

PSCo Senate Bill 100 Transmission Study Group

June 14, 2007



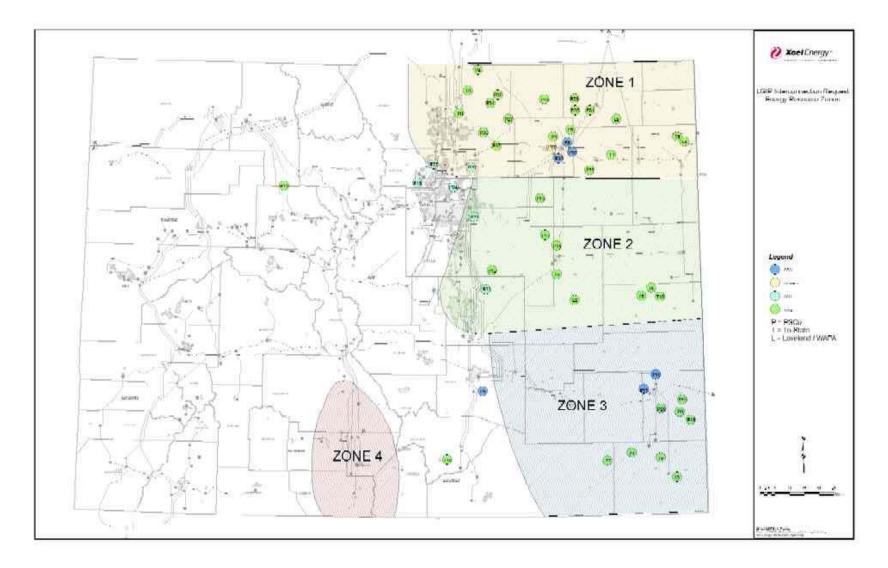
Senate Bill 100 Transmission Study Group

Transmission Study Team Goals

- Discuss preliminary transmission plans for each energy resource zone
- Discuss approximate MW levels of injection for each plan
- Get input on the proposed transmission plans/input on new plans
- Decide final list of study plans (July 1st 2007)
- Perform stand alone technical studies plus cost estimates and project schedules for each zone

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Senate Bill 100 Energy Resource Zones





Senate Bill 100 Transmission Plan Zone 1

 PSCo Transmission Planning will perform system studies for the four energy resource zones identified

Zone 1 (Northeast Colorado)



Pawnee Region: (A) Transmission plan to add additional Available Transmission Capacity (ATC)

 (A) Upgrade the existing 230 kV Pawnee – Quincy - Smoky Hill – Daniels Park, and Pawnee – Daniels Park lines to 637 MVA.



(B) Transmission plan for a 345 kV switchyard at Pawnee.

Cost: \$102 million Time Frame: 65 months

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Transmission Plan Zone 1 – Pawnee Region

Peetz-Logan 2 Units 400 MŴ 140 MW Ea. Manchief Unit 1 230 kV 530 MW 230 kV To (2) Pawnee Story 230 KV To 230 kV St. Vrain ليليا ليليا m m Ft. Lupton 230 KV Pawnee 345 kV ¥ То 230 kV To Ft. Lupton Green Valley 115 kV 230 kV To 230 kV To JL Green/Cherokee H. Lake/Cherokee 230 kV То New 345 kV Thermal Carbonics New ROW and Quincy 80-Miles Thermo Industries 230 KV **Brick Center** 230 KV Smoky Hill 230 KV **Replace Existing** Double Circuit 345 kV 230 kV Single Structures in Existing Corridor **Circuit Structures** (String Conductor on Both Sides, with Double but use only one) Circuit Murphy Creek ~20 Miles 345 kV Structures 230 kV 15-Miles **Daniels Park** Surrey Ridge 345 kV 230 kV LEGEND Existing System -3E То Proposed 35 Sulphur Transmission 115 kV Additon 35 345/230 kV ليليا Sulphur 560 MVA m 230 kV Autotransformer **Daniels Park** Lemon Gulch 230 kV

230 kV

Figure 1- Transmission Network with Recommended Upgrades for **Pawnee Region**

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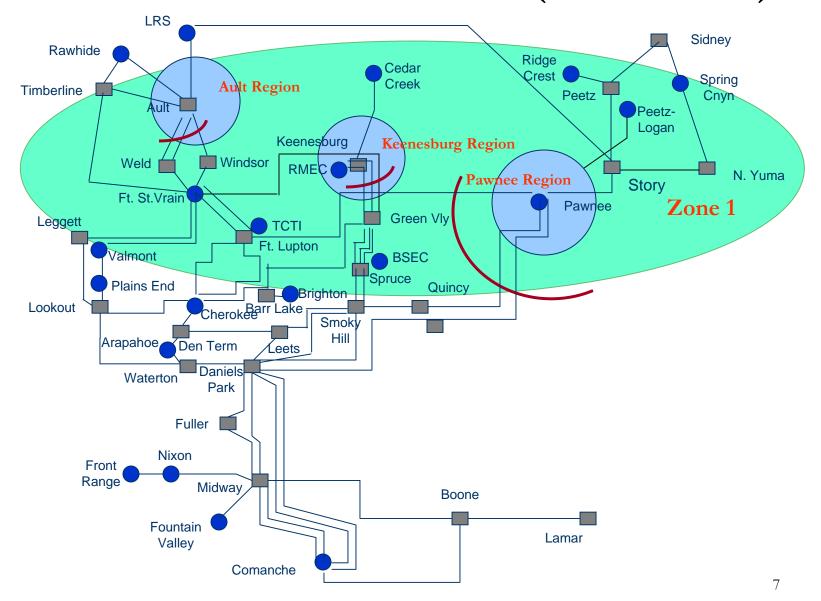
Senate Bill 100 Transmission Plan Zone 1

Zone 1 (Northeast Colorado - cont.)

- Keenesburg Region: Network upgrade requirements are presently being studied for injection into Keenesburg 230 kV. Ongoing studies include GI-2007-5 and GI-2007-6. Studies being coordinated with WAPA, PRPA and Tri-State.
- Ault Region: In process of evaluating the need for additional ATC to accommodate new alternatives of 300 MW (GI-2007-3, 2010) and additional 300 MW (GI-2007-4, 2013) injection into Ault area. Studies being coordinated with WAPA, PRPA and Tri-State.

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Transmission Plan: Zone 1 (NE Colorado)





Senate Bill 100 Transmission Plan Zones 2&3

Zone 2 (East Central Colorado)



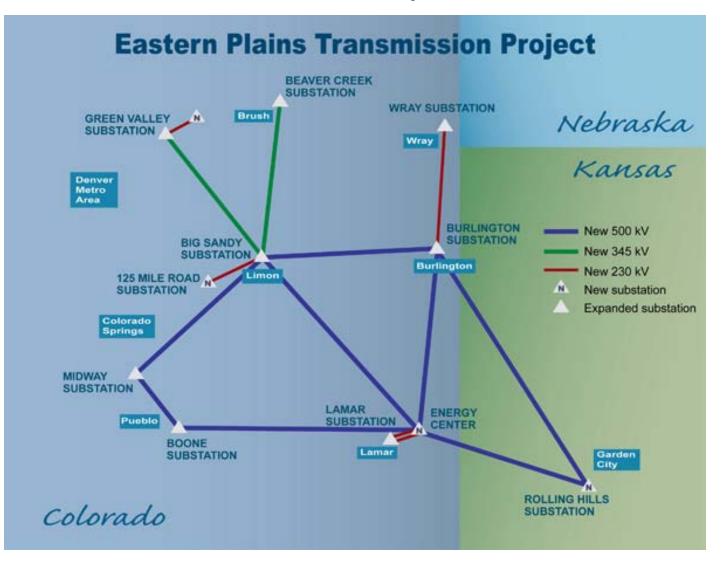
- Evaluate and incorporate the transmission study of the planned Eastern Plains Transmission Project (EPTP). Discuss status of project with Tri-State and WAPA.
- Evaluate Brick Center Substation for injection of generation

Zone 3 (South East Colorado)

- Boone/Las Animas Region: Utilize the transmission study of the Generator Interconnection Request 2007-2 for a 675 MW unit near Las Animas. Stand alone project without EPTP.
 - Cost: \$288 million Time Frame: 77 months
- Lamar Region: Transmission Plan to add addition ATC to relieve the current constraint from the South East area though Boone and into Denver Metro area.

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Transmission Study Plan: Zone 2



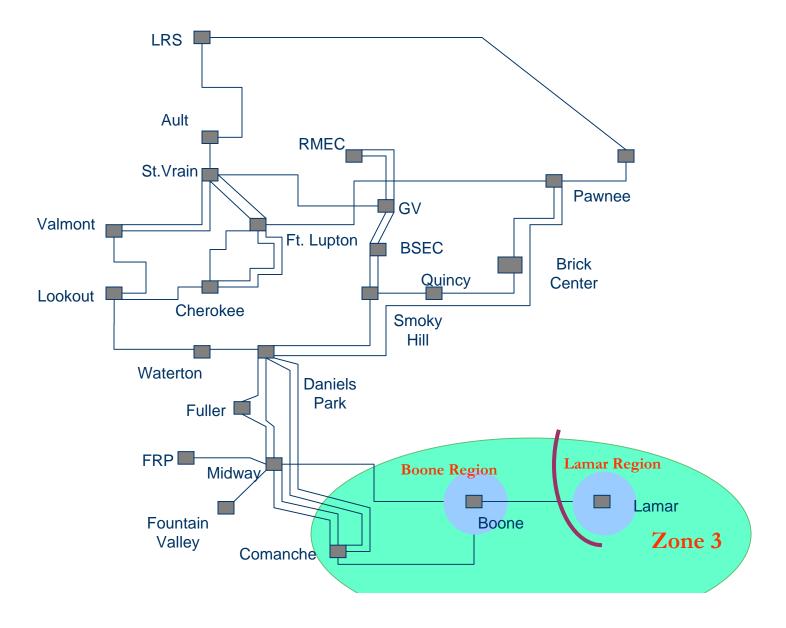
🕗 Xcel Energy~ Transmission Plan Zone 3 – Boone Region Pawnee 8-Miles Each Section Тο Ft. Lupton (16 miles Total) Replace Existing 230 kV Single Circuit Structures with Double Circuit 560 MVA Rating 345 kV Structures For all 345/230 kV Rated @ 800 MVA (2000 Autotransformers Amps) each @ 230 kV Smoky Hill Brick Center 230 KV Quincy П Brick Center 345 kV υ Lines Rated 637 MVA Figure 2- Transmission Network with Recommended Upgrades for Lines Rated 4 New 135-mile 345 kV Double Boone/Las Animas Region 637 MVA Circuit Line (2/C bundled 954 ACSR) То Daniels Park 135-Miles То _ ---via Murphy, Legend Daniels Park Sulphur, Surrey Ridge Existing New 345 kV Single Circuit SE TAP 560 MVA Rating Network Upgrades For For all 345/230 kV Autotransformers Interconnection 39-Miles Boone Network Upgrades For 345 KV 50-Miles Delivery То մ Midway 82-Miles Las Animas Boone IGCC 230 KV 345 kV То Lamar New 345 kV Double Circuit

То

Comanche

String One Side.







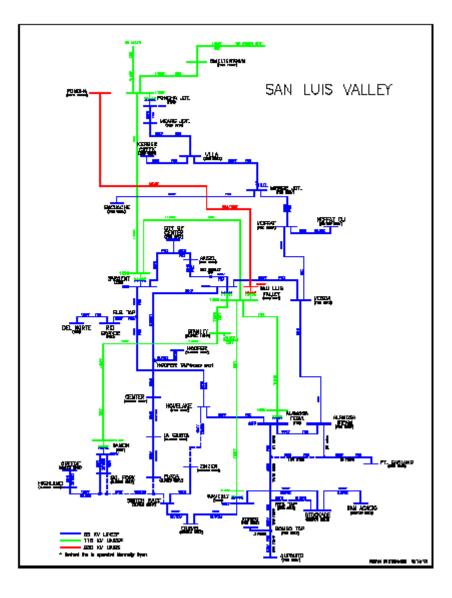
Senate Bill 100 Transmission Plan Zone 4

Zone 4 (San Luis Valley - Colorado)

- Evaluate current system capacity of injection at San Luis Valley (SLV) substation with the existing Transmission System
 - Preliminary Studies show that generation at the SLV Substation can inject:
 - 175 MW for light load conditions (night, no irrigation load)
 - 200 MW for peak summer conditions (mid-afternoon, July, high irrigation loads)

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Senate Bill 100 Transmission Plan Zone 4





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Questions?