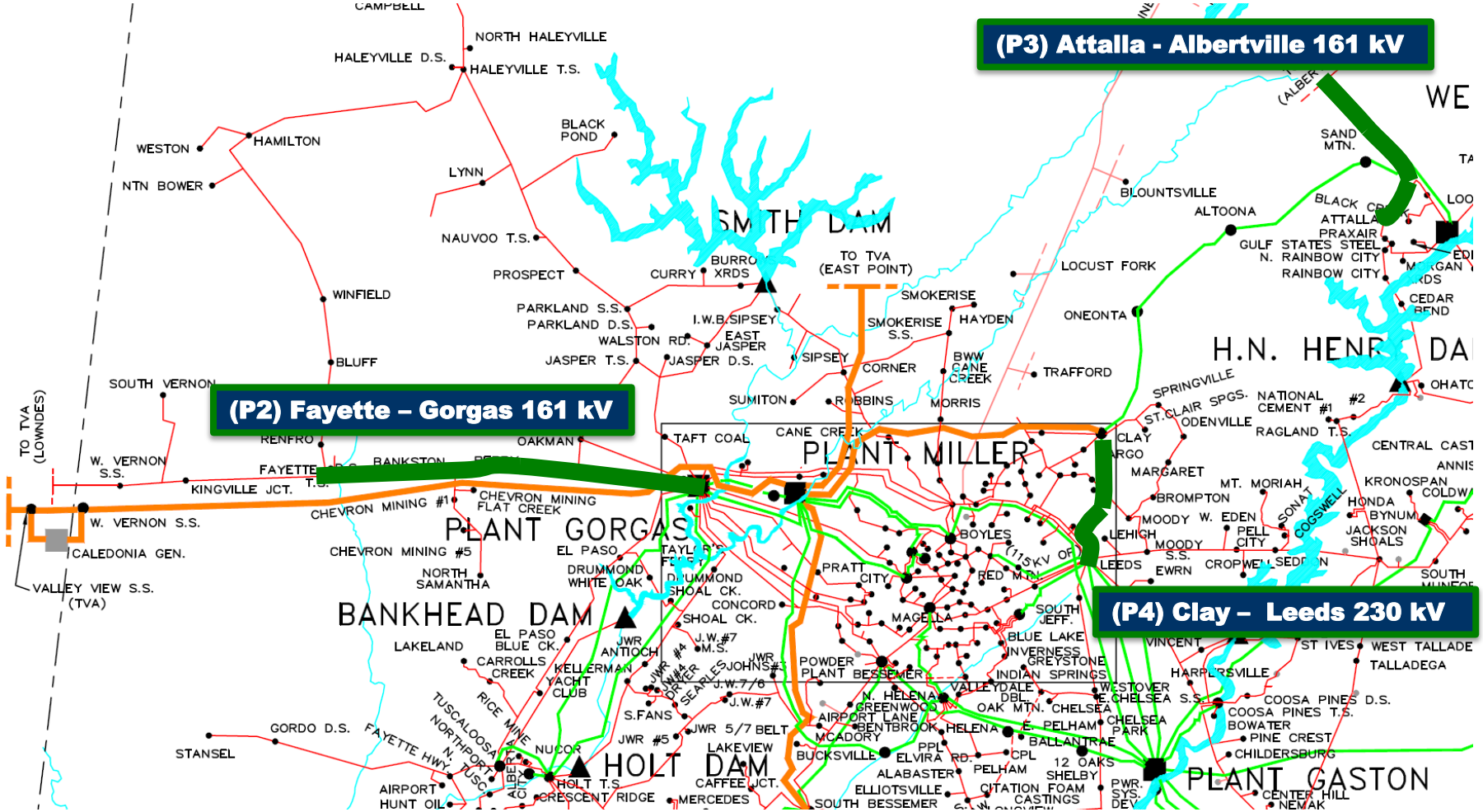
TVA Border to Southern 1500 MW (Summer Peak)

Significant Constraints – Pass 1



TVA Border to Southern 1500 MW (Summer Peak)

Proposed Enhancements – Pass 2



TVA Border to Southern 1500 MW (Summer Peak)

Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	**Russell Dam – Athena 230 kV T.L.** - 45 miles of new 230 kV Line - Bundled (2) 1351 ACSR at 100°C	**$60,000,000**
P2	**Fayette – Gorgas 161 kV Line** - Rebuild 38.8 miles with 1351 ACSR at 100°C	**$36,300,000**
P3	**Attalla – Albertville 161 kV Line** - Reconductor 19.6 miles with 1351 ACSR at 100°C	**$20,600,000**
P4	**Clay TS – Leeds TS 230 kV Line** - Reconductor 17.3 miles with bundled (2) 1351 ACSR at 100°C	**$21,000,000**

Total Cost (2013$) = $137,900,000

Southern

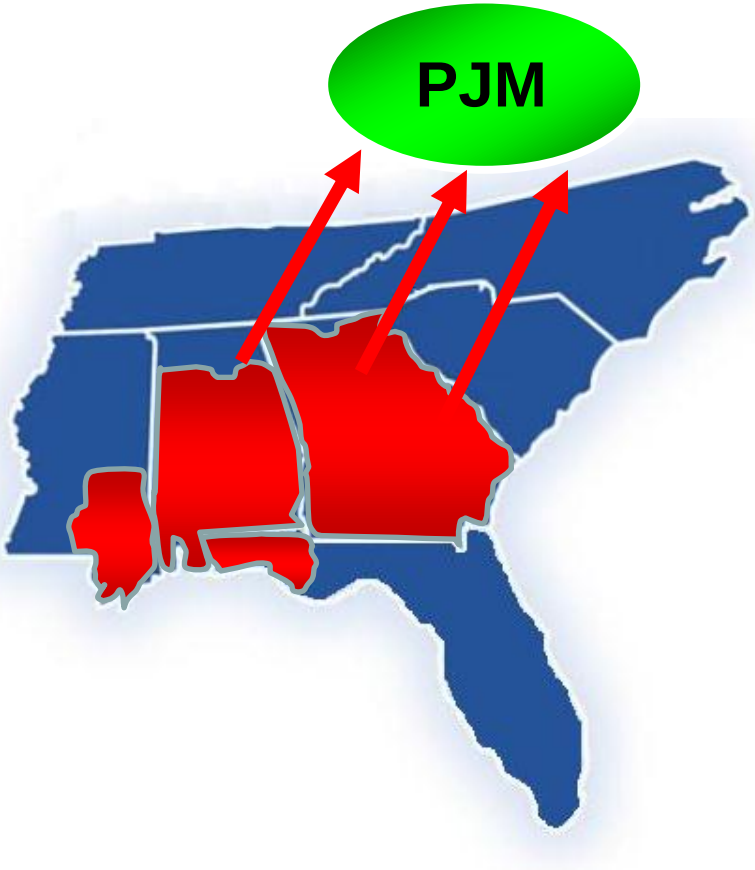
to

PJM

1000 MW

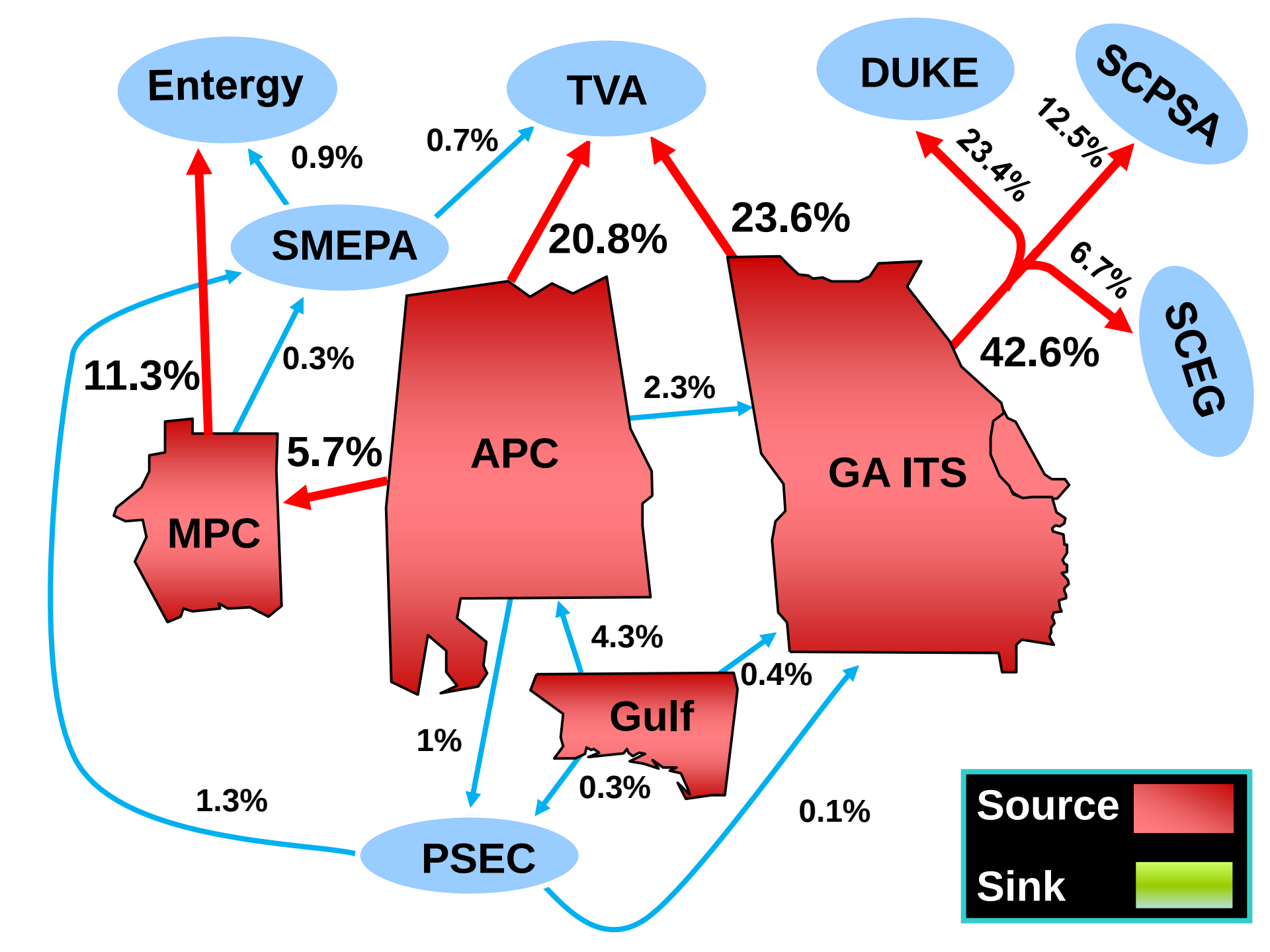
Southern to PJM
1000 MW

- **Transfer Type:** Generation to Load (2023 Summer Peak)
- **Source:** Southern Generation
- **Sink:** Uniform load scale in PJM



Source

Sink


Entergy
TVA
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SCEG
SMEPA
PSEC
MPC
APC
GA ITS
Gulf
0.9%
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6.7%
20.8%
23.6%
42.6%
11.3%
0.3%
2.3%
5.7%
4.3%
0.4%
1%
0.3%
1.3%
0.1%
Source
Sink

Southern to PJM 1000 MW

Transmission System Impacts

- **Thermal Constraints Identified:**
  - One (1) 230 kV T.L.
  - One (1) 115 kV T.L.

Total Cost (2013$) = $920,000

Southern to PJM 1000 MW

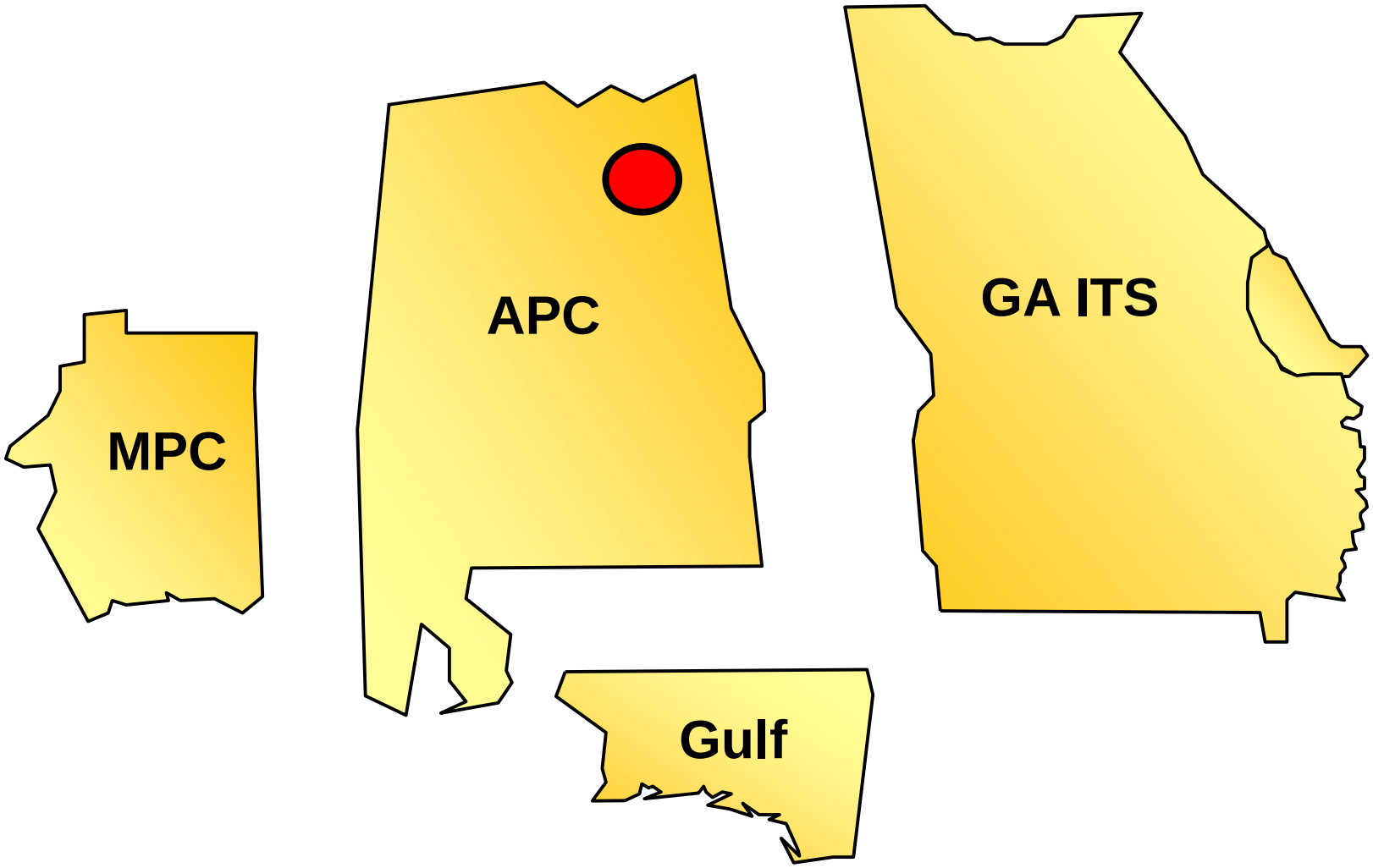
Significant Constraints – Pass 0

Limiting Elements	Rating (MVA)	Thermal Loading (%)	
		Without Request	With Request
Vogtle – SRS 230 kV TL	137	97.8	104.5 (1)
Morgan Crossroads – GS Steel 115 kV TL	112	87.6	100.4

(1) The limiting element of this tie-line constraint is located within SCE&G

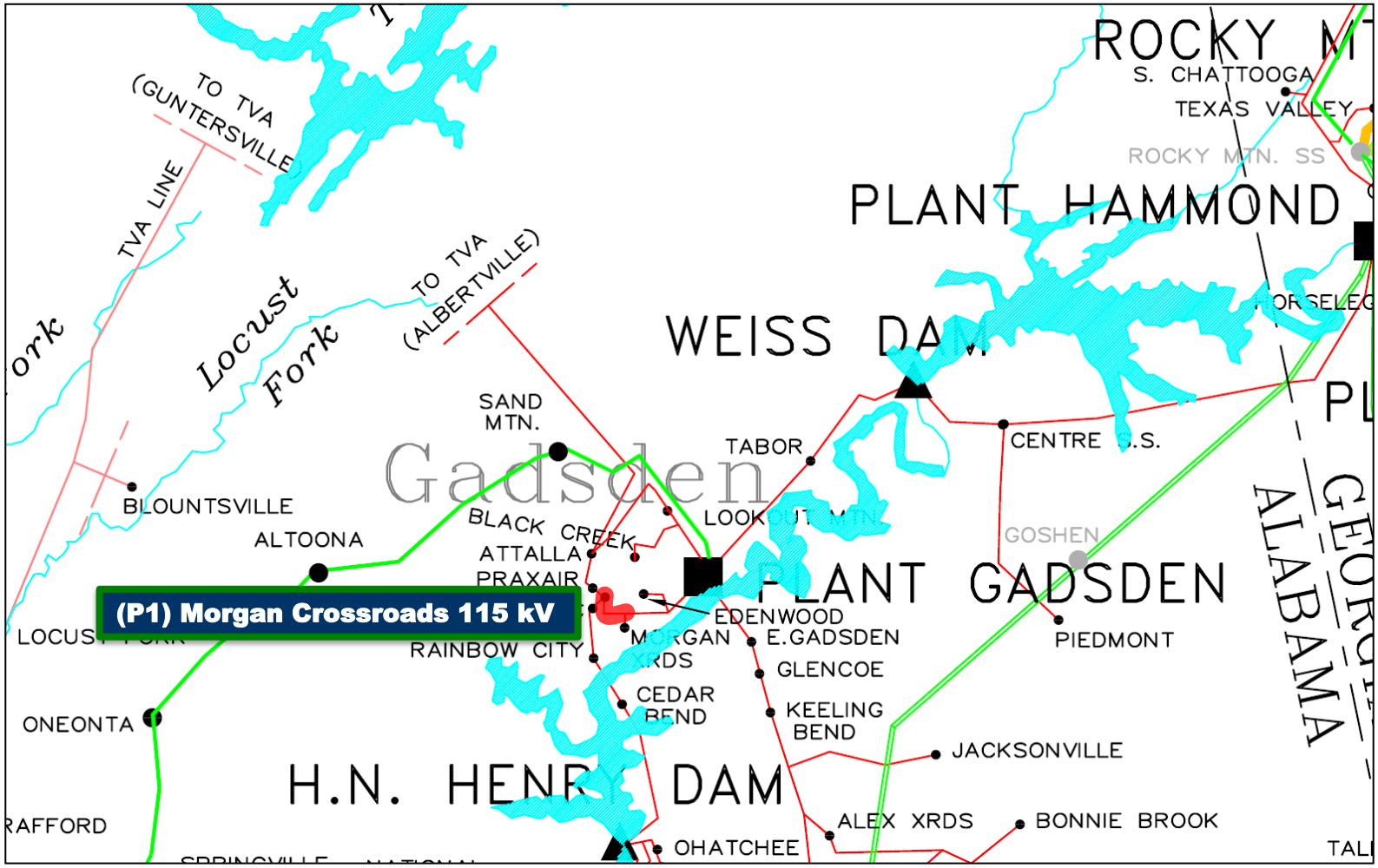
Southern to PJM 1000 MW

Significant Constraints – Pass 0



Southern to PJM 1000 MW

Significant Constraints – Pass 0



Southern to PJM 1000 MW

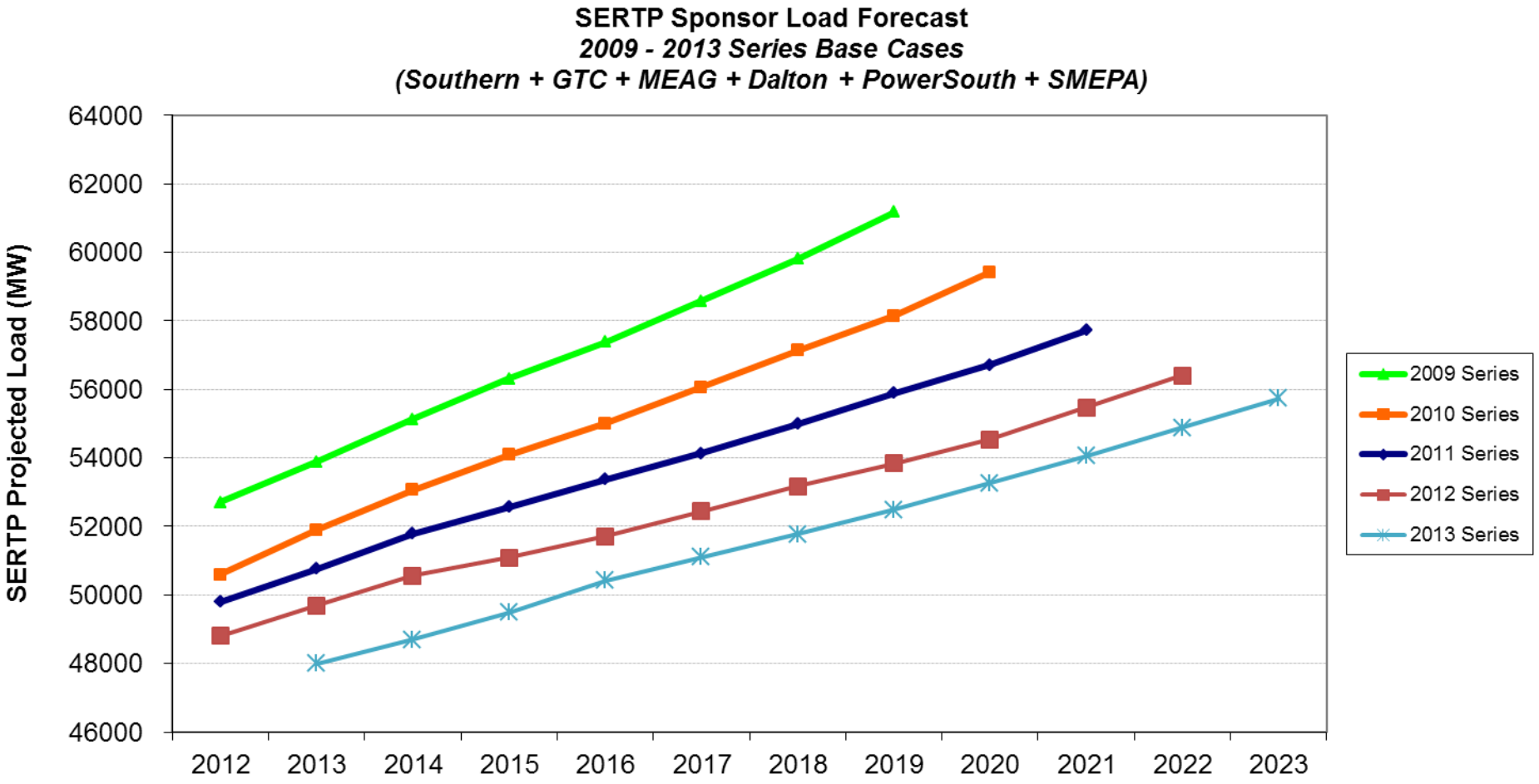
Projects Identified

Item	Proposed Enhancements	Cost ($)
P1	**Morgan Crossroads – GS Steel 115 kV T.L.** - Upgrade 2.5 miles from 75°C to 100°C	**$920,000**

Total Cost (2013$) = $920,000

Modeling Assumptions Update

Load Forecast



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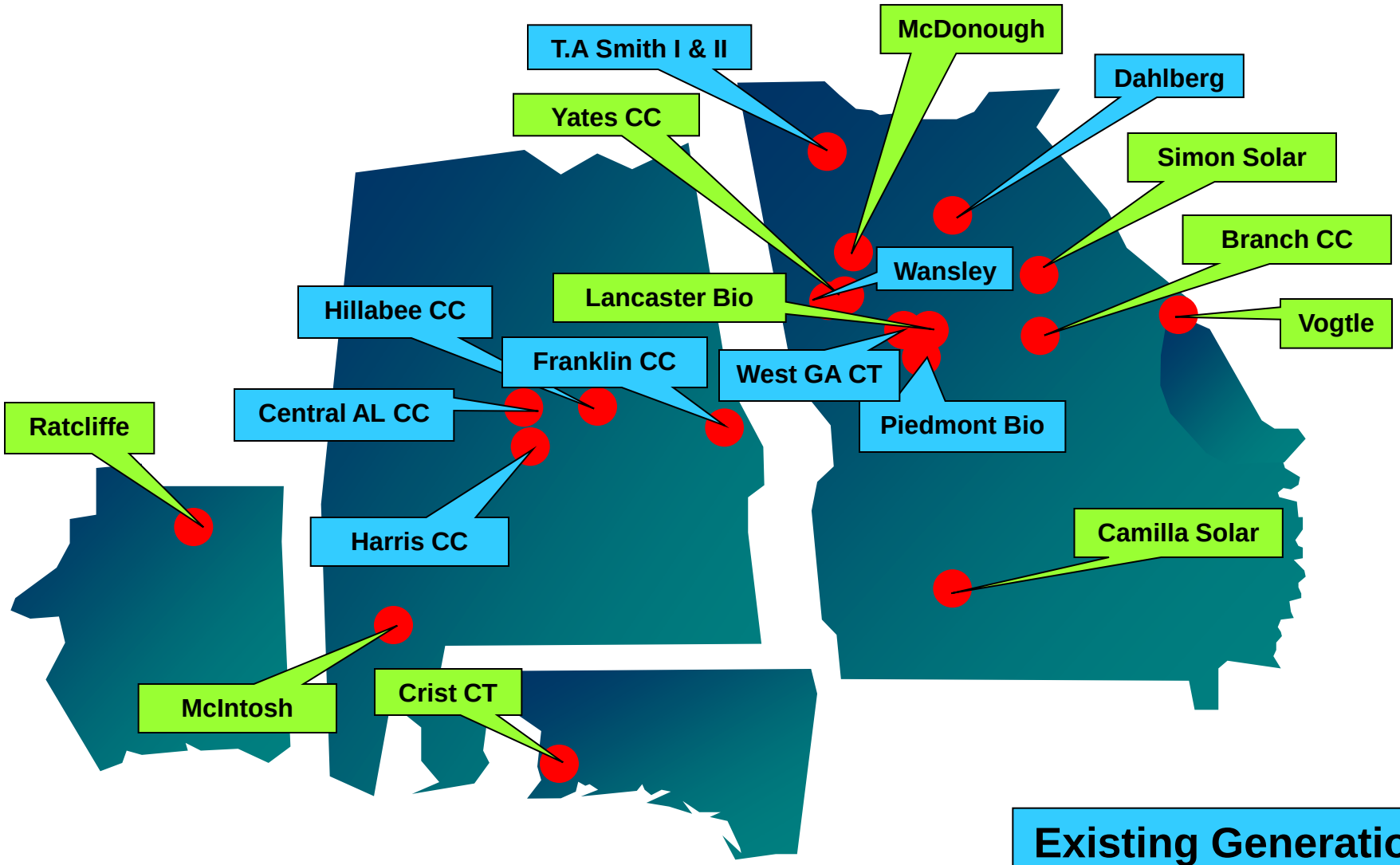
2014 Regional Generation Assumptions



Southeastern Regional TRANSMISSION PLANNING

2014 Regional Generation Assumptions

The following tables depict changes in the generation assumptions for the 2014 Transmission Expansion Planning Process[1]

SOUTHERN

Site	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
McDonough CC 6	841	841	841	841	841	841	841	841	841	841	841
Central Alabama CC	885	885	885	885	885	885	885	885	885	0	0
Piedmont Biomass	50	50	50	50	50	50	50	50	50	50	50
Vogtle 1	538	538	538	538	538	538	538	538	538	538	538
Baconton CT	0	--	--	--	--	--	--	--	--	--	--
Dahlberg CT	292	367	367	367	367	367	367	367	367	367	367
Ratcliffe IGCC	510	510	510	510	510	510	510	510	510	510	510
Branch 2	0	--	--	--	--	--	--	--	--	--	--
Branch 1	266	0	--	--	--	--	--	--	--	--	--

[1]The years shown in the following tables represent Summer Peak conditions

2014 Regional Generation Assumptions

SOUTHERN (Cont.)

Site	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Branch 3-4	1016	0	--	--	--	--	--	--	--	--	--
McManus 1-2	122	0	--	--	--	--	--	--	--	--	--
Yates 1-5	470	0	--	--	--	--	--	--	--	--	--
Yates 6-7	572	642	642	642	642	642	642	642	642	642	642
Vogtle 2	584	540	540	540	540	540	540	540	540	540	540
West Georgia CT	--	298	298	298	298	298	298	298	298	298	298
Kraft 1-4	333	333	0	--	--	--	--	--	--	--	--
Franklin 2 CC	--	625	0	--	--	--	--	--	--	--	--
Simon Solar	--	30	30	30	30	30	30	30	30	30	30
Camilla Solar	--	16	16	16	16	16	16	16	16	16	16
Branch CC	--	--	--	--	--	--	--	--	--	--	940

2014 Regional Generation Assumptions

SOUTHERN (Cont.)

Site	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Gaston 1-4	411	465	465	465	465	465	465	465	465	465	465
Hammond 1	89	89	110	110	110	110	110	110	110	110	110
Hammond 3	89	89	110	110	110	110	110	110	110	110	110
Harris CC 1	--	--	625	625	625	625	625	625	625	625	625
Wansley CC 6	561	561	561	0	--	--	--	--	--	--	--
Vogtle 3	--	--	--	--	504	504	504	504	504	504	504
Vogtle 4	--	--	--	--	--	504	504	504	504	504	504
Harris CC 2	628	628	628	628	628	0	--	--	--	--	--
Calhoun CT 1-4	632	632	632	632	632	632	632	632	632	0	0
Crist CT	--	--	--	--	--	--	--	--	--	300	300
Yates CC	--	--	--	--	--	--	--	--	--	940	940

2014 Regional Generation Assumptions

GTC

Site	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Tiger Creek CT	300	300	300	300	300	300	300	300	300	300	300
Effingham CC	0	--	--	--	--	--	--	--	--	--	--
Lindsay Hill CC	300	300	0	0	0	0	0	150	150	150	150
Franklin CC 2	625	0	625	625	625	625	625	375	375	375	375
Dahlberg CT	75	262	450	450	450	450	450	450	450	450	450
Branch	0	--	--	--	--	--	--	--	--	--	--
Hammond 2	0	--	--	--	--	--	--	--	--	--	--
Gaston 1&2	104	0	--	--	--	--	--	--	--	--	--
Santa Rosa	225	0	--	--	--	--	--	--	--	--	--
McManus CT	30	0	--	--	--	--	--	--	--	--	--
Mitchell	38	0	--	--	--	--	--	--	--	--	--

2014 Regional Generation Assumptions

GTC (Cont.)

Site	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Scherer 3	280	132	132	132	132	132	56	56	56	56	56
Wilson 5 CT	21	0	--	--	--	--	--	--	--	--	--
Yates	244	0	--	--	--	--	--	--	--	--	--
Franklin CC 3	620	620	620	620	620	620	620	620	620	620	620
Warthen CT	552	552	552	552	552	552	552	552	552	552	552
Hillabee CC	--	--	149	149	149	149	149	149	149	149	149
T.A. Smith I CC	0	0	620	620	620	620	620	620	620	620	620
T.A. Smith II CC	0	0	620	620	620	620	620	620	620	620	620
Wansley CC 6	561	561	561	561	561	561	561	561	561	561	561
Vogtle 3	--	--	--	--	330	330	330	330	330	330	330
Vogtle 4	--	--	--	--	--	330	330	330	330	330	330
Washington County	--	--	--	--	--	0	0	0	0	0	0

2014 Regional Generation Assumptions

MEAG

Site	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Vogtle 1	248	248	248	248	248	248	248	248	248	248	248
Vogtle 2	204	248	248	248	248	248	248	248	248	248	248
Vogtle 3	--	--	--	--	250	250	250	250	250	250	250
Vogtle 4	--	--	--	--	--	250	250	250	250	250	250

Dalton

Site	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Vogtle 3	--	--	--	--	16	16	16	16	16	16	16
Vogtle 4	--	--	--	--	--	16	16	16	16	16	16

2014 Regional Generation Assumptions

PowerSouth

Site	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
McIntosh CC 6	--	--	--	--	--	--	--	328	328	328	328

SMEPA:

Site	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Ratcliffe IGCC	--	90	90	90	90	90	90	90	90	90	90

2014 Regional Generation Assumptions

Generation Assumptions for the 2014 Transmission Expansion Planning Process

(Generation within the SERTP based upon PTPs)

Site	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Vogtle	--	--	--	--	103	206	206	206	206	206	206
Lindsay Hill	508	300	92	--	--	--	--	--	--	--	--
Hammond	--	10	10	10	10	10	10	10	10	10	10
Miller	--	100	100	--	--	--	--	--	--	--	--
Harris	584	584	--	--	--	--	--	--	--	--	--
Franklin	535	535	535	535	535	535	535	535	535	535	535
Scherer	1085	1085	1011	1011	1011	1011	1011	1011	1011	1011	1011

FRCC Coordination Update

FRCC Coordination Update

- **Exchanged the latest transmission models for the ten year planning horizon.**
- **Models will be incorporated into subsequent base cases.**

SIRPP Update

Economic Planning Studies

- **Shelby 500 kV (HVDC) to TVA/Southern Company (3500 MW)**
  Study Year: 2018, Shoulder and Summer Peak

- **Sullivan 765 kV (HVDC) to PJM/VACAR (3500 MW)**
  Study Year: 2018, Shoulder and Summer Peak

- **TVA to LG&E/KU (500 MW)**
  Study Year: 2015

Shelby to TVA/Southern 3500 MW

Transmission System Impacts for the SIRPP

- Three (3) 500 kV Lines
- One (1) 500/230 kV XFMR
- Three (3) 230 kV Lines
- One (1) 230/115 kV XFMRs
- Thirteen (13) 161 kV Lines
- One (1) 115 kV Line

Total Cost (2013$) = $400,605,000

Sullivan to PJM/VACAR 3500 MW

Transmission System Impacts for the SIRPP

- Five (5) 230 kV Lines
- One (1) 230/115 kV XFMR
- Eleven (11) 161 kV Lines
- One (1) 115 kV Line
- One (1) 115 kV SS
- One (1) 115/100 kV XFMR
- Two (2) 100 kV Lines

Total Cost (2013$) = $247,610,000

TVA to LG&E/KU 500 MW

Transmission System Impacts for the SIRPP

- None

Total Cost (2013$) = $0

Economic Planning Studies

- **Shelby 500 kV (HVDC) to TVA/Southern Company (3500 MW)**
  Study Year: 2018
- **Sullivan 765 kV (HVDC) to PJM/VACAR (3500 MW)**
  Study Year: 2018
- **TVA to LG&E/KU (700 MW)**
  Study Year: 2016
- **Duke to Santee Cooper (500 MW)**
  Study Year: 2015
- **SOCO to FRCC (500 MW)**
  Study Year: 2015

2013 – 2014 SIRPP

More detailed information concerning these studies is available on the Southeast Inter-Regional Participation Process website at the following link:

http://www.southeastirpp.com/

Upcoming 2014 SERTP Process *

- **1st "RPSG" Meeting**
  - March 2014
  - Select Five Economic Planning Studies
- **Preliminary Expansion Plan Meeting**
  - June 2014
  - Preliminary 10 Year Expansion Plan
- **2nd "RPSG" Meeting**
  - September 2014
  - Preliminary Economic Planning Study Results
- **Annual Transmission Planning Summit**
  - December 2014
  - Ten Year Expansion Plan / 2015 Input Assumptions
  - Final Economic Planning Study Results

*The SERTP expects to initiate the implementation of the Order 1000 regional compliance process in June of 2014. An interim web-conference to discuss the status of compliance process will be held on December 19th, 2013.

Questions?