

**REDACTED**

Rocky Mountain Power

Docket No. 17-035-39

Witness: Timothy J. Hemstreet

BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

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**REDACTED**

Supplemental Direct Testimony of Timothy J. Hemstreet

February 2018

1 **SUPPLEMENTAL DIRECT TESTIMONY OF TIMOTHY J. HEMSTREET**

2 **Q. Are you the same Timothy J. Hemstreet who previously provided testimony in this**  
3 **case on behalf of PacifiCorp dba Rocky Mountain Power (the “Company”)?**

4 A. Yes.

5 **PURPOSE AND SUMMARY OF SUPPLEMENTAL DIRECT TESTIMONY**

6 **Q. What is the purpose of your supplemental direct testimony in this proceeding?**

7 A. My supplemental direct testimony provides the latest technical and commercial  
8 information on the Company’s wind repowering project. This update includes  
9 developments since the Company’s rebuttal filing in October 2017, and surrebuttal  
10 filing in November 2017.

11 **Q. What are the key issues you address in your supplemental direct testimony?**

12 A. I provide an update on the following key issues:

- 13 • Changes in turbine specifications due to the completion of the technical review of  
14 all facilities that are proposed to be repowered;
- 15 • Changes in project costs and energy benefits as a result of the completion of  
16 technical design and foundation review for all of the facilities, and now-known  
17 transmission capacity increases;
- 18 • The status of project permitting and the contracting process the Company has  
19 undertaken for installation of turbines to be supplied by Vestas-American Wind  
20 Technology, Inc. (“Vestas”) to facilitate the repowering project; and
- 21 • Updated safe harbor cost sensitivity analysis and schedule for the repowering  
22 project.

23 **Q. Please summarize your testimony.**

24 A. Since rebuttal and surrebuttal testimony were filed in the fall of 2017, the Company  
25 has observed continued reduction in wind repowering project risks and uncertainties as  
26 the technical studies conclude and contracting progresses. The Company has a) updated  
27 its energy production estimates to reflect recent project-specific changes and additional  
28 available data, with only a small net change in production; b) confirmed the need and  
29 scope of required facility retrofits, with project costs remaining within 1.6 percent of  
30 estimates included in my rebuttal testimony; and c) completed significant permitting  
31 requirements for 11 of the 12 facilities. Despite the delay in the original procedural  
32 schedule in this case, the Company remains confident that it can qualify for the  
33 production tax credits ("PTCs"), and deliver the repowering project on-time at or below  
34 the cost estimates included here. Even after accounting for recent changes to the federal  
35 income tax rates, the customer benefits resulting from the repowering project remain  
36 robust and the Company remains on track to deliver these benefits to customers.

37 **UPDATE ON COST AND PERFORMANCE**

38 **Q. Have there been any changes to the Company's estimates of run-rate capital**  
39 **expenditures for the repowering or status quo cases as compared to the rebuttal**  
40 **filing?**

41 A. No. The Company's estimates of run-rate capital expenditures for both cases are  
42 unchanged.

43 **Q. Have there been any changes in the Company's operations and maintenance cost**  
44 **assumptions since the time of your rebuttal testimony?**

45 A. No. There have been no changes in operations and maintenance cost assumptions and

46 costs for the status quo case remain unchanged. However, the energy estimates for  
47 certain facilities have changed, as described later in my testimony. The operations and  
48 maintenance costs for the repowering case have adjusted slightly for those facilities as  
49 a result of changed land lease payments that are tied to energy production.

50 **Q. Have there been any changes to turbine specifications for the wind facilities since**  
51 **your previous testimony?**

52 A. Yes. The specified turbine for the Leaning Juniper facility has changed [REDACTED]  
53 [REDACTED]  
54 [REDACTED]

55 **Q. Why was this change made?**

56 A. As site-specific climactic conditions and design loads for this project site were  
57 evaluated and developed, the turbine supplier made the change to ensure the turbine  
58 loading is within the allowable load limits of the existing towers and foundations at the  
59 project site.

60 **Q. Does the reduction in nameplate capacity of the specified turbine type impact the**  
61 **amount of energy expected from this repowered facility?**

62 A. Yes. The reduction in nameplate capacity reduces the estimated generation increase of  
63 the repowered facility from 30.0 percent to 27.0 percent—a three percent reduction.

64 **Q. Has this reduction in energy been factored into the Company's economic analysis**  
65 **for this facility?**

66 A. Yes. The economic analysis of Company witness Mr. Rick T. Link accounts for the  
67 updated generation expected for the Leaning Juniper facility.

68 **Q. Does the change in turbine type for the Leaning Juniper facility impact the cost of**  
69 **repowering that facility?**

70 A. Yes. The change in turbine specification has also resulted in revised pricing from the  
71 turbine supplier that has lowered the costs for turbine supply at this project.

72 **Q. Are there any other changes to the estimated energy output from the repowering**  
73 **project, as compared to the estimates in your previous testimony?**

74 A. Yes. When my prior testimony was filed, only one year of historical data was available  
75 to estimate the energy increases for the Glenrock I, Glenrock III, and Rolling Hills  
76 facilities. Since then, the Company has been able to evaluate additional years of data  
77 for these facilities and complete further analysis. The Company's estimated energy  
78 increase for these facilities is now based on four years of historic data, consistent with  
79 the methodology and data history used for all the other facilities.

80 **Q. Has this changed the energy production estimates for the Glenrock I, Glenrock**  
81 **III, and Rolling Hills facilities?**

82 A. Yes, slightly. The estimated energy production for the Glenrock I, Glenrock III, and  
83 Rolling Hills facilities decreased by 1.1 percent, 0.5 percent, and 0.3 percent,  
84 respectively. These changes in the energy production estimates are shown in  
85 Confidential Exhibit RMP\_\_\_(TJH-1SD). These changes have also been factored into  
86 the Company's economic analysis presented in Mr. Link's supplemental direct  
87 testimony.

88 **Q. Are there any other changes in the energy production estimates included in this**  
89 **supplemental direct filing?**

90 A. Yes. Transmission studies for the Marengo I and Marengo II facilities have advanced

91 to the point where the Company is now confident that an interconnection agreement  
92 can be executed with the Company's transmission function that will allow the  
93 repowered Marengo facilities to deliver their full repowered energy capability to  
94 customers. This results in a 1.0 percent and 2.2 percent increase in the estimated energy  
95 production from the Marengo I and Marengo II facilities, respectively. The Company's  
96 economic analysis includes this increased energy production.

97 **Q. What is the net change in estimated energy production for the repowering project**  
98 **given decreases at Glenrock I, Glenrock II, Rolling Hills, and Leaning Juniper,**  
99 **and increases at Marengo I and Marengo II?**

100 A. There is only a small net change. In my previous testimony, I estimated an energy  
101 production increase of 25.9 percent for the repowering project; my current estimate is  
102 an energy production increase of 25.7 percent.

103 **Q. Have the costs for the required transmission system modifications for the**  
104 **Marengo facilities been factored into the financial analysis?**

105 A. Yes. The costs for the required transmission system modifications needed to  
106 interconnect this additional capacity--which the transmission studies have estimated at  
107 \$180,000--are now included in the cost estimates for the Marengo facilities included in  
108 this supplemental direct filing.

109 **Q. Does the Company now know whether the transmission interconnection**  
110 **agreements at the other facilities can be modified to increase the amount of energy**  
111 **that can be delivered from those facilities?**

112 A. No. Transmission studies have not yet advanced at the Wyoming wind facilities to the  
113 point where the Company knows whether this additional capacity will be available for

114 these facilities. For this reason, the Company's economic analysis still shows the  
115 Wyoming projects operating under their current interconnection agreement limits.  
116 Finally, the Company does not anticipate additional transmission capacity will be  
117 available for the Leaning Juniper and Goodnoe Hills facilities due to transmission  
118 constraints.

119 **Q. Has the Company now completed an evaluation of the foundations at all wind**  
120 **repowering sites and confirmed that the foundations are suitable for the new**  
121 **turbines?**

122 A. Yes. Since my prior testimony was filed, site-specific turbine design and foundation  
123 analyses have now been completed for the Goodnoe Hills and Leaning Juniper  
124 facilities. When my prior testimony was filed, site-specific foundation load  
125 specifications for these facilities were not yet available and the Company had not yet  
126 verified that the foundations at these facilities were suitable for the specified  
127 repowering turbines. Black & Veatch, Inc., has now evaluated the foundations at the  
128 Leaning Juniper and Goodnoe Hills facilities and determined that the foundations will  
129 be suitable for the repowered turbines following a standard retrofit that will add  
130 strength to these foundations. This strengthening will allow the foundations to resist  
131 the loads of the larger turbines for an additional 30-year service life following  
132 repowering, similar to all the other facilities previously evaluated.

133 **Q. Was the cost of these foundation retrofits previously included in the Company's**  
134 **cost estimates for the Leaning Juniper and Goodnoe Hills facilities?**

135 A. No. The cost was not included because we did not know the retrofits would be  
136 necessary. The Company has now included the estimated cost of these foundation

137 retrofits into the costs for these repowered facilities, which have been evaluated in the  
138 project-by-project economic analysis described in the testimony of Mr. Link. Changes  
139 in project costs as compared to those in my prior testimony are also shown in  
140 Confidential Exhibit RMP\_\_\_\_(TJH-1SD). The only material cost changes are  
141 associated with the Marengo facilities, for increased interconnection agreements and  
142 updated installation costs, and Leaning Juniper and Goodnoe Hills, reflecting the costs  
143 of foundation retrofits and updated turbine installation costs. In addition, the reduction  
144 in turbine supply costs for Leaning Juniper offsets the cost increases for this facility.

145 **Q. How much have project costs increased as compared to costs included in your**  
146 **prior testimony?**

147 A. Project costs have increased by \$17.6 million—or approximately 1.6 percent—to \$1.10  
148 billion for the Company’s base repowering scenario which assumes transmission  
149 interconnection agreements in Wyoming are not modified. The Company continues to  
150 expect \$36 million in project upgrade costs to allow the Wyoming facilities to deliver  
151 additional energy under modified interconnection agreements, for a total cost of \$1.137  
152 billion. As before, ongoing transmission studies will determine the costs of any  
153 necessary upgrades to the transmission system to interconnect this additional project  
154 capacity.



155 **Q. Given the increased costs for the projects that will employ Vestas turbines (i.e.,**  
156 **Leaning Juniper, Goodnoe Hills, Marengo I, and Marengo II), is the Company**  
157 **still confident that it will have sufficient safe harbor wind turbine generator**  
158 **equipment purchased in 2016 to satisfy the five percent safe harbor requirement**  
159 **and qualify the projects for 100 percent of the value of the PTCs?**

160 A. Yes. As a result of the increased costs of repowering the Goodnoe Hills facility due to  
161 the necessary foundation retrofit, the Company has changed its allocation of safe harbor  
162 nacelles to increase the number of nacelles for the Goodnoe Hills facility. This will  
163 allow all wind facilities to maintain an adequate safe harbor percentage so that project  
164 costs that are not yet contractually fixed could escalate 65 percent or more with the  
165 facilities still having sufficient safe harbor equipment. Table 1 below shows the cost  
166 overrun sensitivity of the various facilities, similar to that provided in my rebuttal  
167 testimony, and demonstrates that all facilities have adequate safe harbor equipment. As  
168 discussed in my rebuttal testimony, the Company also has access to additional Vestas  
169 safe harbor equipment from Berkshire Hathaway Energy of the same type as the safe  
170 harbor nacelles purchased for the repowering project in December 2016. If necessary,  
171 the Company can supplement the safe harbor equipment in order to ensure there is  
172 adequate safe harbor equipment to qualify for 100 percent PTCs.

173

**Confidential Table 1**

174 **Cost Overrun Sensitivity of Repowering Facilities to Meet Five Percent Safe Harbor**

Wind Project	Total Project Cost Applicable to Five Percent Safe Harbor	Current Safe Harbor Percentage (%)	Cost that are Fixed with Turbine Suppliers (\$000s)	Turbine Supplier Fixed Costs (%)	Costs Not Yet Contractually Fixed (\$000s)	Amount that Non-Fixed Costs Can Increase and Meet 5% Safe Harbor (%)
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	5300%
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	5200%
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	4800%
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	4400%
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	4000%
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	3450%
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	3450%
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	3300%
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	175%
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	110%
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	100%
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	65%

175

**UPDATE ON PERMITTING AND CONTRACT STATUS**

176 **Q. Since the Company’s rebuttal filing, has progress been made on permitting for the**  
177 **Company’s repowering project?**

178 **A.** Yes. Since the Company filed rebuttal testimony, Klickitat County, Washington has  
179 determined that no additional permitting through its Planning Department is necessary  
180 for the Company’s proposed repowering of the Goodnoe Hills facility. With this  
181 approval, 11 of the 12 facilities have been approved by the relevant county or Industrial  
182 Siting Division. The Company does not anticipate any issues with obtaining the  
183 remainder of any necessary permits and authorizations.

184 **Q. In your October 2017 rebuttal testimony, you noted the Company had not**  
185 **executed a contract for the installation services for facilities employing Vestas**  
186 **turbines. (Hemstreet Rebuttal, lines 95-106.) What is the status of that process?**

187 A. The Company issued a request for proposals in early December 2017 and received  
188 qualified bids for installation of Vestas turbines from several wind energy construction  
189 contractors in mid-January 2018. The Company is still evaluating these proposals to  
190 determine which proposal provides the best value to customers.

191 **Q. Has the Company factored the information gained from the responsive bids into**  
192 **its cost estimates for constructing the facilities employing Vestas turbines?**

193 A. Yes, the Company's cost estimates have been updated to reflect cost information gained  
194 through the competitive bid process for installation, foundation retrofits (where  
195 necessary), and other site construction services that will be provided by the successful  
196 wind energy contractor.

197 **Q. When factoring in cost information from the competitive bids for installation and**  
198 **foundation retrofit work (where necessary) for the Vestas projects, did the**  
199 **Company simply take the costs from the lowest bid and incorporate that into the**  
200 **Company's cost estimates?**

201 A. No. Because the Company has not yet fully evaluated the bids or completed  
202 negotiations with the bidders, the Company did not simply rely on the lowest bid  
203 submitted to develop its revised cost estimates. Instead, the Company excluded the low  
204 bid in the event it was non-responsive and used pricing reflective of the average of the  
205 next three lowest cost proposals. For this reason, I am confident that these construction  
206 services can be contracted at pricing equal to or better than the pricing included in the

207 Company's current cost estimates.

208 **Q. When does the Company anticipate having the construction contract for the**  
209 **Vestas turbines completed?**

210 A. The Company expects to have a fully negotiated construction contract with the  
211 successful bidder completed by the end of March 2018.

212 **Q. Given the delay in the schedule of this proceeding to allow recent tax law changes**  
213 **to be factored into the Company's economic analysis, do you foresee schedule risks**  
214 **that may now impact the ability of the repowering project to be constructed in the**  
215 **timeframe originally described in your direct testimony?**

216 A. No. The Company continues to work with its turbine suppliers—General Electric, Inc.  
217 and Vestas—to ensure timely delivery of the repowering project while accommodating  
218 the delay in this proceeding. At this time, the construction schedule for the projects,  
219 which shows completion of all facilities in 2019 except Dunlap, remains achievable  
220 given the anticipated timing for the Commission's final order on the Company's  
221 request. An updated project schedule for the repowering project is included in  
222 Confidential Exhibit RMP\_\_\_(TJH-2SD).

223 **Q. With the recent tax law changes, are you aware of any provisions that have**  
224 **changed the ability of the facilities to qualify for the full value of PTCs as**  
225 **described in your direct and rebuttal testimony?**

226 A. No. As more fully described by Company witness Ms. Nikki L. Koblaha, the recent tax  
227 law changes have not impacted the ability of the repowering project to qualify for the  
228 full value of PTCs under Internal Revenue Service guidance (including the safe harbor  
229 requirements or the 80/20 rule).

230 **Q. Does this conclude your supplemental direct testimony?**

231 A. Yes.