



Public Service of Colorado  
**Annual Progress Report**  
**2016 Electric Resource Plan**

(CPUC Proceeding No. 16A-0396E)

October 31, 2016

## **Introduction**

Public Service Company of Colorado ("Public Service" or "Company") filed its 2016 Electric Resource Plan ("ERP") on May 27, 2016 with the Colorado Public Utilities Commission ("Commission") in Proceeding No. 16A-0396E. The filing initiated "Phase I" of this ERP proceeding. An evidentiary hearing in this matter is scheduled for February 1-3, and 6-8, 2017, pursuant to Commission Decision No. C16-0867-1.

In compliance with Commission Rule 3618(a), the Company is filing this annual update to the 2016 ERP. This is the first annual update to the 2016 ERP. The Company previously filed annual updates to its 2011 ERP in October 2012, 2013, 2014 and 2015.

The 2016 ERP proposes using a competitive acquisition process to acquire any generation capacity needs over an eight-year Resource Acquisition Period ("RAP") that extends through the summer of 2023. As discussed below, the Company is currently forecasting a need for just under 400 MW of additional generation capacity by summer 2023, over 200 MW lower than the 615 MW of need initially forecast in the May 27, 2016 ERP filing.

Commission Rule 3618(a) requires the Company to file annual progress reports to its most recent ERP in order to "inform the Commission of the utility's efforts under the approved plan and the emerging resource needs and potential utility proposals that may be part of the utility's next electric resource plan filing." Annual progress reports are also to contain:

1. An updated annual electric demand and energy forecast,
2. An updated evaluation of existing generation resources,
3. An updated evaluation of planning reserve margins and contingency plans,
4. An updated assessment of need for additional resources, and
5. An updated report of the utility's plan to meet the resource need and the resources the utility has acquired to date in implementation of the plan.

### **1. Updated Annual Electric Demand and Energy Forecast**

The Company's most current annual demand and energy forecast was developed in late September 2016 and is summarized in Table 1. The Peak Demand forecast projects an increase in demand of roughly 700 MW over the 10-year period from 2016-2025. Demand in Table 1 represents the Company's September 2016 native load forecast and is shown:

- at the 50th percentile of peak demand,
- net of projected DSM Energy Efficiency peak load hour demand reductions consistent with Commission Decision No. C14-0731 in the DSM Strategic Issues Proceeding No. 13A-0686EG,<sup>1</sup> and
- gross of projected net-metered generation during peak load hours.<sup>2</sup>

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<sup>1</sup> Decision No. C14-0731 directed a targeted 65 MW of peak load hour reductions annually from energy efficiency programs.

Table 1 – September 2016 Demand and Energy Forecast

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Annual Energy Sales (GWh)</b>	31,029	31,618	31,582	31,966	32,129	33,060	33,227	34,065	34,531	34,707
<b>Summer Peak Demand (MW)</b>	6,478	6,565	6,628	6,682	6,712	6,846	6,913	7,051	7,113	7,187

The demand forecast of 7,051 MW for summer 2023 is 174 MW lower than the December 2015 demand forecast that was used in the Company’s May 27, 2016 ERP filing. This reduction in peak demand is the primary driver behind the approximately 200 MW reduction in projected resource need.

In the last few years, the Company has received a significant number of electric service requests from the oil and gas industry operating in our service territory in northeast Colorado. Accordingly, the Company has included the projected impacts of these electric service requests that are shown in Table 2 into the Company’s retail energy sales and summer peak demand forecast in Table 1.

Table 2 - Incremental Oil and Gas Industry Load

<b>In-Service Year</b>	<b>Request Total (MW)</b>	<b>Cumulative Total (MW)</b>
2016	-	-
2017	9	9
2018	0	9
2019	-	9
2020	4	13
2021	68	82
2022	16	98
2023	83	181
2024	30	211
2025	-	211

While the Company’s current retail energy sales and summer peak demand forecasts may change as a result of oil and gas market conditions, these totals reflect the best available information as of this update.

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<sup>2</sup> Consistent with the FERC Order on Rehearing and Compliance in Docket Nos. ER08-394-004 and ER08-08-394-005 issued on February 19, 2009, the Company does not reduce its native load forecast for behind-the-meter generation. Instead, all customer load is represented in the native load forecast and estimates of the net dependable capacity for behind-the-meter generation is carried on the loads and resources balance along with other generation resources.

## 2. Updated Evaluation of Existing Generation Resources

Table 3 shows that the Company’s Total Summer Net Dependable Capacity (“NDC”) is projected to decrease by approximately 520 MW over the time period from 2016 to 2025. This change includes the impacts of Company-owned plant retirements, increased capacity at the Cabin Creek pumped hydro facility, an assumption as to the SPS Diversity Exchange, expiring PPAs, and assumptions as to incremental additions of customer-choice solar.

Table 3 - Summer Net Dependable Capacity

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Company-Owned Coal Subtotal	2,521	2,521	1,985	1,985	1,985	1,985	1,985	1,985	1,985	1,985
Purchased Coal Subtotal	248	150	150	150	150	150	150	-	-	-
<b>Total Coal-Fired Generation</b>	<b>2,769</b>	<b>2,671</b>	<b>2,135</b>	<b>2,135</b>	<b>2,135</b>	<b>2,135</b>	<b>2,135</b>	<b>1,985</b>	<b>1,985</b>	<b>1,985</b>
Company-Owned Gas-Steam Subtotal	-	-	352	352	352	352	352	352	352	352
Company-Owned CC Subtotal	1,836	1,836	1,836	1,836	1,836	1,836	1,836	1,836	1,836	1,836
Purchased CC Subtotal	379	379	379	250	250	250	250	118	-	-
<b>Total Gas-Fired CC</b>	<b>2,215</b>	<b>2,215</b>	<b>2,215</b>	<b>2,086</b>	<b>2,086</b>	<b>2,086</b>	<b>2,086</b>	<b>1,954</b>	<b>1,836</b>	<b>1,836</b>
Company-Owned CT Subtotal	726	726	726	726	726	726	726	726	726	726
Purchased CT Subtotal	1,069	1,069	1,069	1,069	1,069	1,069	813	813	813	813
<b>Total Gas-Fired CT</b>	<b>1,795</b>	<b>1,795</b>	<b>1,795</b>	<b>1,795</b>	<b>1,795</b>	<b>1,795</b>	<b>1,539</b>	<b>1,539</b>	<b>1,539</b>	<b>1,539</b>
<b>Total Gas-Fired Generation</b>	<b>4,010</b>	<b>4,010</b>	<b>4,362</b>	<b>4,233</b>	<b>4,233</b>	<b>4,233</b>	<b>3,977</b>	<b>3,845</b>	<b>3,727</b>	<b>3,727</b>
<b>Company-Owned Storage Subtotal</b>	<b>210</b>	<b>210</b>	<b>162</b>	<b>180</b>	<b>256</b>	<b>256</b>	<b>256</b>	<b>256</b>	<b>256</b>	<b>256</b>
<b>Purchased Biomass Subtotal</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	-	-	-
Company-Owned Hydro Subtotal	25	25	25	25	25	25	25	25	25	25
Purchased Hydro Subtotal	20	20	19	19	18	16	16	15	15	14
<b>Total Hydro Generation</b>	<b>45</b>	<b>45</b>	<b>44</b>	<b>44</b>	<b>43</b>	<b>42</b>	<b>42</b>	<b>40</b>	<b>40</b>	<b>40</b>
System Solar	47	130	130	129	128	128	127	127	126	125
Customer Choice Solar Total	92	92	91	91	90	90	90	89	89	88
Incremental Customer Choice Solar	6	22	69	107	146	186	222	257	289	318
<b>Total Solar Generation</b>	<b>145</b>	<b>244</b>	<b>290</b>	<b>327</b>	<b>365</b>	<b>404</b>	<b>439</b>	<b>472</b>	<b>503</b>	<b>532</b>
Company-Owned Wind Subtotal	-	-	-	49	49	49	49	49	49	49
Purchased Wind Subtotal	409	404	404	378	378	378	378	378	378	378
<b>Total Wind Generation</b>	<b>409</b>	<b>404</b>	<b>404</b>	<b>427</b>	<b>427</b>	<b>427</b>	<b>427</b>	<b>427</b>	<b>427</b>	<b>427</b>
<b>SPS Diversity Exchange</b>	-	-	<b>101</b>	<b>101</b>	<b>101</b>	<b>101</b>	<b>101</b>	<b>101</b>	<b>101</b>	<b>101</b>
<b>Net Dependable Capacity</b>	<b>7,591</b>	<b>7,588</b>	<b>7,502</b>	<b>7,451</b>	<b>7,564</b>	<b>7,601</b>	<b>7,380</b>	<b>7,127</b>	<b>7,040</b>	<b>7,068</b>


## 3. Planning Reserve Margins and Contingency Plans

There are no updates or changes to the planning reserve margin or contingency plans from those contained in the Company’s May 27, 2016 ERP filing.

#### 4. Updated Need for Additional Resources

Table 4 shows the Company's updated projection of resource need relative to the September 2016 demand forecast for the period 2016-2025.

Table 4 - Loads and Resources Table

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Net Dependable Capacity</b>	<b>7,591</b>	<b>7,588</b>	<b>7,502</b>	<b>7,451</b>	<b>7,564</b>	<b>7,601</b>	<b>7,380</b>	<b>7,127</b>	<b>7,040</b>	<b>7,068</b>
<b>PSCo Load</b>										
Native Load	6478	6565	6628	6682	6712	6846	6913	7051	7113	7187
Interruptible Load	537	555	575	598	623	623	623	623	623	623
<b>Firm Obligation Load</b>	<b>5,941</b>	<b>6,010</b>	<b>6,053</b>	<b>6,084</b>	<b>6,089</b>	<b>6,223</b>	<b>6,290</b>	<b>6,428</b>	<b>6,490</b>	<b>6,564</b>
<b>Planning Reserve Margin</b>										
Reserve Margin Requirement (MW)	968	980	987	992	993	1,014	1,025	1,048	1,058	1,070
IREA & HCEA Backup Reserves	40	40	40	40	40	40	40	40	40	40
<b>Reserve Margin Requirement</b>	<b>1,008</b>	<b>1,020</b>	<b>1,027</b>	<b>1,032</b>	<b>1,033</b>	<b>1,054</b>	<b>1,065</b>	<b>1,088</b>	<b>1,098</b>	<b>1,110</b>
Reserve Margin Actual	1,650	1,578	1,450	1,367	1,475	1,378	1,091	699	550	504
<b>Resource Position (MW) (need)</b>	<b>641</b>	<b>558</b>	<b>423</b>	<b>335</b>	<b>442</b>	<b>323</b>	<b>25</b>	<b>(389)</b>	<b>(548)</b>	<b>(606)</b>
										

#### Uncertainty in Phase II Resource/Capacity Need Assessment

As discussed on pages 1-33 and 1-34 of ERP Volume 1, there are a number of uncertainties (beyond normal load forecast uncertainty) that may affect the level of additional generation resources the Company acquires in Phase II of the 2016 ERP. These uncertainties could influence both the generation and load sides of the L&R balance in Table 4, and as a result impact the resource needs that will ultimately be filled in the Phase II process. Table 5 provides an updated summary of these uncertainties.

Table 5 - Approximate Uncertainty in Resource Need

Uncertainty	2018	2019	2020	2021	2022	2023	2024	2025
Renewable*Connect (if not approved)		+15	+16	+17	+18	+19	+20	+21
Incremental Customer Choice Solar (1)	+70	+110	+150	+190	+220	+260	+290	+320
Oil and Gas Load (High) (2)				+50	+60	+105	+125	+125
Oil and Gas Load (Low) (2)				-50	-60	-105	-125	-125
Integrated Volt/VAr Optimization Load Impact (3)		-10	-30	-40	-50	-50	-50	-50
Residential Demand Rate Load Impact (Low) (4)					-100	-100	-100	-100
Residential Demand Rate Load Impact (High) (4)					-300	-300	-300	-300
Notes:								
1) Total nameplate of customer choice solar assumed to be added from 2017-2025 is approximately 800 MW <sub>AC</sub>								
2) High/Low Oil and Gas Load sensitivities assume +/- 50% of expected impact respectively								
3) The Company has filed in Proceeding 16A-0588E a CPCN for distribution grid enhancements.								
4) Residential Demand Rates could be enabled by proposals included in Proceeding 16A-0588E.								

**5. Update on Acquisition of Generation Resources from 2013 All-Source Solicitation**

The 120 MW Comanche Solar facility, which was part of the Commission approved 2013 All-Source resource portfolio, was placed in-service on September 2, 2016. As a result, all of the generation resources contained in the Commission approved resource portfolio from the 2013 All-Source Solicitation are operational.

**6. Discussion of Emerging Issues that Could Impact the 2016 ERP Filing**

EPA's Proposed Clean Power Plan

As has been widely reported in popular and trade press, the Clean Power Plan (“CPP”) is under legal challenge from 27 states and a number of industry groups. The CPP has been stayed by the U.S. Supreme Court since February 9, 2016 while the U.S. Court of Appeals for the District of Columbia (“D.C. Circuit”) reviews the legality of the rule. On September 27, 2016, the D.C. Circuit heard oral arguments on the CPP. It is generally expected that the D.C. Circuit Court will issue its opinion in early 2017. At that time, the U.S. Supreme Court can decide whether to hear the case itself in 2017 or 2018. The stay will be lifted when either (1) the U.S. Supreme Court declines to hear the case, or (2) the U.S. Supreme Court issues a decision on the merits of the case. We will continue to monitor the D.C. Circuit outcome and U.S. Supreme Court activities, but we may not have final certainty on the CPP’s legal status before approximately June 2018. Lacking certainty on the fate or deadlines of the CPP, Colorado has not developed a state plan to implement the rule.

Despite lacking the details that a State compliance plan for Colorado would provide, the Company believes that its current plans/actions to: (1) take advantage of the recently extended federal PTCs through the construction of the 600 MW Rush Creek Wind Facility, (2) encourage bidders to offer additional cost effective utility-scale wind and solar resources into the Company in the Phase II acquisition process, (3) continue investing in Colorado consumers and providing them choices for their energy needs through the Company’s 2017 RE Plan, and (4) continue our efforts in the area of DSM and customer choice programs, will ultimately put Public Service and its customers in a better position to comply with the carbon dioxide emission reductions envisioned in the CPP or any other future state or federal carbon dioxide regulations.