

Colorado Coordinated Planning Group Colorado Energy Plan Task Force



Public Service Company of Colorado
November 21, 2017

Agenda

- Introductions
- Antitrust Reminder
- Reliability Studies
- Capacity Studies
- Schedule
- Next Steps

Antitrust Reminder

It should be the policy and practice (Policy) of the parties participating in the Colorado Coordinated Planning Group to obey the antitrust laws and avoid all conduct that unreasonably restrains competition. Under this Policy, participants should avoid any conduct or behavior that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition.

Assessment Update



Pueblo Reliability Studies

➤ **Objective:**

- **Ensure there are no system performance or reliability issues due to the retirement of Comanche 1&2 generating units. If necessary, recommend transmission upgrades or other mitigation measures.**

➤ **Types of Analyses:**

- **Steady State, Transient Stability, Flicker**

➤ **Conditions:**

- **Peak, Off-peak**
- **Benchmark**
- **C1 & C2 Out**
- **C1, C2 & C3 Out**

Pueblo Reliability Status (Peak)

- **Benchmarking Complete**
- **Peak Studies Complete**
 - **Steady State:**
 - ▶ **No Performance Issues (Voltage or Loading)**
 - **Transient Stability:**
 - ▶ **Select Disturbances Modeled**
 - ▶ **System Stable**
- **Off-Peak Studies Complete**
- **Short Circuit:**
 - **Preliminary Analysis Performed**
 - **Evaluating Results**
- **Flicker**
 - **ongoing**

Southern Stability Disturbances

➤ Internal

1	Fault at Comanche 345kV, lose Comanche 3 unit
2	Fault at Comanche 345kV, lose Comanche 3 unit & Daniels - Comanche 345kV
3	Fault at Comanche 345kV, lose Comanche - Daniels Park #1
4	Fault at Comanche 345kV, lose Comanche - Daniels Park #2
5	fault at Front Range 230kV, lose all three frontrange units
6	Fault at Baculite Mesa 230kV, lose Baculite Mesa # 1

➤ Consultant

Fault Name	Clearing Time (Cycles)
P1_Cherokee-LaCombe_230	6
P1_Comanche-Boone_230	6
P1_DanielsPark-Comanche_345	6
P1_DanielsPark-MissileSite_230	6
P1_FtStVrain-Isabelle_230	6
P1_Midway-Comanche_230	6
P1_WatertonTx	6
P1_Walsenburg-Gladston_230	6
P1_MissileSite-SmokyHill345	6
P4_Comanche-DanielsPark345+7014_GSU3	25
P4_Comanche-DanielsPark345+7012_T4	25
P4_DanielsPark-Comanche+7032_T4	25
P4_DanielsPark-Waterton+5102_JFuller230	25
P4_Midway-Boone+5128_T1	25
P4_Boone-Comanche+5337_Lamar	25
P7_Comanche-DanielsPark345_1+2	6

Capacity Studies



Capacity Studies

- **Objective:**

- Evaluate potential for additional generation to meet needs identified from ERP / CEP.

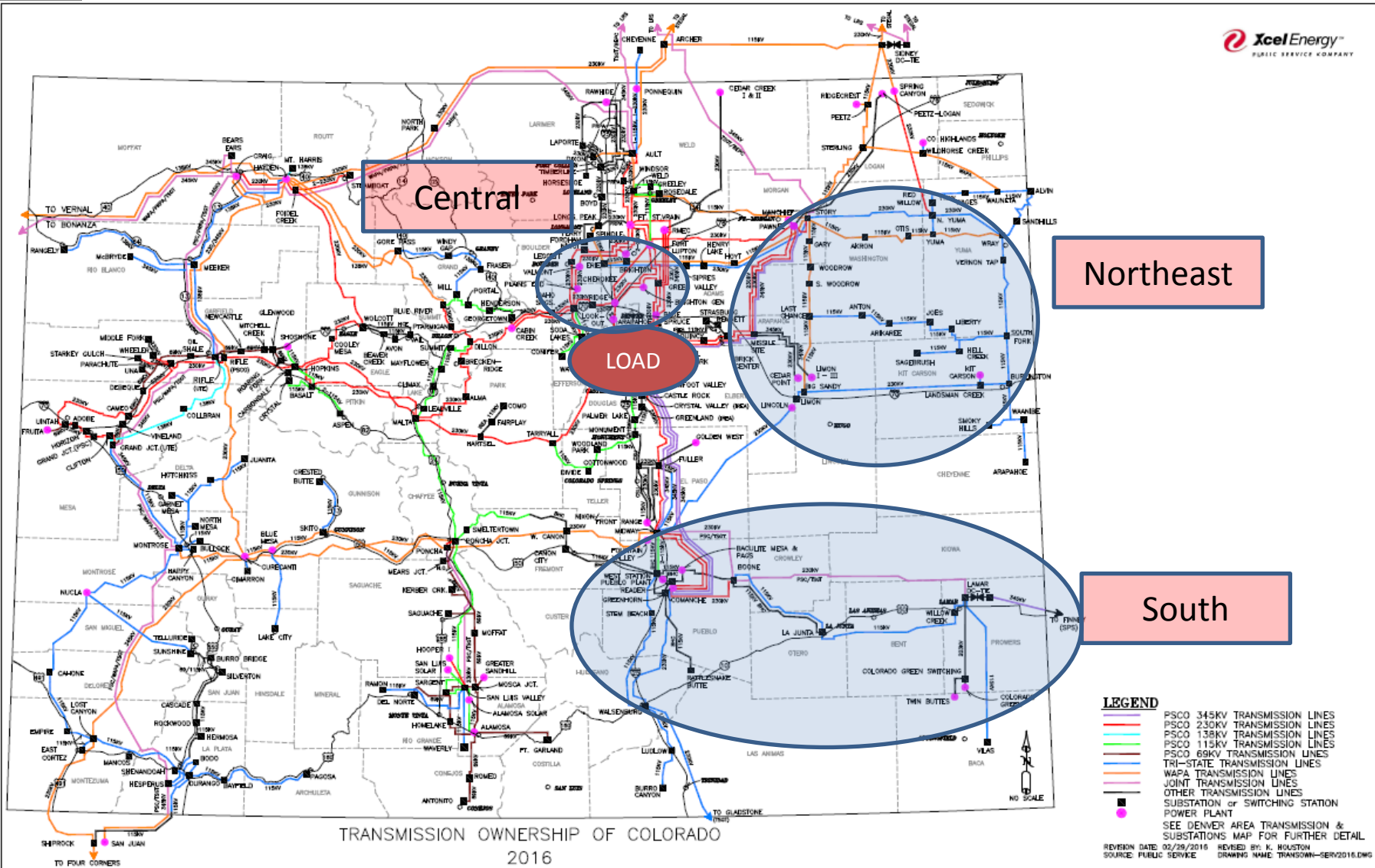
- **Locations for Generation:**

- Northeast, South, Central

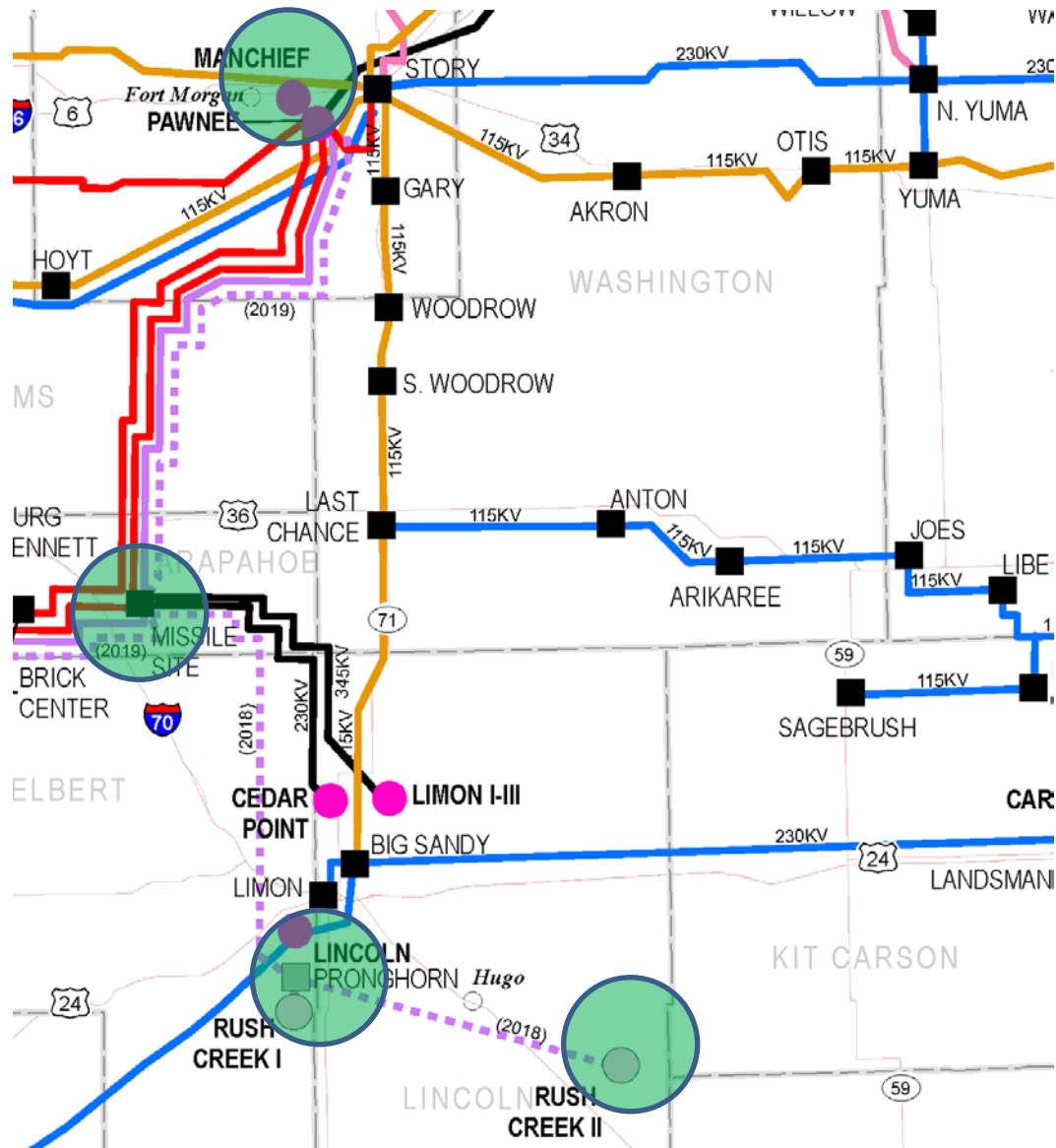
- **Methodology**

- Rely on Previous Studies
- Perform Additional Analyses

Injection Areas



Northeast System



Northeast Capacity

- Refer to Rush Creek Task Force Studies
- Capacity (From Benchmark):
 - 550 MW Incremental over Rush Creek
 - Limit is Denver-metro Underground Line
 - 850 MW Inc. with Metro Upgrade

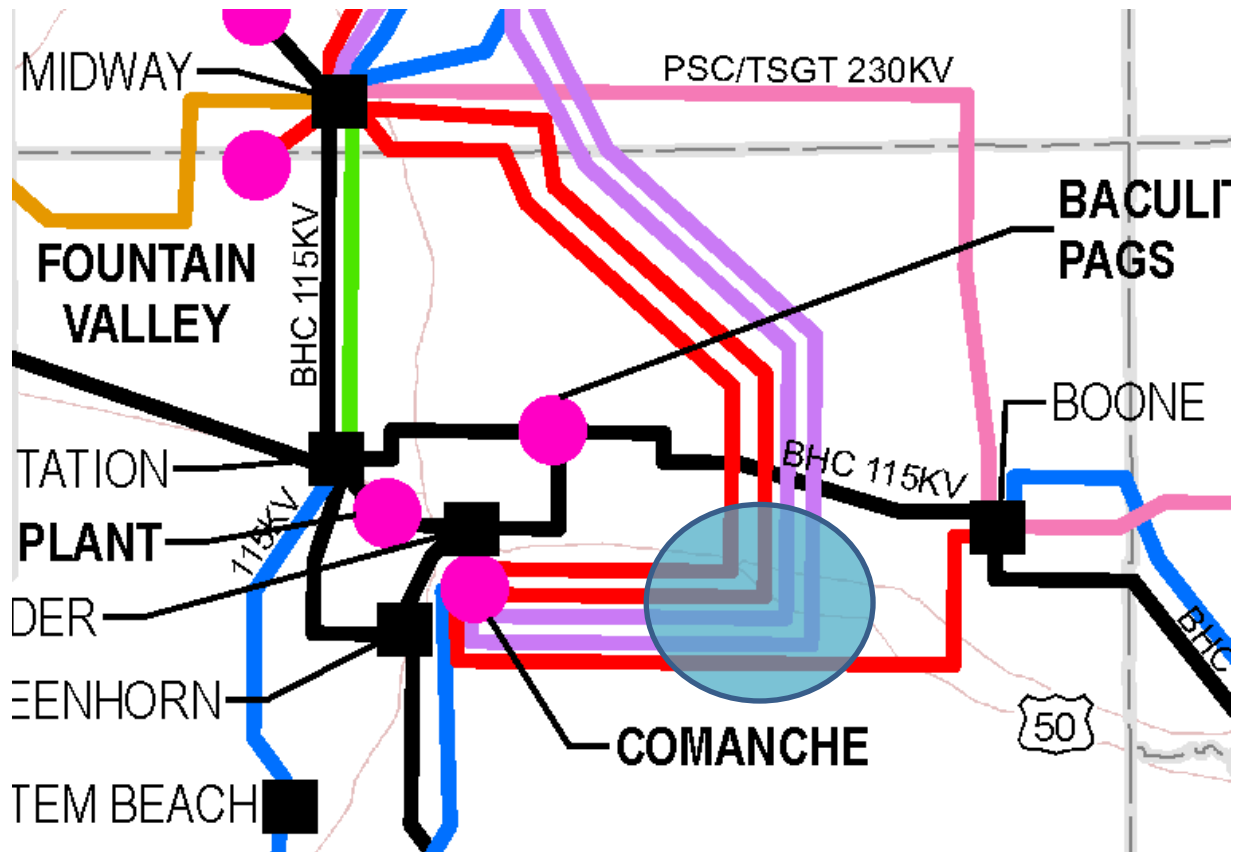
Northeast Capacity

Type	Generation Name	Nameplate MW	RCTF Levels	% NP	RCTF MAX
Wind	Peetz Logan	575	230	40%	230
	Limon	600	480	80%	480
	Cedar Point	250	200	80%	200
	Rush Creek	600	600	100%	1150
Total Wind		2025	1510	75%	2060
Coal	Pawnee	530	530	100%	530
Gas	Manchief	280	280	100%	280
Total		2835	2320	82%	2870

South Capacity

- Switching Station
- LGIP Studies
- Additional Studies

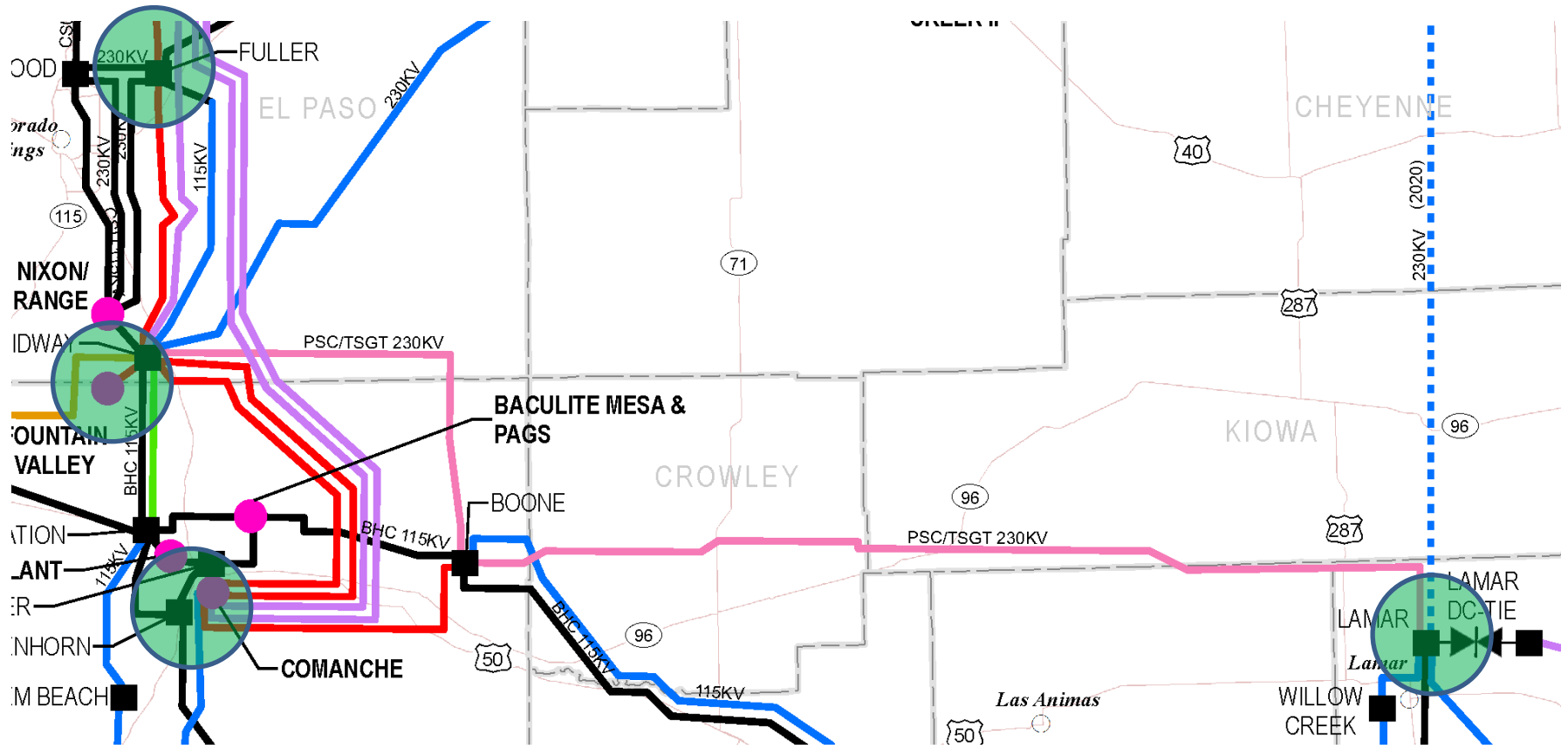
Substation General Location



Switching Station

- Concept:
 - Electrically Equivalent to Comanche
 - Allow Additional Generation Interconnections
 - Similar Concept as Missile Site
 - Flexibility for Future Expansion
- Planned Configuration CEP
 - Bisect one 345 kV, one 230 kV Com-DP
 - One 345/230 kV transformer
- Separate CPCN

South System



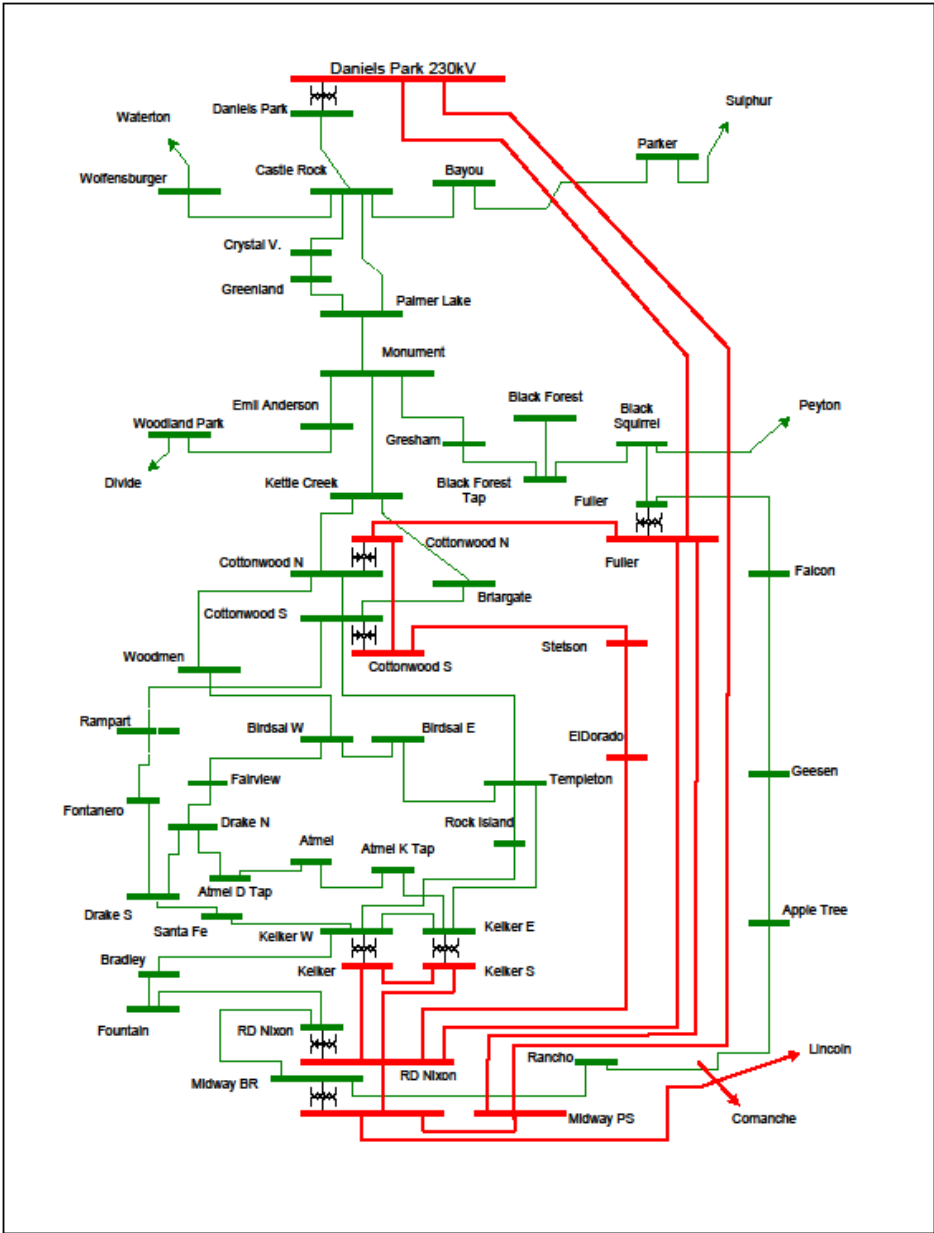
Southern Capacity Dispatch

Type	Generation Name	Nameplate MW	CEP Study A	CEP Study B	% NP
DC Tie	Lamar	210	101	101	48%
Wind	Colorado Green	162	130	130	80%
	Twin Buttes	150	60	60	40%*
	Fuller	250	200	200	80%
Total Wind		562	390	390	69%
Solar	Comanche	120	102	102	85%
Coal	Comanche 1&2	725	703	703	97%
	Comanche 3	805	805	805	100%
Total Coal		1530	1508	1508	99%
Gas	Fountain Valley	240	240	0	
Total		2662	2341	2101	79%
* TB is 50% TSGT; PSCo portion at 80% output.					

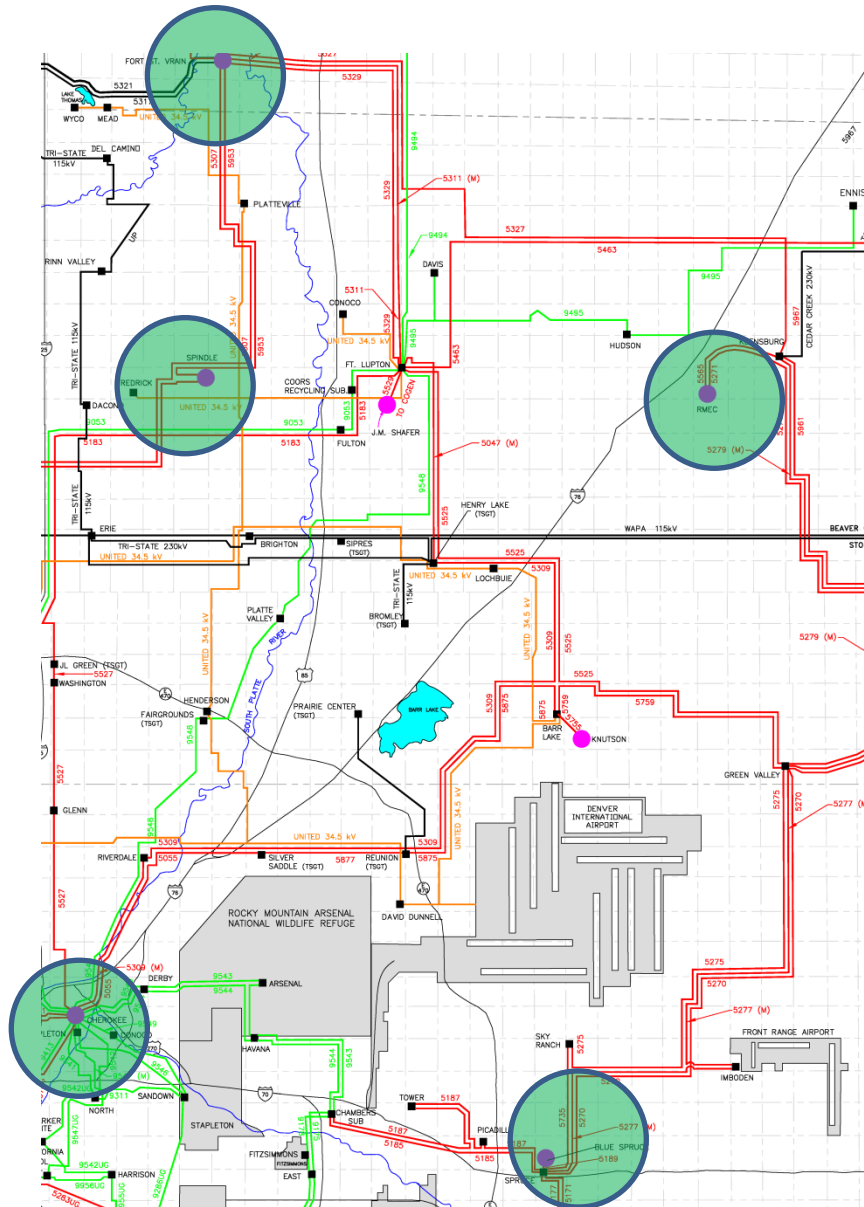
South Capacity Preliminary Results

- Comanche & Badger Hills Equivalent
- 1 MW Comanche Retirement = 1 MW New Capability (660 MW)
- Capacity (240 MW @ FV)
 - 250 MW @ Switching Station
 - Limit is CSU System
- Capacity (0 MW @ FV)
 - 500 MW @ Switching Station
 - Limit is CSU System
- Caveats:
 - CSU Operating Procedure Implemented

CSU – Old Map



Central System



Central (Gas) Capacity Studies

Location	Injection Capability (MW)	Limiting Element	Limiting Contingency
Cherokee 115 kV NE	250	Cherokee - Conoco South 115 kV Line	Cherokee 230/115 kV Tsfrmr No. 2
Cherokee 115 kV SE	50	Cherokee - California 115 kV Line	Cherokee - Argo 115 kV Line
Cherokee 230 kV	400	Cherokee - Mapleton 115 kV Line	Cherokee - North 115 kV Line
Fort Saint Vrain	400	NA	NA
RMEC	100	RMEC - Green Valley 230 kV Line	RMEC - Keensburg 230 kV Line
Spindle	250	Spindle - Fort Saint Vrain 230 kV Line	Spindle - Valmont 230 kV Line
Spruce	400	NA	NA

Next Steps

Next Steps

- **Document Results**
- **Post to CEPTF Site**
- **Supplemental Testimony (November 28)**
- **Bid Vetting**
- **Portfolio Studies**

Schedules

Regulatory Schedule

Date	Deadline
Wednesday, August 30, 2017	RFPs issued
Tuesday, November 28, 2017	Bids received
Thursday, December 28, 2017	30-Day Report
<i>Monday, February 12, 2018</i>	<i>45-day bid evaluation and selection [add 30 days]</i>
<i>Friday, April 27, 2018</i>	<i>120-Day Report [add 30 days]</i>
May 29, 2018	Independent Evaluator Report*
June 11, 2018	Intervenor's Comments*
June 26, 2018	Company's Comments*
July 26, 2018	Commission Decision on Phase II*



RESOURCE INFO

Resources

➤ Links:

➤ **CCPG**

- ▶ <http://regplanning.westconnect.com/ccpg.htm>

➤ **CEPTF**

- ▶ http://regplanning.westconnect.com/ccpg_ceptf.htm

➤ **Rush Creek Task Force**

- ▶ http://regplanning.westconnect.com/ccpg_rush_creek_tf.htm

➤ **ERP / CEP Information**

- ▶ https://www.xcelenergy.com/company/rates_and_regulations/resource_plans

➤ **Email:**

➤ **Tom Green:**

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➤ **ERP/CEP/RFP:**

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QUESTIONS