

DAVIS DRAFT 8-Oct-13



COLORADO PUBLIC UTILITIES COMMISSION REGULATION OF WATER USE BY ELECTRIC UTILITIES

Ron Davis

Chief Advisor, Colorado Public Utilities Commission

Public Utilities Commission

MISSION

"The Colorado Public Utilities Commission serves the public interest by effectively regulating utilities and facilities so that the people of Colorado receive safe, reliable, and reasonably-priced services consistent with the economic, environmental and social values of our state."



- Operating Authority
 - ▣ Determine benefit to consumers in granting right to do business
- Rates
 - ▣ Maintain just and reasonable utility rates for consumers
- Service
 - ▣ Ensure consumers have reliable and responsive utility service
- Safety
 - ▣ Minimize dangers for consumers related to regulated utility service
- Infrastructure
 - ▣ Ensure a constructive regulatory environment to recover capital

Colorado Electric Utilities

- Two investor-owned electric utilities (IOUs)
 - ▣ **Public Service Company of Colorado** (Xcel Energy)
 - 1.4 million electric customers
 - ▣ **Black Hills/Colorado Electric Utility**
 - 94,000 electric customers
(Pueblo, Rocky Ford, Canon City)
- One wholesale generation and transmission cooperative
 - ▣ **Tri-State Generation and Transmission**
 - 18 rural electric co-ops served



Interest in Water Usage



- 04A-214E: Comanche 3 Generation Unit. Xcel Energy proposed to utilize a low water use cooling technology in addition to emission control technologies. Commitment to work with Pueblo community on water and water rights.
- 10M-245E: Clean Air-Clean Jobs Act. Reduced water usage at Cherokee and Valmont stations (retirements/conversions/replacements)

Electric Resource Planning



- Reliability
 - ▣ Helps the Commission ensure that sufficient electricity resources are available
 - ▣ Informs the Commission how the utility intends “to keep the lights on”
- Cost-effectiveness
 - ▣ Helps the Commission ensure that utilities procure the best mix of new utility resources
 - ▣ Colorado’s public policy objectives
 - ▣ Consideration of the benefits and cost of various alternatives

ERP Rules



- Commission took a “measured step” away from the least-cost resource planning in order to:
 - ▣ Incorporate changes from new energy legislation
 - ▣ Enable the Commission to consider factors other than fuel costs, construction costs, conventional operating costs, and transmission costs in resource selection (*e.g.*, **water usage**)
- Commission approves specific combinations of demand-side and supply-side resources
- Various scenarios or combinations of resources for the Commission to consider in approving a cost-effective resource plan

ERP Rulemaking (10R-214E)

- Commission improved ERP practices based on the experiences we gained through first applications of the ERP process.
 - ▣ New legislative requirements (HB 10-1001)
 - ▣ Consideration of water usage in existing and proposed generation resources in resource selection

utility's modeling for its resource plan from utility resources expected to be acquired during the planning period.

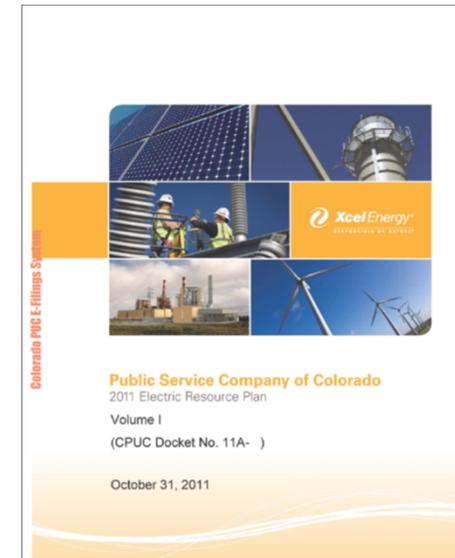
(h) The annual water consumption for each of the utility's existing generation resources, and the water intensity (in gallons per MWh) of the existing generating system as a whole, as well as the projected water consumption for any resources proposed to be owned by the utility and for any new generic resources included in the utility's modeling for its resource plan.

(h) The proposed RFP(s) the utility intends to use to solicit bids for energy and capacity the resources

Xcel Energy ERP(11A-869E)

Attachment 2.4-7 2010 Water Consumption

<i>Generating Station</i>	<i>Annual Net Generation (MWh)</i>	<i>Annual Consumptive Use (gallons)</i>	<i>Water Intensity (gallons/MWh)</i>
Public Service - Owned			
Arapahoe	608,811	360,445,625	592
Zuni	3,739	5,008,330	1339
Cherokee	3,671,855	1,976,467,945	538
Comanche	9,279,180	2,840,037,399	306
Pawnee	3,378,800	1,516,418,733	449
Hayden	3,817,906	1,216,314,000	319
FSV	3,347,997	597,832,892	179
Valmont	1,090,643	1,206,952,104	1107
Rocky Mountain Energy Center	2,889,657	728,016,304	252
Hydro-power plants	66,652	51,240,070	769
Alamosa*	3,631.8	-	0
Blue Spruce Energy Center*	379,789.0	-	0
Ft. Lupton*	3,181.1	-	0
Fruita*	578.8	-	0
Total - Owned Facilities	28,542,421	10,498,733,402	368



Xcel Energy ERP(11A-869E)

Table 2.8-1 Generic Dispatchable Resource Cost and Performance

	RAP Generic Resources				Post-RAP Generic Resources			
	2x1 Combined Cycle ³	1x1 Combined Cycle ⁴	Combustion Turbine ⁵	Battery ⁶	Baseload Plant ⁷	2x1 Combined Cycle ⁸	1x1 Combined Cycle ⁹	Combustion Turbine ¹⁰
Dispatchable Resources^{1,2}								
Nameplate Capacity (MW)	808	346	214	25	511	780	335	214
Summer Duct Firing Capacity (MW)	128	63	N/A	N/A	N/A	121	62	N/A
Summer Peak Capacity with ducts (MW)	658	315	173	25	485	643	310	173
Cooling	Wet	Wet	N/A	N/A	Dry	Dry	Dry	N/A
Capital Cost (\$/kW) ¹¹	\$713	\$1,181	\$655	\$3,000	\$5,013	\$783	\$1,273	\$655
Electric Transmission Delivery (\$/kW-yr) ¹²	\$28	\$0	\$0	\$0	\$28	\$28	\$0	\$0
Gas Demand (\$000/yr) ¹³	\$4,800	\$2,400	\$0	\$0	N/A	\$4,800	\$2,400	\$0
Book Life	45	45	40	15	60	45	45	40
Fixed O&M Cost (\$000/yr)	\$5,777	\$3,861	\$886	\$0	\$20,859	\$5,777	\$3,861	\$496
Variable O&M Cost (\$/MWh)	\$2.37	\$2.43	\$10.43	\$0.00	\$9.59	\$1.65	\$1.74	\$10.43
Ongoing Capital Expenditures (\$000/yr)	\$3,386	\$1,903	\$1,343	\$0	\$12,528	\$3,386	\$1,902	\$1,343
Heat Rate with Duct Firing (btu/kWh) ¹⁴	7,173	7042	N/A	N/A	N/A	7,469	7253	N/A
Heat Rate 100 % Loading (btu/kWh)	6,947	6,733	10,596	N/A	13,022	7,143	6878	10596
Heat Rate ~75 % Loading (btu/kWh)	7,014	7021	11,207	N/A	13,535	7,190	7200	11207
Heat Rate ~50 % Loading (btu/kWh)	7,135	7,277	12,769	N/A	14,685	7,239	7478	12769
Heat Rate ~30 % Loading (btu/kWh)	7,849	N/A	N/A	N/A	18,585	7,720	N/A	N/A
Forced Outage Rate	3%	3%	3%	0%	6%	3%	3%	3%
Maintenance (wks/yr)	2	2	0.5	0.0	4	2	2	0.5
Typical Capacity Factor	37%	37%	9%	N/A	85%	37%	37%	9%
CO2 Emissions (lbs/MMBtu)	118	118	118	N/A	22	118	118	118
Water Consumption (acre-ft/yr)	4,125	26,799	N/A	N/A	N/A	N/A	N/A	N/A
Turnaround Efficiency	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Storage Capability (MWh)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

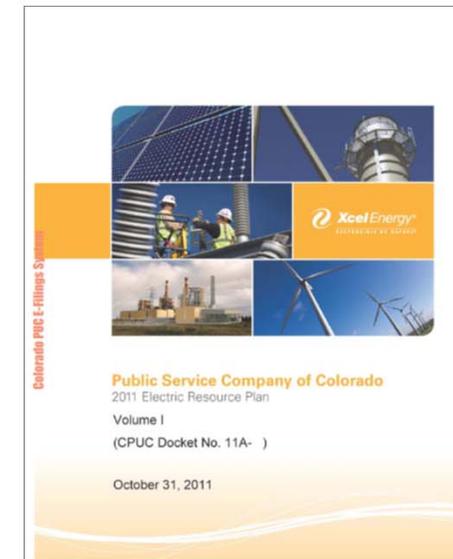
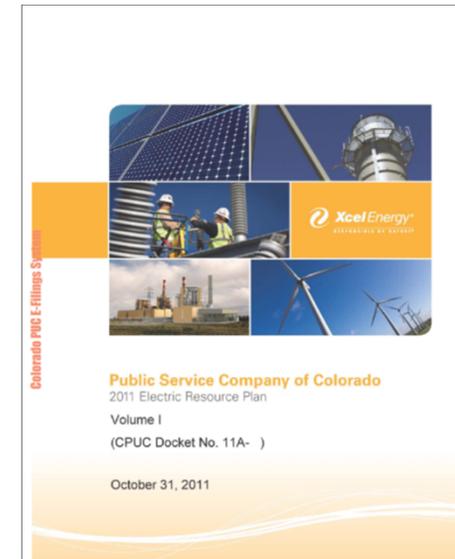


Table 2.8-2 Generic Renewable Resource Cost and Performance

Renewable Resources ¹	PTC Wind	Non PTC Wind	30% ITC Solar PV ²	10% ITC Solar PV ²	30% ITC Solar Thermal with storage ³	10% ITC Solar Thermal with storage ³	30% ITC Solar Thermal with storage ³	10% ITC Solar Thermal with storage ³
Nameplate Capacity (MW)	100	100	25	25	50	50	125	125
ELOC Capacity Credit (MW)	12.5	12.5	13.8	13.8	50	50	125	125
Book Life	25	25	20	20	25	25	25	25
Transmission Delivery (\$/kW) ⁴	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Variable Cost (\$/MWh)	\$38	\$68	\$99	\$130	\$202	\$253	\$178	\$223
Dispatchable	no	no	no	no	partial	partial	partial	partial
Forced Outage Rate ⁵	0%	0%	0%	0%	0%	0%	0%	0%
Maintenance (wks/yr) ⁶	0.0	0.0	0.0	0.0	0	0	0	0
Water Consumption (acre-ft/yr)	0.0	0.0	0.0	0.0	77	77	192	192
Typical Capacity Factor	48%	48%	30%	30%	38%	38%	38%	38%

Xcel Energy ERP(11A-869E)

- RFP review
- “Describe the water supply strategy for the project, including a description of water requirements, water supply source(s), discharge plans, new water pipeline requirements, and any work completed to date on the water supply plan.”



Permitting Plan. Proposals must describe all air quality permits that will be required for the project. State whether any air permits have been secured, and if not, whether applications have been filed. Report on the status of any pending applications and any feedback from permitting agencies. Describe the expected time frame to obtain the necessary air permits after application submittal to the State.

Describe all other federal, state and local permits and approvals that will be required for the project, but not limited to:

- Federal environmental assessments under the National Environmental Policy Act ("EA/EIS"),
- Water supply,
- Wastewater discharge permits,
- Hazardous waste permits, and
- No-hazard permits/determinations from the Federal Aviation Administration.

Xcel Energy ERP(11A-869E)

Table 19 - Summary of Section 123 Attributes

Bid ID	Natural Gas Bids							Wind Bids			Solar Bids			Section 123		
	G006	G008	G003	G010	G011	G012	G014	W013	W016	W023	SP01/02	SP09	SP12	SC01/02	G004	EC01
	Facility Name															
	Total Economic Output study result (million \$)															
														\$924 (1)		
Energy Security	Flexible generation that allows more intermittent renewable generation	X	X	X		X		X							X	
	Decreased reliance on out-of-state generation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Utilizes a domestic fuel source	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Resource geographic diversity								X	X	X					
	Baseload voltage support														X (2)	
	Enhanced oil recovery															
Economic Prosperity	Diversity in fuel supply							X	X	X	X	X		X	X (3)	
	Jobs - construction (peak)			X	X	X	X	200	67	100			~75-100	200-275	600	600
	Jobs - operations, existing	1	11	32											11	
	Jobs - operations, new					2	4	9-10	6	10	X	4	X	50	20	X
	Jobs - O&M support services	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Best use of fallow land												X			
	Ongoing landowner payments							X	X	X	X		X			
	Taxes-property	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Taxes-construction related				X	X	X	X	X	X	X	X	X	X	X	X	
Tourism													X			
Insulation from Fuel Price Increases	Flexible generation that allows more intermittent renewable generation	X	X	X		X		X								
	Fixed energy costs							X	X	X	X	X				
	Reduced exposure to future taxes							X	X	X	X	X				
Environmental Protection	Avoided Fossil Fuel Emissions (CO ₂ , NO _x , SO _x , PM)							X	X	X	X	X	X	X	X	
	Avoided generation water use							X	X	X	X	X	X	X	X	
	Reduced irrigation water use											X		X		



Information Meetings



- Nexus between electricity generation and water usage in the state of Colorado.
 - ▣ Drought resilience
 - ▣ Supply diversity
 - ▣ Recycled water
 - ▣ Cooperative agreement (with municipalities and agriculture)
- October 22, 2012 and January 23, 2013
 - ▣ Governor's Office, Colorado Water Conservation Board, Denver Municipal Water, Colorado River Water Conservation District, Sandia National Laboratories, Xcel Energy, Western Resource Advocates

Public Utilities Commission



Contact Information

1560 Broadway,
Suite 250
Denver, CO 80202

303-894-2000 or
1-800-888-0170

E-filings System

<https://www.dora.state.co.us/pls/efi/EFI.homepage>

(Search by docket number)

Website

www.dora.co.gov/puc