

**CCPG CONCEPTUAL WORK GROUP  
SCENARIO #3 FOR 20 YEAR PLAN**

**Alternatives 1A (base forecast) and 1B (3% forecast)**

**DISCUSSION**

Attached are several exhibits. These exhibits will be discussed at the next meeting on March 11 at PSCo's offices, 9:30-11:00 am.

These exhibits are supposed to capture the final results from all the recommendations that have been made throughout the year, especially from our last meeting. In these results, the wind and solar generation demand were allocated as a percentage of each utility's energy requirement for renewable energy. The conventional generation was allocated for each utility as a percentage of each utility's contribution to the total incremental load demand from 2012 to 2030. These allocations conceptually make better sense than my original allocations based on load demand.

The attachments are two PDF files and four Excel files. (Please note that these exhibits do not follow the titles of the previous drawings and tables – ignore those.) The PDF file "Utility – Demand and Energy Forecasts" are copies of the forecasts given to me by the utilities. The PDF file "Drawings" contains copies of Figures 1 and 2, and Drawings 1A and 1B (power flow drawings of the base case forecast scenario and the 3% forecast scenario.) The Excel files show Tables 1-9, the logical progression in going from the Colorado load forecast, to the generation calculations and allocations, and to the power flows of Diagrams 1A and 1B.

**ASSUMPTIONS**

**Renewables**

30% energy generation of the entire Colorado load will be from renewable resources, namely wind generation and solar generation.

**Wind generation**

37% capacity factor ( Actual from PSCo data 2010 YTD),  
20% of total on-peak,  
80% of total off-peak,  
Based on cost, will provide 2/3 of renewable energy generation.

**Solar Generation**

Photo voltaic – 25% of total, 30% capacity factor, 65% on on-peak.  
Solar with storage – 75% of total, 50% capacity factor, 95% on on-peak.  
Solar – 0 % off-peak.  
Based on cost, will provide 1/3 of renewable energy generation.

**Allocation of renewable generation\***

ERZ1 – 26% of total wind generation.  
ERZ2 – 30% of total wind generation.  
ERZ3 – 39% of total wind generation.  
ERZ4 – 100% of total solar generation.  
ERZ5 – 5% of total wind generation.

**Allocation of conventional generation**

(As per Table 7)

**Note:\*** As per the CWG meeting on January 14, 2011, the group agreed to take half of the Pawnee wind generation and half of the Missile Site generation; add this sum to the Vilas wind generation; take that total and assign one third to the Vilas site, one third to the Lamar site, and one third to the Burlington site. In addition, take the PV total solar generation of the San Luis Valley and add it to the Lamar site, leaving the solar generation with storage at the San Luis Valley.

**Transmission Lines**

From experience gained in doing transient stability studies, a 1000 MW power plant 200 miles from the load serving network requires three 345kV lines for stability reasons for an N-1 criterion. With three 345kV lines, this assigns 500 MW per circuit after the outage of one circuit.