

**REDACTED**

Docket No. 20000-519-EA-17

Witness: Timothy J. Hemstreet

BEFORE THE WYOMING PUBLIC SERVICE  
COMMISSION

ROCKY MOUNTAIN POWER

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**REDACTED**

Rebuttal Testimony of Timothy J. Hemstreet

November 2017

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

4 A. Yes.

5 **PURPOSE AND SUMMARY OF REBUTTAL TESTIMONY**

6 **Q. What is the purpose of your rebuttal testimony?**

7 A. I provide an update on the technical and commercial aspects of the Company’s wind  
8 repowering project, demonstrating the project’s increasing value and decreasing risk. I  
9 also respond to the direct testimony of Wyoming Industrial Energy Consumers  
10 (“WIEC”) witness Mr. Kevin C. Higgins and Wyoming Office of Consumer Advocate  
11 (“OCA”) witness Ms. Denise K. Parrish.

12 **Q. What are the key issues you address in your rebuttal testimony?**

13 A. I address the following key issues:

- 14 • A description of the fully negotiated contracts with General Electric  
15 International, Inc. (“GE”) and Vestas-American Wind Technology, Inc.  
16 (“Vestas”) for the wind repowering project, and associated cost-savings.
- 17 • An update on the wind turbine generator equipment specified for the wind  
18 repowering project and the increased generation benefits now anticipated as a  
19 result of changes to that equipment.
- 20 • A summary of the Company’s significant efforts to date and its future plans to  
21 minimize risk associated with the wind repowering project to ensure that the  
22 project will deliver the anticipated benefits.

- 1 • The timing and process leading up to the Company’s decision to execute safe-  
2 harbor equipment-purchase contracts in late 2016, the evaluation of the  
3 repowering project in the Company’s integrated resource planning process, and  
4 the appropriateness of the Wyoming Public Service Commission’s  
5 (“Commission”) review of the wind repowering resource decision.

6 **Q. Please summarize your testimony.**

7 A. The Company has continued to work diligently on the wind repowering project to  
8 deliver benefits to its customers. The Company has finished negotiating a master  
9 retrofit contract with GE and a turbine supply contract with Vestas. The negotiated  
10 contract provisions reduce the initial estimated cost of the repowering project, increase  
11 the generation output, and reduce or eliminate various project risks. In addition, the  
12 Company has now completed most of its siting and permitting work, clearing this  
13 important project hurdle.

14 The OCA is generally supportive of the project, while raising some concerns  
15 about project risks and cost recovery. WIEC does not specifically oppose or support  
16 the Company’s proposal but offers several recommendations if the Commission  
17 approves the project, mostly related to project risk and process issues. My testimony  
18 addresses these recommendations and the general concerns raised by the OCA. I show  
19 that the Company has comprehensively managed the risks of the wind repowering  
20 project, and the risks are outweighed by the customer benefits from repowering. I also  
21 demonstrate that the Company timely raised wind repowering in its 2017 Integrated  
22 Resource Plan (“IRP”), and has appropriately invoked the resource approval statute to  
23 obtain Commission review and approval of wind repowering.

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**UPDATE ON STATUS OF CONTRACTS**

**Q. Is the Company negotiating turbine supply and installation agreements for the wind repowering project?**

A. Yes. The Company is negotiating contracts with GE for the [REDACTED] of the twelve facilities with GE equipment, and with Vestas for the other [REDACTED] projects. The scope and language of the agreements with each of the companies is different, with GE providing a turn-key agreement and Vestas supplying equipment that will be installed under a separate agreement. The Company is still in the process of obtaining a contract for installation of the Vestas equipment. The Company’s contractual risk mitigation provisions differ depending on the equipment manufacturer involved.

**Q. At the time you prepared your direct testimony, the Company was still negotiating a turn-key agreement with GE for the wind repowering project employing GE equipment. Has the Company now completed these negotiations?**

A. Yes. The Company has completed negotiating a master retrofit contract that commits GE to perform turn-key supply, delivery, installation and commissioning of the repowering turbines at a fixed price.

**Q. Does the fully negotiated GE retrofit contract reflect differences in pricing compared to the previous estimate used in the Company’s economic analysis?**

A. Yes. The negotiated contract reduces the pricing for those wind facilities that will be repowered using GE turbines.

1 **Q. Does the fact that the Company has fully negotiated the GE retrofit contract mean**  
2 **that the Company has committed to move forward with the wind repowering**  
3 **project regardless of the Commission’s determination in this case?**

4 A. No. The GE retrofit contract provides an off-ramp if the Company does not obtain  
5 regulatory approval for the repowering project or any approval that includes conditions  
6 that present a material concern to the Company in moving forward with the repowering  
7 project.

8 **Q. Does the GE retrofit contract provide other off-ramps to address potential**  
9 **changes in circumstances that may affect the economics of the wind repowering**  
10 **project or the ability of the Company to execute the project as currently**  
11 **anticipated?**

12 A. Yes. Before issuance of a retrofit work order directing GE to repower a facility, the  
13 contract allows the Company to decide not to proceed with the retrofit work for a  
14 number of reasons, including:

- 15 • Situations in which the Company was unable to timely obtain any required  
16 permit, or if the terms and conditions imposed by a permit are unacceptable to  
17 the Company;
- 18 • For technical reasons related to the suitability of the new turbines for the site or  
19 existing foundations; or
- 20 • The Company’s determination that changes in local, state, or federal law or  
21 corporate tax law create a material risk to the project; or if the federal production  
22 tax credit (“PTC”) law or Internal Revenue Service (“IRS”) guidance regarding

1 PTCs (including the safe-harbor requirements or the 80/20 Rule) is adversely  
2 modified, amended, or changed.

3 **Q. When does the Company anticipate issuing its first retrofit work order to repower**  
4 **a GE facility?**

5 A. The first retrofit work order is expected to be issued in [REDACTED] to allow turbine  
6 delivery to begin in time to support repowering of facilities in 2019.

7 **Q. If a retrofit work order is issued to GE for a facility and there are subsequent**  
8 **changes in tax laws, PTC rules, or permitting requirements, what recourse does**  
9 **the Company have once those off-ramps are no longer automatically available to**  
10 **the Company?**

11 A. Following the issuance of a retrofit work order, the GE retrofit contract has provisions  
12 that allow the Company to terminate the retrofit work order for convenience at known  
13 costs that escalate from the date the retrofit work order is executed up to the date of the  
14 first anticipated turbine delivery. Thus, the Company will still have the ability to  
15 respond to potential legal or regulatory changes that impact the value of the GE  
16 repowering facilities.

17 **Q. Has the Company also completed negotiations on a turbine supply contract with**  
18 **Vestas?**

19 A. Yes. The Company has completed negotiations with Vestas and has fixed pricing for  
20 turbines ordered [REDACTED]

21 [REDACTED] This will allow the Company to assess  
22 any legal or regulatory changes that occur before that date and confirm that the Vestas  
23 facilities remain economic to repower.

1 **Q. Do the two contracts with the turbine suppliers provide for the costs of the**  
2 **turbines (and installation in the case of GE) to be adjusted up or down for factors**  
3 **such as inflation, currency indexes, or steel price indexes?**

4 A. No. The contracts provide that the prices are fixed and have no such adjustment  
5 mechanisms for those common price indexes. Generally, the turbine suppliers can only  
6 seek a change order for price relief as a result of changes in state and/or local law that  
7 impacts their costs.

8 **UPDATE ON TURBINE SPECIFICATIONS AND ENERGY OUTPUT**

9 **Q. Please provide an update on the turbine equipment specified for use in the wind**  
10 **repowering project.**

11 A. In my direct testimony, I noted that GE was developing a 91-meter rotor for repowering  
12 at wind facilities, like the Company's, that currently have GE 1.5 MW, 77 meter SLE  
13 turbines installed. GE finished developing this rotor and has completed the engineering  
14 and design review on a [REDACTED] turbine, which the Company  
15 can use to repower its [REDACTED]. The nameplate capacity of the  
16 generator of this turbine is [REDACTED] megawatts greater than the [REDACTED] turbine previously  
17 specified.

18 **Q. Has GE evaluated this new turbine to ensure it can be used to repower the**  
19 **Company's [REDACTED]?**

20 A. Yes. GE has completed a mechanical loads analysis for the new turbine type at each of  
21 the Company's [REDACTED] sites. The mechanical loads analysis is an  
22 engineering study to assess the site-specific climatic conditions and turbine loading to  
23 verify that the turbine is suitable for use at the facility site with the existing towers.

1 **Q. Has the Company also verified that the existing foundations at these wind facilities**  
2 **are suitable for use with the new turbine, which may have different loading due to**  
3 **the larger rotors?**

4 A. Yes. The Company's consultant, Black & Veatch, reviewed the new foundation loading  
5 at each facility site and determined that the existing foundations at the facilities can  
6 support the new turbines.

7 **Q. Does the change in turbine specification for the wind facilities require**  
8 **modification to the nacelles purchased to meet safe-harbor requirements?**

9 A. No. The existing nacelles the Company acquired from GE in December 2016 can be  
10 operated as a [REDACTED] turbine.

11 **Q. What are the energy benefits of this new turbine type?**

12 A. The increase in rotor diameter allows the wind turbine to capture additional wind  
13 energy, while the higher nameplate capacity allows the turbine to convert more of that  
14 available wind energy into electrical energy at higher wind speeds. Previously, the  
15 Company expected the generation output of the wind facilities to be fitted with GE  
16 [REDACTED] wind turbines to increase by 13.3 percent. The new GE [REDACTED] wind turbine  
17 results in an increase of 22.4 percent. Confidential Exhibit RMP\_\_\_\_(TJH-1R) provides  
18 an update on the energy estimates for the repowering project.

19 **Q. Does this new turbine selection for the wind facilities require additional**  
20 **modifications, like changes in the towers, substations, or the energy collector**  
21 **systems?**

22 A. No. If operated within the limits of the existing large generator interconnection  
23 agreements, the Company does not anticipate that any such modifications are

1 necessary.

2 **Q. What is the net result of the changes in equipment specifications to the amount of**  
3 **additional energy expected to be produced as a result of repowering?**

4 A. Assuming the generation interconnection agreements of the projects are not modified,  
5 the repowering project is estimated to result in an additional 743 gigawatt-hours  
6 (“GWh”) of energy annually, or an overall increase of 25.9 percent. This compares to  
7 the 551 GWh and 19.2 percent increase in energy output estimated previously in the  
8 Company’s application. If the generation interconnection agreements are modified to  
9 allow all of the turbines to operate at their full nameplate capability during periods of  
10 higher winds, the generation benefits increase to 862 GWh, or 30.0 percent.

11 **Q. Given the changes in turbine equipment that can generate additional energy, have**  
12 **the estimated costs of the repowering project increased?**

13 A. No. The Company has fixed pricing for the turbines from GE and Vestas and for  
14 installation of the GE project turbines. Costs for turbine supply at each facility have  
15 either not changed from prior estimates or decreased. As a result, the total cost of the  
16 repowering project is now \$1.083 billion—a reduction in cost of \$45 million.  
17 Confidential Exhibit RMP\_\_\_\_(TJH-2R) shows the updated project costs on a facility-  
18 by-facility basis.

19 **Q. If the generation interconnection agreements are modified, does the Company**  
20 **expect there will be additional costs to realize that additional generation?**

21 A. Yes. Due to the higher nameplate capacity of the GE [REDACTED] turbines, the Company  
22 will need to replace the turbine pad-mount transformers, upgrade some segments of the  
23 collector systems, and retrofit or replace certain generator step-up transformers to allow

1 the turbines to operate at full capacity. The Company expects the total cost of these  
2 upgrades to increase project costs by \$36 million, for a total cost of approximately  
3 \$1.119 billion. In addition, ongoing transmission studies will determine the costs of  
4 interconnecting the additional project capacity to the transmission system.

5 **Q. WIEC witness Mr. Higgins recommends against recovery of the costs of the two**  
6 **reliability features (WindFree™ and WindInertia™) described in your direct**  
7 **testimony unless the Company demonstrates that they are cost-effective. (Higgins**  
8 **Direct, page 31, lines 9-10.) Has the Company's updated analysis based upon the**  
9 **new turbine type addressed this concern?**

10 A. Yes. As part of the upgrade to the new GE [REDACTED] turbine, these two reliability features  
11 [REDACTED]  
12 [REDACTED]  
13 [REDACTED]  
14 [REDACTED]

15 **Q. Are there other updates to the project since the Company filed its application that**  
16 **address concerns raised by Mr. Higgins?**

17 A. Yes. Mr. Higgins notes that equipment performance and maintenance costs may differ  
18 from the Company's assumptions, creating risk related to delivering the assumed  
19 benefits from repowering. (Higgins Direct, page 24, lines 20-22; page 25, lines 1-5.)  
20 To mitigate these risks, the Company has negotiated a [REDACTED]  
21 [REDACTED]  
22 [REDACTED]  
23 [REDACTED]

1 [REDACTED]  
2 [REDACTED]  
3 [REDACTED]  
4 [REDACTED]  
5 [REDACTED].  
6 [REDACTED]  
7 [REDACTED]  
8 [REDACTED]  
9 [REDACTED]  
10 [REDACTED]  
11 [REDACTED]  
12 [REDACTED]  
13 [REDACTED]  
14 [REDACTED]

15 **Q. Does the Company's updated economic analysis reflect the costs of this fully**  
16 **negotiated contract?**

17 **A.** Yes. The Company's updated economic analysis reflects higher operations and  
18 maintenance costs for [REDACTED] and reduced capital expenditures at the projects  
19 [REDACTED] Capital expenditures are reduced for the [REDACTED]  
20 [REDACTED]  
21 [REDACTED]

1 [REDACTED]  
2 [REDACTED]  
3 [REDACTED]  
4 [REDACTED]  
5 [REDACTED]  
6 [REDACTED]  
7 [REDACTED]  
8 [REDACTED]

9 **Q. Are all of these changes reflected in the economic analysis in the rebuttal testimony**  
10 **of Company witness Mr. Rick T. Link?**

11 A. All of the costs associated with these changes are reflected in the updated economic  
12 analysis described by Mr. Link. However, the Company did not receive verification  
13 from GE that the [REDACTED] turbine was technically suitable for its repowering project  
14 until October 6, 2017. As a result, Mr. Link’s detailed analysis evaluates the energy  
15 output assuming a GE [REDACTED] turbine is used on sites that will be repowered with GE  
16 equipment instead of a GE [REDACTED] turbine. While the [REDACTED] turbine has the same cost  
17 as the GE [REDACTED] turbine, Mr. Link’s analysis does not reflect the higher energy output  
18 as a result of [REDACTED], so it conservatively estimates the generation  
19 benefits.



1 defined and the vast majority of each facility's repowering costs are now fixed under  
2 the Company's negotiated contracts.

3 **Q. Mr. Higgins also argues that there is a customer risk related to the potential that**  
4 **the actual capacity factors for the repowered facilities will be lower than expected**  
5 **(Higgins Direct, page 26, line 15 to page 27, line 2.) Is this a material risk?**

6 A. No. As Mr. Higgins acknowledges, the Company's post-repowering estimates of  
7 energy production are based on the actual operating history of the wind facilities, not  
8 on modeled assumptions of the wind resource available at the sites, the operational  
9 availability of the equipment, or other assumed conditions. The Company worked with  
10 its consultant, Black & Veatch, to use the extensive data history from the Company's  
11 facilities to derive precise estimates of the energy production expected from  
12 repowering. This analysis used more than 160 million data points from the operational  
13 record of the wind facilities and incorporated additional modeled wake losses  
14 anticipated from the new equipment. The results reflect as accurately as possible the  
15 energy production that would have occurred from the repowered turbines under the  
16 same operational conditions and availability as the existing equipment. Thus, the  
17 Company's repowering energy estimates do not rely upon assumptions about the wind  
18 conditions that are expected to exist at the projects—as was necessary before the  
19 projects were constructed—but are based upon actual experience. In addition, the  
20 energy estimates are not based upon assumptions of improved equipment availability  
21 as compared to the Company's actual experience.

22 **Q. Do you believe these repowering energy estimates to be conservative?**

23 A. Yes. The estimates reflect the generation increase that is expected to occur solely based

1 on the different equipment performance specifications of the newer equipment. As  
2 described above, the generation estimates do not reflect any improvements in the  
3 operational availability of the wind facilities from repowering. I expect that the  
4 availability of the wind turbines will improve after repowering given the additional  
5 sensors and condition monitoring systems in the repowered turbines that should allow  
6 for improved diagnostics and implementation of preventative maintenance measures  
7 that can reduce turbine down-time. Additionally, given the [REDACTED]

8 [REDACTED]  
9 [REDACTED] I anticipate the production-based availability of the projects may  
10 increase, resulting in more generation under similar wind conditions as compared to  
11 the past.

12 **Q. Mr. Higgins claims that the Company’s prior estimated capacity factors have been**  
13 **“overly optimistic” and implies that the same could be true here (Higgins Direct,**  
14 **page 27, lines 19-22.) Are prior estimates relevant here?**

15 A. No. As just explained, the Company is not estimating generation output here based  
16 modeled assumptions based on limited wind data, as it must do with a new facility.  
17 Instead it is using actual historical generation, which increases the accuracy of the  
18 projection. While Mr. Higgins is correct that—taken as a whole—the Company’s  
19 earlier estimates of energy production from its owned wind projects were higher than  
20 the actual production, this is not true for the Company’s more recent projects. Four of  
21 the last five wind projects brought online exceeded their projected capacity factors.  
22 These last five wind projects (Glenrock III, Rolling Hills, High Plains, McFadden

1 Ridge, and Dunlap) had a combined predicted net capacity factor of 34.1 percent,  
2 whereas the actual combined capacity factor for these projects is 35.5 percent.

3 **Q. Other than comparing pre-construction modeled capacity factors to post-**  
4 **construction actual capacity factors from the Company's wind projects, does Mr.**  
5 **Higgins indicate there may be a bias in the Company's energy production**  
6 **estimates for repowering?**

7 A. No. Mr. Higgins does not raise any other potential issues regarding the Company's  
8 energy estimates that would create a bias towards an over-prediction of the energy  
9 benefits of repowering, and he admits that his sensitivity analysis is a "what if" exercise  
10 and not a prediction (Higgins Direct, page 28, line 5.)

11 **Q. Mr. Higgins also recommends conditions for the Commission to impose if it**  
12 **approves repowering (Higgins Direct, page 5, lines 6-17.) Are these proposed**  
13 **conditions reasonable?**

14 A. No. Mr. Higgins recommends that if the Commission approves the Company's  
15 application, it should be predicated on "the Company's ability to demonstrate that  
16 construction costs have come in at or below those estimated, that the projects were  
17 completed as scheduled, and that, measured over a reasonable period of time, the  
18 megawatt hours produced by the repowered facilities are equal to or greater than the  
19 forecasted production provided in this proceeding." (Higgins Direct, page 5, lines 8-  
20 12.) Mr. Higgins suggests these conditions are required to better balance project risks  
21 between the Company and its customers.

22 None of these conditions are reasonable or appropriate. As Company witness  
23 Ms. Cindy A. Crane explains in her rebuttal testimony, the Company is expressly

1 assuming the risk of executing the wind repowering project in a manner that delivers  
2 PTC benefits to customers, based on currently known variables within the Company's  
3 control. This includes managing total project costs to meet the safe-harbor requirement  
4 and 80/20 tests, and completing repowering by 2020.

5 The Company has a strong incentive to successfully execute the repowering  
6 project and deliver PTC and other benefits to customers. Mr. Higgins' conditions are  
7 unnecessary to protect customers and may have the opposite effect by unreasonably  
8 limiting the Company's ability to implement repowering in the most cost-effective  
9 manner.

10 **Q. Please describe your concerns related to the proposed construction cost guarantee.**

11 A. The Company has prudently mitigated the risk of construction cost over-runs by  
12 negotiating largely fixed-cost contracts, as I describe above. There is a relatively small  
13 risk that construction costs will be higher than estimated under such contracts,  
14 especially because the Company must monitor costs closely to ensure PTC  
15 qualification. Instead of Mr. Higgins' proposal, the Company recommends that the  
16 Commission approve the updated facility-by-facility cost estimates I sponsor in  
17 Confidential Exhibit RMP\_\_\_\_(TJH-2R) to my testimony. Parties will have the ability  
18 to review all actual costs, including if costs exceed the approved estimates, for prudent  
19 implementation before the amounts are reflected in rates through the Resource  
20 Tracking Mechanism.

21 **Q. Do you have any other concerns related to Mr. Higgins' proposed construction**  
22 **cost guarantee?**

23 A. Yes. The Company anticipates that additional customer benefits could accrue to the

1 repowering project if the wind facilities are able to be operated under modified large  
2 generator interconnection agreements, as described in the rebuttal testimony of Mr.  
3 Link. The additional benefits of this scenario come with additional construction costs -  
4 and potentially transmission system upgrade costs that are unknown at this time. It is  
5 unreasonable for Mr. Higgins to suggest capping construction costs estimates when  
6 additional customer benefits may be realized with an increase in those costs.

7 If the Company does incur additional expenses above the approved cost  
8 estimates, we will be prepared to demonstrate the prudence of these additional  
9 expenses. Rather than imposing a hard cap, which may ultimately backfire and harm  
10 customers, the Company's approach provides flexibility to maximize customer benefits  
11 while ensuring that the parties and the Commission have a full opportunity to review  
12 all repowering costs in excess of the estimates included here.

13 **Q. Is there a material risk that construction delays will harm customers?**

14 A. No. The primary risk associated with construction delay relates to the ability of the  
15 repowered facilities to qualify for full PTC benefits. But, as noted above, for the [REDACTED]  
16 [REDACTED] wind facilities, the Company already has a fully negotiated contract with GE  
17 to perform repowering on a turn-key basis and thus has secured the equipment and  
18 resources to complete those projects. The Company has also negotiated a turbine supply  
19 contract with Vestas and will be able to secure those turbines. GE will be contractually  
20 obligated to complete repowering by guaranteed completion dates that will be specified  
21 by the Company. The Company plans to complete seven of the [REDACTED] facilities before  
22 the end of 2019—a year ahead of the required December 31, 2020 deadline for the  
23 repowered facilities to achieve commercial operation. Thus, there is little risk of those

1 facilities not meeting the 2020 deadline. The Dunlap facility is the only facility the  
2 Company is planning to repower in 2020 to avoid significantly truncating the existing  
3 PTCs from that facility.

4 **Q. Does the Company have any remedies if GE does not meet a guaranteed turbine-**  
5 **completion date for a wind facility?**

6 A. Yes. If the delay is not caused or otherwise agreed to by the Company or certain strictly  
7 limited “excusable delay” events, and the Company has met its contract requirements,  
8 GE will be required to pay liquidated damages to the Company of [REDACTED] per day for  
9 any turbine that is not completed by a guaranteed turbine-completion date, [REDACTED]

10 [REDACTED] In addition, as  
11 discussed in more detail below, if there is any slip in the turbine-completion date  
12 beyond December 31, 2020, [REDACTED]

13 [REDACTED] These mechanisms in the GE contract create a  
14 powerful incentive for GE to maintain the contractual schedule.

15 Moreover, under the terms of the GE retrofit contract, [REDACTED]  
16 [REDACTED]  
17 [REDACTED]  
18 [REDACTED]  
19 [REDACTED]  
20 [REDACTED]  
21 [REDACTED]  
22 [REDACTED]

1 [REDACTED]

2 [REDACTED]

3 Q. [REDACTED]

4 [REDACTED]

5 [REDACTED]

6 [REDACTED]

7 [REDACTED]

8 [REDACTED]

9 [REDACTED]

10 [REDACTED]

11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14 [REDACTED]

15 [REDACTED]

16 [REDACTED]

17 [REDACTED]

18 [REDACTED]

19 [REDACTED]

20 [REDACTED]

21 [REDACTED]

22 [REDACTED]

1

[REDACTED]

2

[REDACTED]

3 Q.

**Is there any risk that the construction schedule would be delayed due to permitting issues?**

5 A.

No. The Company has now received notice from the Wyoming Siting Division that no amendments to its existing operating permits for the Wyoming wind facilities are necessary to complete the repowering project. Similarly, the Company has received notice from Columbia County, Washington, that its conditional use permit for the Marengo facility need not be modified and that no additional permits are needed to repower the facility. The Company now has the major permit authorizations for 10 of the 12 facilities proposed for repowering. I do not expect any issues in obtaining permits for the remaining two facilities.

13 Q.

**Are there other problems with the imposition of Mr. Higgins' proposed condition related to the construction schedule?**

15 A.

Yes. It may be prudent for the Company to alter its proposed construction schedule for the facilities to manage costs and risks. For instance, the Company may desire to adjust the construction schedules for the Vestas projects to stagger their in-service dates to accommodate the availability of the installation contractor that provides the most cost-effective installation pricing. Thus, there are scenarios in which the construction schedule is modified while not adversely impacting, and potentially increasing, customer benefits. The Company should have the discretion to make these adjustments while still ensuring the projects are placed in service in order to qualify for the PTC.

1 **Q. What is your concern regarding Mr. Higgins' condition related to performance?**

2 A. While the Company is confident in the analysis that developed the repowering energy  
3 production estimates—and believes those estimates may be conservative—wind  
4 production is variable due to variable wind conditions. Thus, Mr. Higgins' proposal that  
5 the megawatt-hours produced by the repowered facilities should equal or exceed the  
6 forecasted production over a reasonable range of time are impacted by conditions  
7 outside the Company's control. For instance, wind conditions are outside the  
8 Company's control and the megawatt-hours produced by the wind facilities are entirely  
9 dependent upon this variable. Thus, it will be difficult to assess a "reasonable amount  
10 of time" in which the impact of this variable is sufficiently averaged to provide a fair  
11 assessment of pre- versus post-repowering energy production under a megawatt-hour  
12 metric.

13 **Q. Is there a broader implication to Mr. Higgins' proposed conditions?**

14 A. Yes. Mr. Higgins' recommendation would call for the Commission to revisit its  
15 approval of repowering in the future and impute a penalty upon the Company if the  
16 actual performance of the asset is different than expected when the decision was taken  
17 (based on information the Company knew at the time). Mr. Higgins' recommendation  
18 has far reaching implications. Aside from the fact that his suggestion lacks symmetry  
19 (*i.e.*, the Company is not rewarded for better-than-expected performance), Mr. Higgins'  
20 suggested policy fundamentally alters the premise that the Company's decisions are  
21 judged on the basis of what the Company knew at the time. There is no reason to believe  
22 that parties to a future rate proceeding would limit themselves to challenging only the  
23 performance of the repowered facilities. Mr. Higgins' recommendation opens the door

1 for reassessment of other decisions on an after-the-fact basis (*i.e.*, not just resource  
2 decisions but transmission, distribution, or any other decision impacting rates) and, as  
3 Mr. Higgins suggests, subjects the Company to one-sided disallowances.

4 **Q. Mr. Higgins notes that the Company has not assumed any salvage value for the**  
5 **equipment that will be removed as a result of repowering and suggests that the**  
6 **Company be required to demonstrate the diligence of its efforts to realize value**  
7 **from the removed equipment for the benefit of customers (Higgins Direct, page**  
8 **39, lines 15-21.) Do you agree with his recommendation?**

9 A. Yes. As noted in my direct testimony, there may be ways for the removed equipment to  
10 be used as spare parts to offset costs of maintaining existing turbines that will not be  
11 repowered or for it to be sold as spare parts or potentially redeployed. The Company  
12 will diligently pursue these alternatives, which have the potential to further enhance the  
13 customer benefits of the repowering project.

14 **Q. Mr. Higgins notes that repowering was not presented to IRP stakeholders until**  
15 **late in the IRP process (Higgins Direct, page 30, lines 5-10.) Could the Company**  
16 **have raised the wind repowering project early in the Company's 2017 IRP**  
17 **process?**

18 A. No. The technical analysis demonstrating that it was feasible to repower any of the  
19 Company's wind facilities was not completed until November 1, 2016. On that date,  
20 GE completed a mechanical loads analysis of the Rolling Hills project (66 turbines)  
21 and a portion of the Glenrock III project (13 turbines). Subsequent mechanical loads  
22 analysis was completed for Glenrock I (66 turbines) and the remainder of Glenrock III  
23 (13 turbines) on November 3, 2016, and for the Seven Mile Hill I and II projects on

1 November 7, 2016. Before this time, the Company did not know that repowering was  
2 feasible and did not have the information (*i.e.*, turbine types suitable for use in  
3 repowering, and their associated energy production) necessary to develop meaningful  
4 scenarios in the IRP.

5 **Q. If the Company knew that repowering was technically feasible for at least a subset**  
6 **of its Wyoming wind projects in early November 2016, why did it not develop a**  
7 **proxy repowering scenario to include in the IRP process or state that it was**  
8 **contemplating repowering its wind facilities during the Company’s November 17,**  
9 **2016 IRP public meeting?**

10 A. Although the Company knew in November 2016 that it was technically feasible to  
11 repower at least a portion of its Wyoming wind fleet, the Company had not completed  
12 negotiations with GE regarding equipment pricing, and it remained uncertain whether  
13 safe-harbor equipment was available—and to what extent—for delivery before the end  
14 of 2016. The Company also did not yet know whether repowering wind facilities with  
15 Vestas equipment was feasible since that technical analysis was not completed until  
16 December 22, 2016.

17 **Q. Are there other factors that impacted the Company’s ability to publicize its**  
18 **discussions with turbine suppliers at the end of 2016 or integrate repowering**  
19 **scenarios earlier in the IRP process?**

20 A. Yes. First, only the original equipment manufacturers of the Company’s wind turbines  
21 could complete the technical analysis validating whether repowering was technically  
22 feasible in time to acquire safe-harbor equipment in 2016. Thus, analysis of the  
23 repowering project within the IRP—had it been possible—would not have resulted in

1 modeling proxy resources but rather in identifying specific projects requiring  
2 equipment from individual equipment suppliers. Public modeling of the economics of  
3 repowering—and potentially individual projects—could have disadvantaged the  
4 Company’s negotiations with suppliers.

5 Second, safe-harbor WTG equipment was in short supply in late 2016 because  
6 it was the last year for wind projects to purchase equipment to qualify as having begun  
7 construction in 2016 and thereby qualify for 100 percent of the PTC. Thus, the  
8 Company was competing with other market participants to purchase limited  
9 safe-harbor equipment. Public information that the Company was considering  
10 repowering its wind fleet of known turbine types at known locations may have induced  
11 other market participants to evaluate repowering their own projects and could have  
12 resulted in greater competition for the limited safe-harbor equipment, increased prices,  
13 or limited turbine availability. This could have limited the Company’s options for wind  
14 repowering and reduced customers’ benefits.

15 **Q. Does this conclude your rebuttal testimony?**

16 A. Yes.

BEFORE THE PUBLIC SERVICE COMMISSION OF WYOMING

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IN THE MATTER OF THE )	
APPLICATION OF ROCKY MOUNTAIN )	
POWER FOR AN ORDER APPROVING )	DOCKET NO. 20000-519-EA-17
NONTRADITIONAL RATEMAKING )	(RECORD NO. 14780)
RELATED TO WIND REPOWERING )	

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AFFIDAVIT, OATH AND VERIFICATION

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Timothy J. Hemstreet (Affiant) being of lawful age and being first duly sworn, hereby deposes and says that:

Affiant is the Director of Renewable Energy Development for PacifiCorp, which is a party in this matter.

Affiant prepared and caused to be filed the foregoing testimony. Affiant has, by all necessary action, been duly authorized to file this testimony and make this Oath and Verification.

Affiant hereby verifies that, based on Affiant's knowledge, all statements and information contained within the testimony and all of its associated attachments are true and complete and constitute the recommendations of the Affiant in his official capacity as Director of Renewable Energy Development.

Further Affiant Sayeth Not.

Dated this 13<sup>th</sup> day of November, 2017

  
\_\_\_\_\_  
Timothy J. Hemstreet  
Director of Renewable Energy Development  
825 NE Multnomah, Suite 1500  
Portland, Oregon 97232  
(503) 813-6170

STATE OF Oregon )  
 ) SS:  
COUNTY OF Multnomah )

The foregoing was acknowledged before me by Timothy J. Hemstreet on this 13  
day of November, 2017. Witness my hand and official seal.

  
\_\_\_\_\_  
Notary Public

My Commission Expires: March 6, 2018

