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Title: Comments:
Planning and Processing of New or Upgraded Electric
Transmission Systems in New Mexico

(Senate Memorial 44)

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Intended for: RETA Transmission Corridor subcommittee



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**Planning and Processing of New or Upgraded
Electric Transmission Systems in New Mexico**
(Senate Memorial 44)

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July 22, 2009



Comments: Planning and Processing of New or Upgraded Electric Transmission Systems in New Mexico

PURPOSE

RETA has been requested to identify and prioritize renewable energy resource zones in New Mexico that have a potential to support industry development among renewable energy developers for renewable resource generation projects. Moreover, Senate Memorial 44 requests that RETA identify and prioritize the best viable options for potential transmission corridors to accommodate renewable energy export from New Mexico in accordance with a defined time-line and to convene a working group to submit recommendations to the legislature for establishing a process to streamline procedures for establishing renewable energy transmission projects in New Mexico.

RETA's July 9, 2009 request for comments outlined seven topical areas of specific value to Senate Memorial 44. This document addresses Topics 1, 3 and 4.

COMMENTS

(Topics 1, 3) Identify existing generation and transmission lines and renewable energy resource zones within New Mexico that have the potential to support competition among renewable energy developers; Identify, using additional information, the best options for potential transmission corridors to accommodate renewable energy exports from New Mexico.

The process of defining New Mexico's renewable energy zones (REZ) as manageable operational units and assessing their specific electrical characteristics requires a significant technical effort. That process is beyond the scope of comments provided by Los Alamos in this document. However, a useful assessment of New Mexico's grid can be accomplished by coarser subdivision into "quadrants". See Figure 1 for reference.

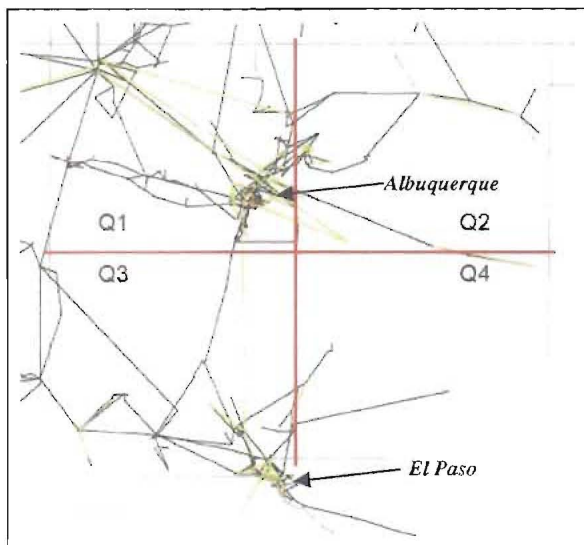
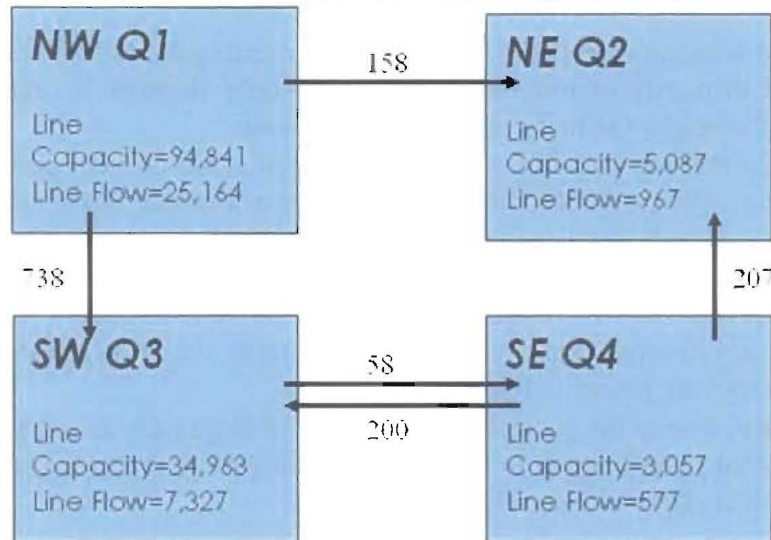


Figure 1. New Mexico's transmission grid showing assignment of quadrants (Q1 through Q4). Each zone contains unequal capacities of generation and transmission. The state's largest electric demand center (Albuquerque) is located in Q1, which also contains the state's largest source of electric supply, Four Corners power plants. Currently, a large fraction of the state's outflow (exported power) passes through Four Corners transmission hub.

(Source: 2007 FERC 715 utility data filings)

The decomposition of New Mexico's grid into coarse transmission units (or quadrants) is a useful method for understanding how REZ could be identified and managed. There are currently 20 transmission ties between quadrants, using a total of 51 circuits. An additional 477 transmission circuits exist which do not cross quadrant boundaries. Figure 2 summarizes key flow features of the state's transmission grid between each quadrant. Transmission line capacity and estimated line flow totaled within each quadrant are also shown. Flow values correspond to high summer demand conditions in 2007.

Figure 2. Quadrant transmission flow in New Mexico's grid (all values megawatts, MW)



The following preliminary observations can be made, based on information provided in Figure 2:

- The degree of utilized line capacity varies greatly among New Mexico's quadrants; Q1 is approximately 26% utilized on average under summer peak conditions, while Q4 is 17% utilized; this statistic provides a general measure of the degree to which transmission access is limited, given existing flow conditions.
- Average line utilization does not reflect the possible spread of flow values, some circuits are loaded above 50%, while others are loaded very lightly, below 10%.
- No significant transmission line capacity interconnects any pair of quadrants except Q1 and Q3.
- Only Q3 currently offers a significant amount of unused line capacity for renewable resource development within the quadrant; it is also connected to the Four Corners export hub.
- The only currently exporting quadrants are Q1 and Q4. This is attributable to operation of generation at Four Corners (Q1) or intertie/generation at Blackwater, Artesia (Q4).
- Export of excess power must be currently routed through Four Corners hub; due to the lack of interconnecting capacity from Q2 and Q4, there is limited routing capacity for moving large amounts of power out of New Mexico from these quadrants; eastern line intertie capacity is also currently limited.
- Only Q1 offers sufficient excess line capacity and export ties to serve as a development zone without significant transmission upgrades.

(Topics 4) Identify administrative, jurisdictional and other barriers that may impede effective and expeditious opportunities for developing electric transmission infrastructure to support renewable energy production in New Mexico and for export outside the state.

The most significant barrier related to in-state transmission is lack of adequate line capacity tying New Mexico's quadrants into a tightly integrated grid. *RETA should evaluate policies which promote the operation of each quadrant independently with different export requirements.* Under this scheme, New Mexico's transmission quadrants would:

- Export power to adjacent states only, initially using existing (weak) tie circuits. Q3 for example would primarily export renewable power only through its existing ties to Arizona, Q2 to Colorado, Q4 to Texas and Oklahoma etc.
- Effectively avoid the construction of high capacity transmission circuits across New Mexico, allowing each quadrant to be administered as a separate planning zone.
- Eventually, ties to each state would be upgraded to allow increased use of New Mexico's renewable resources as export power.
- By distributing power flow more uniformly around the New Mexico's boundary, it is possible that transmission capacity in adjacent states could be more effectively leveraged when moving power to load centers.
- This approach also avoids the possible complication of large pass-through flows which arise when adjacent states attempt to move export power from their renewable resource zones to load centers beyond New Mexico.