BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

IN THE MATTER OF THE APPLICATION OF ROCKY MOUNTAIN POWER FOR APPROVAL OF A SINIFICANT ENERGY RESOURCE DECISION AND VOLUNTARY REQUEST FOR APPROVAL OF RESOURCE DECISION	))))))))))	**DOCKET NO. 17-035-40** **DPU Confidential** **Exhibit 2.0 R-SUP, 2.0 SR** **Testimony and Exhibits** **Daniel Peaco**

FOR THE DIVISION OF PUBLIC UTILITIES
DEPARTMENT OF COMMERCE
STATE OF UTAH

CONFIDENTIAL

Supplemental Rebuttal and Surrebuttal Testimony of

Daniel Peaco

On Behalf of the Division of Public Utilities

April 17, 2018

CONFIDENTIAL-SUBJECT TO UTAH PUBLIC SERVICE COMMISSION RULES 746-1-602 and 603

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I. Introduction

Q. Are you the same Daniel Peaco who previously provided direct testimony in this proceeding on behalf of the Utah Division of Public Utilities?

A. Yes. I submitted direct testimony on December 5, 2017 on behalf of the Division as DPU Confidential Exhibit 2.0 DIR and rebuttal testimony on March 16, 2018 as DPU Exhibit 2.0 SR.

Q. What is the purpose of your testimony today?

A. The purpose of my testimony is to address Rocky Mountain Power's (RMP or the "Company") current proposal for the new Wind and Transmission Projects (together, the Combined Projects). I am offering Surrebuttal Testimony addressing RMP's Rebuttal Testimony filed on January 16, 2018. In addition, I am offering Rebuttal Testimony addressing the new information offered by the Company in its Supplemental Direct Testimony filed on January 16, 2018 and updated in its Second Supplemental Direct Testimony filed on February 16, 2018.

Q. Please summarize your recommendations and conclusions.

A. Based on my review of the Company's Rebuttal, Supplemental Direct, and Second Supplemental Direct testimonies, I observe that:

- The Company's own economic analysis of the Combined Projects shows that its view of the net benefits of the current Combined Projects have declined from the Company's initial filing, now showing negative benefits in two scenarios and very limited net benefits in many others.

- The Company's 30-year economic analysis includes new, speculative benefits that overstate the overall value of the Combined Projects. The Company's 20-year analysis front-loads the benefits, causing those results to significantly overstate the actual net benefits of the Combined Projects. Further, the problems with the Company's methodology that I discussed in my Direct Testimony remain a problem in the Company's current analysis.

- The Company inappropriately includes the Uinta Wind Project in the economic benefits of the eastern Wyoming Wind Projects and the Transmission Projects, as that project does not require the Transmission Projects for interconnection to the grid.

- The Company asserts that ratepayers should bear a number of significant risks that are not within its control, including cost risks, production risks, schedule risks, and market risks.

- The Company's late-filed transmission planning studies do not support the Company's assertion that the 500 kV facilities remain adequate to deliver the eastern Wyoming short listed Wind Projects now included in the Company's proposal.

- The Company now asserts that the Wind Projects can qualify for all production tax credits (PTCs) even if the 500 kV Transmission Projects are not completed by December 31, 2020 but does not specifically specify the facilities that are essential by December 31, 2020 to achieve qualification.

- The Company has provided no information to demonstrate the need from the Transmission Projects in 2024 independent from the development of the Wind Projects.
- The Company now asserts that the Combined Projects are a needed capacity resource, rather than the economic opportunity claim made in the Company's original filing. The Company's assertion of resource need and the associated assertion that it does not need to demonstrate a high likelihood of customer benefits is not demonstrated by the Company's testimony.
- The Company has not provided a suitable evaluation of alternatives (including other wind projects, the Solar RFP, and alternative transmission solutions) to demonstrate that the Combined Projects are the lowest cost resources to meet the resource need that is now asserted.

I conclude that the Company's economic benefits are significantly overstated and that the eastern Wyoming Wind and Transmission Projects do not provide a sufficiently high likelihood of benefits to be approved. The Commission should consider the Uinta Wind Project as a separate project from the remainder of the proposed projects. However, the Company has not conducted an independent analysis of the Uinta Project and, therefore, has not demonstrated sufficient net benefits of that project, as well.

The timing of this proceeding was premised on the critical timing associated with the need to have all Transmission Projects in service by the end of 2020, with the 500 kV projects on the critical path. Now it is the Company's testimony that the end of 2020 is not required for the 500 kV facilities. The late-filed transmission studies are still

preliminary and they do not demonstrate that the Transmission Projects can reliably integrate the proposed Wind Projects into the grid. The Commission should defer any decision on those facilities until sufficient transmission planning studies are conducted to finalize the configuration of all transmission projects and establish the ability for the projects to provide adequate transfer capability for the eastern Wyoming Wind Projects.

II. Surrebuttal Testimony

Q. What is the purpose of your Surrebuttal Testimony?

A. The purpose of my Surrebuttal Testimony is to address the Company's Rebuttal Testimony filed on January 16, 2018. My Surrebuttal Testimony focuses on those issues raised in the Company's Rebuttal Testimony pertaining to the issues discussed in my December 5, 2017 Direct Testimony. I limit my surrebuttal to issues that are not superseded by the changes introduced in the Company's Second Supplemental Direct Testimony.

Q. Please summarize the issues that you address in your Surrebuttal Testimony.

A. I am offering Surrebuttal Testimony on a number of issues raised in the Company's Rebuttal Testimony.

First, I will address the change in the Company's base case on the argument for the need for the Combined Projects that has evolved from an economic opportunity investment to a necessary addition to its resource plan.

Second, I will address RMP's change from its Direct Testimony, in which it claimed that the Transmission Projects are not needed unless the Wind Projects are developed, to a claim that the need is independent of the Wind Projects.

Third, I will address the Company's changed position regarding the appropriate allocation of project risk between the Company and its ratepayers, foundational to the change in the Company's position on resource need.

Fourth, I will discuss the Company's rebuttal to issues on the transmission studies offered in 2017. However, most of those issues are now moot due to the fundamental revisions to the transmission studies since that time.

Finally, I offer responses to a number of technical issues raised in RMP's Rebuttal Testimony, including third party transmission revenue assumptions, PTC risk if the Transmission Projects are delayed, the magnitude of benefits compared to costs, the method of extrapolating the economic analysis beyond 2037, and the omission of transmission costs.

It is my view that these issues are the most important ones requiring response at this time. I have not addressed every issue raised in RMP's Rebuttal Testimony. My silence on other issues raised is not an indication that I agree with the Company's position on those issues, rather my concerns on those issues are less critical to the fundamental issues the Commission will need to consider.

A. The Combined Projects Are Economic Opportunity Projects

Q. How does the Company describe the purpose of the proposal in its Supplemental/Rebuttal Testimony?

A. The Company's Supplemental/Rebuttal Testimony describe the Combined Projects as "…necessary to meet an identified resource need…"[1] Ms. Crane testifies that "…the projects are part of the Company's least-cost, least-risk plan for meeting resource needs."[2]

Mr. Link asserts that the time-limited opportunity nature of the Combined Projects does not indicate it is disconnected from a resource need.[3] He asserts that there are both short-term and long-term needs in the system and the Combined Projects fill needs that would otherwise be met by front office transactions (FOTs).[4]

Q. Is this description different from the purpose of the proposal, as described in the Company's Direct Testimony?

A. Yes, it is a substantially different articulation of the reason to offer the proposal. In the Company's Direct Testimony, the project is characterized as an economic opportunity to take advantage of federal PTCs and provide "…significant savings to customers…",[5] describing it as "… a unique, time limited opportunity for the Company…"[6] In that

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1 Supplemental Direct and Rebuttal Testimony of Cindy A. Crane, lines 24-25.

2 Id. at lines 167-168.

3 Supplemental Direct and Rebuttal Testimony of Rick T. Link, lines 915-916.

4 Id. at lines 806 – 810.

5 Direct Testimony of Cindy A. Crane, line 44.

6 Id. at line 206.

filing, the Company did not describe the incremental wind as fulfilling a resource need. In fact, Mr. Link specifically noted that the resource balance analysis performed for the 2017 IRP showed no need for incremental capacity until 2028 and had no mention of FOTs as a factor; this is the same resource balance analysis he now asserts shows need in the near term, as well.[7]

I discuss the Company's economic opportunity rationale in more detail in my Direct Testimony.[8]

Q. What is the significance of the change in the Company's representation of the reason for pursuing for the project?

A. My basis for evaluating the Company's proposal as presented in the Direct Testimony was based on the representation that it was a project designed to take advantage of an economic opportunity and deliver significant ratepayer benefits. Therefore, my Direct Testimony focused on whether or not there was a high likelihood that the Combined Projects would deliver significant benefits to ratepayers.

In evaluating a project that is designed to meet a generation resource capacity need or a transmission reliability need, the Company is asserting that the standard of review should be no different than any other resource decision. Mr. Link argues for the primary focus to be on the Medium Gas, Medium CO_2 price scenario (which he refers to as the "central forecast"), noting that, in his analysis, that scenario offers a "reasonably sized cushion."[9]

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7 Direct Testimony of Rick T. Link, lines 111-115.

8 Direct Testimony of Daniel Peaco, lines 131 – 151.

9 Supplemental Direct and Rebuttal Testimony of Rick T. Link, lines 1126-1139.

In shifting to the resource need approach from an economic opportunity perspective with assurances of a high likelihood of significant ratepayer benefits, the Company is seeking to have little weight placed on the scenarios that produce negative benefits.

In the case of an economic opportunity, the choice is different. The options are to pursue the project or not pursue the project. As I described in my Direct Testimony, in this circumstance, a choice to pursue such a project should be done only if there is a high likelihood of significant benefits to ratepayers.[10] As an economic opportunity project, there is no merit to proceeding with the project unless there is a high likelihood of significant benefits to ratepayers. The Company is proposing an approach that provides ratepayers much less assurance of significant benefits.

Q. Has the Company provided sufficient evidence supporting the claim of a resource need?

A. No, it has not. In the rebuttal portion of my testimony, I demonstrate that the Company has ignored alternatives that are lower cost and lower risk than the Combined Projects.

Q. What do you conclude regarding the Company's change from an economic opportunity to a resource need rationale for proposing the Combined Projects?

A. The net effect of the Company's change is to propose significantly less stringent criteria to justify proceeding with the Combined Projects. The Combined Projects are unable to meet the high likelihood of significant benefits to ratepayers if the economic opportunity perspective is applied. It was clear in the Company's initial analysis in the Direct

[10] Direct Testimony of Daniel Peaco, lines 282-297.

Testimony, and it is also clear in the analysis now presented in its corrected Second Supplemental Testimony, that the Combined Projects fail under the economic opportunity framework, even when accepting the Company's analysis at face value, which I do not. By now claiming that the projects meet a resource need, the Company is attempting to avoid addressing the fact that, under the Company's own analysis, the project would result in hundreds of millions of dollars in net cost to customers under a range of plausible future market conditions.[11]

The Company's shift to a resource need approach at this juncture in the case should be rejected. The Company's position in the Direct Testimony that the Combined Projects are economic opportunity projects is the reason the Company proposed them. The Company's changed rationale is unpersuasive. The Combined Projects should be considered economic opportunity projects and should be rejected unless there is a high likelihood of benefits to ratepayers.

B. The Transmission Projects Are Not Needed Independent of the Wind Projects

[11] See Table 3 below, providing the Company's estimates of net costs to customers under the Low Gas, Zero CO_2 ($184 million) and Low Gas, Medium CO_2 ($127 million) scenarios.

Q. Please describe the Company's position on the need for the Aeolus-to-Bridger/Anticline line (Segment D.2) of Gateway West and the Network Upgrades (together, the Transmission Projects) in its Rebuttal Testimony.

A. Ms. Crane notes that "[t]here is an independent need for the Aeolus-to-Bridger/Anticline line even if the new Wind Projects are not constructed because the line will improve system performance and reliability and directly serve customers."[12] She also states that the issue is not if, but when the Transmission Projects will be built, asserting that the Transmission Projects will be built in 2024 in any event.[13] Mr. Vail offered the same view in his Rebuttal Testimony.[14]

Q. How does that position differ from the Company's Direct Testimony?

A. In their Direct Testimony, Ms. Crane and Mr. Vail each testify that the Transmission Projects are not economic without the Wind Projects and the associated PTC benefits.[15]

Mr. Vail offered the following statement in his Direct Testimony:

> "*While the Aeolus-to Bridger/Anticline Line has long been recognized as an integral component of the Company's long-term transmission planning, its construction and that of other components of the Transmission Projects has not been economic until now."*[16]

[12] Supplemental and Direct Testimony of Cindy A. Crane, lines 145-147.

[13] Id. at lines 150-153.

[14] Supplemental Direct and Rebuttal Testimony of Rick A. Vail, lines 263-269.

[15] Direct Testimony of Cindy A. Crane, lines 202 – 205. Direct Testimony of Rick A. Vail, lines 56 – 71.

[16] Direct Testimony of Rick A. Vail, lines 58-61.

It is clear from these statements that the decision to proceed with the Transmission Projects is a matter of economics and not reliability of the existing system. It also demonstrates that even though the project has been part of the Company's long-term plan, this does not indicate a reliability need for the project, as the Company has historically and continues to still rely on an economic justification to build the project.

In its Direct Testimony, the Company did describe the Transmission Projects as necessary to relieve economic congestion,[17] but subsequent responses to data requests confirmed that there is no reliability need for the transmission project in the system absent the new Wind Projects.[18]

The new position that the Company has offered in its Rebuttal Testimony, that there is a need for the Transmission Projects independent of the Wind Projects, is a reversal of the testimony previously provided in the Company's Direct Testimony and in the responses to our investigation of this issue in discovery on that Direct Testimony.

Q. What evidence does the Company now offer to establish the need for the Transmission Projects independent of the Wind Projects?

A. The evidence provided is very limited.

Mr. Vail asserts that, even without the new Wind Projects, there is a need for the Transmission Projects because they will improve system performance and reliability and directly serve customers.[19] He offers no reliability or economic analysis of the

[17] Direct Testimony of Cindy A. Crane, lines 200-201.

[18] RMP Response to Data Request DPU 8.1. Direct Testimony of Rick A. Vail, lines 431 – 432.

[19] Supplemental Direct and Rebuttal Testimony of Rick A. Vail, lines 263-265.

Transmission Projects built in isolation. As I noted in response to the prior question, we explored this issue in discovery and confirmed that there is no system reliability problem that would require the Transmission Projects absent the addition of the new Wind Projects. He reaffirms in his Rebuttal Testimony that the Company is in compliance with all NERC and Western Electricity Coordinating Council (WECC) reliability standards.[20]

The Company offers no economic analysis that shows that the improvements in system performance provide an economic justification for the Transmission Projects. Mr. Vail offers no information to explain how the set of costly system upgrades and additions would be economically justified solely for the reliability and system performance improvements he describes. The Company's testimony that these projects have not been economic until now (with the attendant wind capacity and PTC benefits) makes clear that the Transmission Projects are not economically justified by system performance improvements alone.

Mr. Vail asserts that stiffness factors in eastern Wyoming are such that new resources cannot be connected to the system.[21] This statement does not support the need for the Transmission Projects independent of the Wind Projects. Rather, this statement makes clear the need is conditioned on the new Wind Projects being added to the system. Only with the proposal of the Wind Projects does it now find that its answer has changed.

Mr. Vail points to a recent regional study of transmission project alternatives conducted by the Northern Tier Transmission Group (NTTG), indicating that that study calls for the

[20] Id. at lines 278-279.

[21] Id. at lines 281-282.

construction of the Energy Gateway West and South projects.[22] However, Mr. Vail's testimony does not mention that the NTTG study specifically examines the need for the Gateway Projects and alternative transmission projects for a scenario that includes 1,100 MW of eastern Wyoming wind for PacifiCorp and a total of 3,200 MW of eastern Wyoming wind from all study participants.[23] This study does not provide any evidence that there is a need for the Transmission Projects independent of the Wind Projects.

Ms. Crane contradicts Mr. Vail's premise that there is a need for the Transmission Projects independent of the Wind Projects by offering the high response rate resulting from the 2017R RFP as evidence of high demand for Segment D.2.[24] The demand which Ms. Crane refers to is not ratepayer demand, but rather project developers' demand for a transmission path for projects they want to build. Further, her statement clearly connects the need for the line to new wind energy development. The RFP results only confirms the wind resource potential in eastern Wyoming that has been well known for a long time.

In sum, the question is whether investment on the scale of the Transmission Projects is necessary or wise if those system performance gains come at an expense out of proportion to the benefits. Its statement that the Transmission Projects have never been economic until now, with the Wind Projects, confirms that the Company has consistently answered this question in the negative.

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[22] Id. at lines 325-331.

[23] NTTG 2016-2017 Regional Transmission Plan, December 28, 2017, page 14. www.nttg.biz NTTG Biennial Reports.

[24] Supplemental Direct and Rebuttal Testimony of Cindy A. Crane, lines 154-158.

Q. What evidence does the Company offer to support the assertion that the Transmission Projects will be built in 2024 in any event?

A. Mr. Vail simply refers to the Company's long-term transmission plans.[25]

As the quote from Mr. Vail's Direct Testimony that I included in an earlier response demonstrates, these Transmission Projects have been in the Company's long-term transmission plans for a long time and have not been pursued because they have not become economic. There is no evidence that the Company will have an economic case for the Transmission Projects in 2024 or that there is any requirement other than economics that would compel the Company to develop the projects by that date.

Furthermore, the years between now and 2024 could hold any manner of changes that would change the nature or location of any future need, particularly given pressure on Wyoming coal plants.

Q. What do you conclude regarding the Company's assertion that there is an independent need for the Transmission Projects and that the proposal is simply an advancement of timing from a 2024 development of the projects?

A. The Company has offered no credible support for this claim in its Supplement Direct and Rebuttal Testimony and it is contradicted by the evidence we obtained in our examination of the Company's Direct Testimony.

Transmission Projects of this scale in Wyoming can only be justified in conjunction with the development of significant new eastern Wyoming wind projects, as all of the studies

[25] Supplemental Direct and Rebuttal Testimony of Rick A. Vail, lines 265-268.

that the Company has conducted or referred to have shown. If the economics do not support the Combined Projects today and the Transmission Projects are not built now, the timing of the development will be contingent on future operational and economic conditions as have been the case in the Company's plans for many years.

C. RMP Is Asking Ratepayers to Assume Responsibility for Project Risks

Q. How has the Company changed its position regarding the appropriate allocation of risk between the Company and the ratepayers?

A. The Company couples its assertion that there is a resource plan need for the Combined Projects with an objection to the high likelihood of benefits standard that I and others put forth in Direct Testimony for the projects when viewed as an economic opportunity. In my Direct Testimony, I discussed and applied a standard of a high likelihood of ratepayer benefits, a standard that Ms. Crane initially discussed in the Wind Repowering proceeding as appropriate.[26]

Ms. Crane now objects to the higher standard of approval for the Combined Projects based on her assertion that these projects are not economic opportunity projects, but are needed to meet customer need.[27] Furthermore, she asserts that there is a low risk of the projects being uneconomic by pointing to Mr. Link's benefits analysis for the 2020-2036 period showing all nine price-policy scenarios with positive benefits,[28] ignoring the

[26] Direct Testimony of Daniel Peaco, lines 283-301.

[27] Supplemental Direct and Rebuttal Testimony of Cindy A. Crane, lines 164-168.

[28] Id. at lines 176-179.

life-of-project results that show two of the nine scenarios with negative benefits and limited benefits in others. Ms. Crane also states that it not appropriate for the Company to take risks beyond its control.[29]

Mr. Link asserts that there is "nothing novel or unique" about the Combined Projects that would require heightened review or a different standard for approval. He asserts that the Projects do not present risks different than typical utility investments.[30] In addition, he asserts that the Combined Projects are least-cost, least-risk compared to all other alternatives.[31]

Ms. Crane's and Mr. Link's statements make clear that the Company is coupling its assertion that there is a critical need for the projects with its position that the standard of review not be any different than for any other resource need-based decision. In this construct, the Company expects the ratepayers to assume risks that the Company cannot control.

In my view, the Company is asserting that the standard of review should consider whether the Combined Projects are more likely than not to provide benefits to ratepayers, rather than a high likelihood of customer benefits that I discussed in my Direct Testimony.

[29] Id. at lines 207-208.

[30] Supplemental Direct and Rebuttal Testimony of Rick T. Link, lines 1080-1086.

[31] Id. at lines 1004-1008.

Q. Did the Company offer any other response to the standard of review that you proposed?

A. Yes. Mr. Link did offer rebuttal to my discussion of the Low Gas, Zero CO_2 scenario in my direct testimony. His rebuttal testimony incorrectly asserts that I described this as the most likely scenario[32] and then proceeds to rebut that assertion rather than my testimony as offered.

In my Direct Testimony, I did argue that the Low Gas, Zero CO_2 scenario is the one that most closely resembles current market expectations in this case and that the Company should demonstrate benefits to customers under this scenario. In that case, and one other, Mr. Link's own analysis (life-of-project) shows the benefits to ratepayers to be negative.

To be clear, the reason for my focus on this case is to help establish an analytical basis for the "high likelihood of benefits to customers" standard. In the context of this case, which I continue to view as an economic opportunity, a 50/50 proposition or "more likely than not" standard is unacceptable. A serious examination of the adverse outcomes is necessary to provide assurance of a much higher probability of benefits to customers. The Combined Projects should be sufficiently robust to be beneficial across the full possible range of market and policy outcomes.

[32] Id. at lines 1353-1362.

Q. Are there other examples of the Company's position on allocation of risk to customers?

A. Yes. The Company's response to my comments on energy production risk are another example of the Company asking the ratepayers to assume significant risk.

Mr. Link takes issue with my discussion of production risk associated with the Wind Projects. He asserts that I am offering a one-sided risk assessment that ignores the potential upside if production is higher than the Company's forecast.[33] Mr. Teply responds to the concerns I expressed about the production estimates, describes new third-party technical assessments that provide production assessments on a 50-percent probability (P50) basis and objects to having the Company taking the risk that the actual production might be lower than the P50 level.[34] In addition to the inherent uncertainty in the wind resource, Mr. Vail also acknowledges that the wind production could be curtailed at times for system protection reasons,[35] adding to the risks that the ratepayers would bear regarding the energy and PTC benefits of the Combined Projects.

The comments make clear that the Company is unwilling to be accountable for its production estimates, and more importantly, is unwilling to share the burden of the production risk with ratepayers in any way. While I did not propose the risk mitigation mechanism Mr. Teply discusses (a Company guarantee of P50 or higher), it does appear clear that the Company is asking the ratepayers to bare the risk on energy and PTC

[33] Id. at lines 1363-1373.

[34] Supplemental Direct and Rebuttal Testimony of Chad A. Teply, lines 575-587.

[35] Supplemental Direct and Rebuttal Testimony of Rick A. Vail, lines 697-709.

benefits resulting from production at levels below the Company's estimates. Mr. Link's analysis assumes the P50 production to derive his benefits and, as I noted in my Direct Testimony, a small reduction from P50 production can significantly reduce the benefits to ratepayers resulting from his analysis.[36]

Q. What do you conclude regarding the Company's position on risk allocation?

A. There are a number of risks that are beyond the Company's control and the Company is making clear that it does not wish to assume those risks. Two examples of those risks are the future natural gas and CO_2 prices and the actual level of wind energy production. In each example, the Company would like to Commission to focus on the "central forecast" to decide to move forward with the Combined Projects and have ratepayers accept any downside risk relative to those values. The Company's assertions that these projects are not "economic opportunity" projects, and that there is an independent need for the Transmission Projects, contribute to the Company's view that the it is acceptable and appropriate for ratepayers to bare material risks in this case.

However, focusing on a specific standard of review can lead one to miss the larger point about risk. If the Combined Projects are not built, despite the Company's assertion to the contrary,[37] ratepayers will be reliably served at a reasonable cost in the future. Thus, there is little downside risk for customers in the Combined Projects' absence. Rather, the Company contends that the future will be more expensive without the Combined Projects

[36] Direct Testimony of Daniel Peaco, lines 984-993.

[37] Mr. Link asserts that the alternatives to the Combined Projects are as risky. Supplemental Direct and Rebuttal Testimony of Rick T. Link, lines 1085 - 1086.

than it would be with them. While there are scenarios in which the Company could be correct, the point is there are plausible scenarios in which the Company is wrong. Because the future without these projects appears reasonable and the projects are expensive, the Company is asking ratepayers to assume the risks of large costs without corresponding benefits. This is the heart of this matter and it is distinct from a situation where the Company must add new resources and the resource deficiency must be corrected using the best available information. `

I continue to recommend that the Commission view the Combined Projects as an economic opportunity and apply a high likelihood of benefits standard on any decision to approve the projects. In that context, the Company's view of the benefits should be understood to represent a lower standard of review, subjecting ratepayers to greater unnecessary risks.

D. New Transmission Studies Pose Issues Different Than Those Previously Addressed

Q. Please describe the issues raised in the Company's rebuttal testimony regarding the transmission planning studies.

A. Mr. Vail responded to three issues that I raised in my Direct Testimony related to the preliminary Aeolus West Transmission Path Transfer Capability Assessment provided in October 2017.[38]

Two issues were specific to assumptions in that study, which has now been superseded by entirely new and different studies that were provided in February 2018,[39] and most recently March 30, 2018.[40] Those issues pertain to the limits on the TOT 4B path and the ratings on the Platte-Standpipe 230-kV segment. I do not respond further on those issues, subject to my review of the new, late-filed studies.

The third issue pertains to the issue of the prudency of the use of Remedial Action Schemes (RAS) in the plan.

Q. Do you have any concerns with the Company's response to the use of RAS in the plan?

A. Yes. My Direct Testimony pointed to a Company document that stated "*Reliance on excessive generator tripping/curtailment or operator intervention is not viewed as*

[38] Attachment RMP's Response to Data Request OCS 8.1, *Aeolus West Transmission Path Transfer Capability Assessment* (October 2017).

[39] Attachment RMP's Response to Data Request DPU 21.1, *Aeolus West Transmission Path Transfer Capability Assessment* (February 2018).

[40] Attachment RMP's First Supplemental Response to Data Request DPU 21.1, *Aeolus West Transmission Path Transfer Capability Assessment* (March 30, 2018).

prudent transmission planning for the BES"[41] and observed that the Company had not explained how the extensive use of RAS in this case comported with that statement. Mr. Vail's response to that concern was to offer a statement asserting that RAS, in general, are consistent with NERC standards and are not imprudent or unreasonable.[42] His statement conflicts with the citation I referenced. He offered no explanation of the citation and did not offer any answer on the criteria that distinguishes between RAS that are prudent and reasonable and those that are not. As a result, we have no basis to know how the RAS now proposed pass those criteria.

E. RMP's Third-Party Transmission Revenue Assumptions Remain Unsupported

Q. Please describe the issues raised in the Company's rebuttal testimony regarding third-party transmission revenue.

A. In my Direct Testimony, I expressed the concern that the Company included a significant amount of third-party transmission revenue and had provided no support for that value. Utah Association of Energy Users' witness Mr. Mullins raised this issue, as well.[43]

Mr. Vail responds to this concern by describing the third-party revenue in the current tariff and indicating that it changes from year to year.[44] This response provides no forward-looking information or any basis for the implicit conclusion that the 12 percent

[41] Direct Testimony of Daniel Peaco, lines 553-555.

[42] Supplemental Direct and Rebuttal Testimony of Rick A. Vail, lines 448-457.

[43] Id. at line 763.

[44] Id. at lines 767-770.

of Transmission Project costs that will be paid for by parties other than ratepayers will remain constant over the next 35 years.

Q. What do you conclude from Mr. Vail's response?

A. The Company's assumption regarding this revenue stream from third parties is supported only by the current tariff values. Given the share of the net benefits that this value represents, I find this does not provide a reasonable assumption for the life of the project.

F. PTC Risks Due to Transmission Projects' Delay Remains Unaddressed

Q. Please describe how the Company addressed the risk of PTC qualification if the Transmission Projects are not in service by December 31, 2020.

A. Mr. Vail provides a brief response to this issue.[45] He indicates that some unspecified subset of the Transmission Projects, if completed by that date, could facilitate synchronization of the Wind Projects to the grid and enable commissioning of the turbines as required by the IRS for qualification.

Q. What do you conclude from Mr. Vail's response?

A. The risk of PTC qualification remains unaddressed.

Mr. Vail does not identify the specific projects or elements that are required by December 31, 2020 to meet the IRS PTC qualification requirement. The scheduling of those facilities remains critical to reaching this key milestone.

[45] Id. at lines 689-696.

In addition, Mr. Vail does not address the curtailment of Wind Project output that would be required in the event the subset of projects is successfully completed but not all elements of the Transmission Projects are in service by December 31, 2020. Even if the turbines are qualified for 100 percent PTCs, they are of lower value to ratepayers if the production is curtailed due to delays in the Transmission Projects.

G. Gross Benefits Are Not Material, the Net Benefits Relative to Total Costs Are Small

Q. Please describe the Company's testimony regarding the magnitude of benefits relative to costs.

A. Mr. Link takes issue with my observation that the scale of the net benefits in many of the Company's cases are very modest relative to the size of the initial investment.[46] He argues that it is improper to compare net benefits to project costs, rather gross benefits should be the comparison. Further, he asserts that the fact that net benefits are small has little meaning in this case.

Q. What is your assessment of Mr. Link's position on this issue?

A. I disagree with his view. His argument here clearly stems from his view that this is a resource need case, rather than an economic opportunity case, an issue I have discussed elsewhere in my Surrebuttal Testimony. In the context of the economic opportunity that the Company offered in its Direct Testimony, the ratepayers are fully entitled to expect a reasonable return to warrant supporting an economic opportunity investment of this scale.

[46] Supplemental Direct and Rebuttal Testimony of Rick T. Link, lines 1313-1332.

Mr. Link's testimony is inconsistent with the proposition offered by Ms. Crane, namely benefits to ratepayers that significantly outweigh the costs.[47] Even if you accept Mr. Link's resource need argument, the scale of net benefits matters, as the scale of the investments and the unique risks to the benefits warrant solid assurances of benefits to ratepayers.

Q. Do you still believe that the benefits of the Combined Projects are small compared to the project costs?

A. Yes, I do. Using the Company's most recent estimates of project costs and benefits, I have calculated the benefit-cost ratio of the Combined Projects across the nine price-policy scenarios using the 30-year analysis. The results are presented in Table 1 below. For the purposes of this analysis, I have considered PTC revenue as a benefit, rather than a reduction to project costs as the Company has done it its analysis, and compared the present value of the benefits to the costs.

Table 1. Net (benefit)/cost and benefit/cost ratio, 30-year analysis[48]

Price-Policy Scenario	Net (Benefit)/Cost ($ millions)	Benefit/Cost Ratio
Low Gas, Zero CO_2	184	[redacted]
Low Gas, Medium CO_2	127	[redacted]
Low Gas, High CO_2	(147)	[redacted]
Medium Gas, Zero CO_2	(92)	[redacted]
Medium Gas, Medium CO_2	(167)	[redacted]
Medium Gas, High CO_2	(304)	[redacted]
High Gas, Zero CO_2	(448)	[redacted]

[47] Direct Testimony of Cindy A. Crane, lines 234-235.

[48] Source: Link Second Supplemental Direct Workpapers (corrected). *EV2020 Second Supp Results Summary File - VOM adjusted CONF.xlsx*.

High Gas, Medium CO_2	(499)	[redacted]
High Gas, High CO_2	(635)	[redacted]

These results demonstrate that the Company's own analysis shows that the Combined Projects have limited benefits relative to project costs, with two scenarios returning benefits less than costs and five of nine scenarios returning a benefit-cost ratio of [redacted], including the two scenarios showing net costs to ratepayers. I presented a similar calculation of benefit-cost ratios in the Company's wind repowering proceeding.[49] Each of the repowering projects show better benefit-cost ratios than the Combined Projects.[50]

Further, the benefit cost ratios in Table 1 are based on the Company's estimate of net benefits. Those values are overstated as they include some benefits that I believe are speculative or overstated, which I will discuss later in my testimony, making the actual values even worse.

H. RMP Has Not Addressed Problems with the Extrapolation Method

[49] April 2, 2018 Response Testimony of Daniel Peaco, RMP's Wind Repowering docket (17-035-39). See Tables 4 and 5 in that testimony.

[50] Id. at line 314 (Table 2).

Q. Please describe the Company's response to your concerns regarding the extrapolation methodology.

A. Mr. Link dismisses my critique of the extrapolation methodology asserting that I did not provide sufficient evidence of the problems.[51]

Q. What is your response to Mr. Link's position on this issue?

A. Mr. Link fails to address the totality of my testimony on this matter.

I noted that his methodology assumes that the results from the System Optimizer (SO) and Planning and Risk (PaR) models from an eight-year period are representative of the subsequent 14 years of the project life. He ignores my recommendation that he provide justification of this methodology.

I also note that this same issue was raised in the Wind Repowering Docket No. 17-035-39. In that proceeding, I provided specific examples of the anomalous results attributable to this issue.[52] Mr. Link did not directly address the issues raise regarding the issues with this methodology in that proceeding and continues to object to providing evidence that support his assertions that the methodology is sound and producing reasonable results.

Mr. Link uses complex models to evaluate only the first half of the life of the projects and uses an unsupported extrapolation for the second half and ignores concerns raised by myself and others in this proceeding and in Docket No. 17-035-39. I find his unsupported

[51] Supplemental Direct and Rebuttal Testimony of Rick T. Link, lines 1408-1416.

[52] Direct Testimony of Daniel Peaco, Docket 17-035-39, lines 362-512.

assertion that the methodology is reasonable unconvincing. It is the Company's burden to provide evidence that the analysis presented is reasonable, a burden it has not met in this case.

I. RMP Has Not Incorporated the Full Cost of the Transmission Projects

Q. Please describe the Company's Rebuttal Testimony on the full cost of the Transmission Projects?

A. Mr. Link discusses a critique Mr. Mullins and I offered regarding the omission of a portion of the Transmission Project costs due to the use of only the first 30 years of the 62 years of revenue requirements in his analysis. He asserts that I conceded that there are benefits beyond the study period.[53]

Q. What is your response to Mr. Link's position on this issue?

A. First, I note that he does not dispute the fact that the subject transmission costs are omitted from his analysis. These excluded costs are [redacted],[54] which is significant in comparison to the magnitude of the net benefits the Company has estimated. My critique of that issue remains.

Further, Mr. Link misrepresents my testimony, indicating I conceded benefits beyond the study period. In fact, my testimony responds to Mr. Link's unsupported assertion that there are benefits beyond the study period to offset those costs by indicating the costs are

[53] Supplemental Direct and Rebuttal Testimony of Rick T. Link, lines 1447-1451.

[54] Source: Link Workpapers *Gateway_IRP Data 21% US Tax (VL).xlsx*.

certain and any benefits are uncertain. At this point, he has offered no evidence that there are benefits of any amount, much less benefits sufficient to support the [redacted] of omitted costs.

I continue to recommend that the full cost of the Transmission Projects be included in the economic analysis.

III. Rebuttal Testimony

Q. What is the purpose of your Rebuttal Testimony?

A. The purpose of my Rebuttal Testimony is to address new and updated information contained in the Company's Supplemental Direct Testimony filed on January 16, 2018, Second Supplemental Direct Testimony filed on February 16, 2018, and corrections to the Second Supplemental Direct Testimony filed on February 23, 2018. The new and updated information relates to the new set of Wind Projects now being proposed for approval in this proceeding, the revised Transmission Projects now proposed to interconnect and deliver the output from those Wind Projects, and the updated and revised economic analysis presented to support the Company's assertion that the Combined Projects are economically justified. My Rebuttal Testimony focuses on (a) whether the Combined Projects are likely to be lowest reasonable cost resources, (b) the short-term and long-term impacts on Utah ratepayers, and (c) the resulting economic risks to Utah ratepayers.

The Company's Second Supplemental Direct Testimony includes the final Wind Projects offered by the Company for consideration in this proceeding resulting from the 2017R

RFP process. In addition, the Company's Supplemental Direct and Second Supplemental Direct Testimonies includes a broad set of additional changes in methodology and assumptions from its Direct Testimony, beyond those contemplated in the initial procedural order and beyond the scope of my Direct Testimony.

A. RMP's Combined Projects are Fundamentally Different than Initially Proposed

Q. Please describe the changes in the proposed Wind Projects relative to the Company's initial filing in this proceeding.

A. The components of the Wind Projects proposed by the Company have changed twice since the Company's initial filing, first in the January 16, 2018 Supplemental Direct filing, and again in the February 26, 2018 Second Supplemental Direct filing. I have summarized the changes in projects proposed in the various rounds of testimony in Table 2. With each change, the total amount of wind projects has materially increased and the locations of the wind projects has changed.

Table 2. Wind Projects proposed, by testimony round

Project Name	Included Capacity (MW)		
	Direct	Supplemental	2nd Supplemental
Ekola Flats	250	-	250
TB Flats I	250	250	250
TB Flats II	250	250	250
McFadden Ridge II	110	109	-
Cedar Springs	-	400	400
Uinta	-	161	161
Total	860	1,170	1,311

Q. Please describe the changes in the proposed Transmission Projects relative to the Company's initial filing in this proceeding.

A. The individual elements of the Transmission Projects fall into two categories.

The first is the elements of the Aeolus-to-Bridger/Anticline 500 kV line. The Company has testimony indicating there has been no changes to these elements and no change in the Company's estimate of the costs,[55] but based on my review of transmission studies provided in discovery after that testimony was submitted, it appears changes have subsequently been made to this element. I discuss these changes in more detail in Section III.G below.

The second category is the network upgrades needed to interconnect the Wind Projects. The Company has indicated that these elements have changed due to the change in portfolio of Wind Projects selected by the Company[56] and resulting from new interconnection studies.[57] The Company indicates that these changes increase the cost of the network upgrades by [redacted].[58]

Q. Please describe the key changes in assumptions, modeling methods, and benefits calculations in the Company's Supplemental Direct Testimony.

A. The Combined Projects in the Company's Supplemental Direct and Second Supplemental Direct changed significantly from those included in the June 2017 Application. The Wind

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55 Supplemental Direct and Rebuttal Testimony of Rick A. Vail, lines 48-51.

56 Id. at lines 52-81.

57 Second Supplemental Direct of Rick A. Vail, lines 29-31

58 Supplemental Direct and Rebuttal Testimony of Rick A. Vail lines 84-92; Second Supplemental Direct of Rick A. Vail, line 106.

Projects now include one project, the Uinta Project, that is in southwest Wyoming and, as a result, does not require the Transmission Projects for delivery of its output.[59] The most current proposed set of Wind Projects in eastern Wyoming, projects dependent on the development of the Transmission Projects, include more total installed capacity (1,150 MW vs. 860 MW) and a new 161 MW project in a location different from any of the locations studied in the transmission planning studies provided previously or in the Supplemental Direct. As I have described above, the Company indicated that the change in the Wind Projects requires additional transmission upgrades on the 230 kV system, while asserting (without supporting studies) that the 500 kV Transmission Projects originally proposed were adequate to reliably deliver the new Wind Projects configuration.

The Company's Second Supplemental Direct economic analysis includes a number of material updated assumptions, including the change in the reduction in the corporate tax rate enacted in federal law in December 2017, a new load forecast, and updated forecasts of natural gas, carbon, and market prices.

The Company's Second Supplemental Direct economic benefits methodology included changes from the method presented in the Direct Testimony. The Company has changed the representation of the production tax credit benefits in the SO model and added a terminal value analysis.

[59] Supplemental Direct and Rebuttal Testimony of Chad A. Teply, lines 120-123.

Lastly, the Company's Supplemental and Second Supplemental Direct Testimony included, for the first time, an assertion that the Combined Projects address a resource need and that the Transmission Projects would be built by 2024 regardless whether the Wind Projects are developed or not. As I discuss in my Surrebuttal Testimony, this is a material change from the Company's Direct Testimony that the Combined Projects represent a limited-time economic opportunity presented by the current federal PTC policy. Along with the change in the language regarding the need for the Combined Projects, the Company shifted its position on the economic benefits, no longer providing "a high degree of certainty of customer benefits," rather asserting that the Commission should now consider this on the same basis as any other resource decision based on need.

Q. Please summarize the extent of changes in the Combined Projects introduced in the Company's Supplemental and Second Supplemental Direct testimony.

A. The Combined Projects now proposed are materially different than the configuration offered in the Direct testimony, particularly with respect to the size and location of the Wind Projects. Due to these changes, the prior studies provide little value in assessing the feasibility of the Transmission Projects for this current plan. The changes in the Wind Projects and the material changes in both methodology and assumptions in the economic analysis make the Company's assessment in its Direct Testimony of no value, as well.

As a result of these changes, my testimony includes a complete revision of the assessments provided in my December 5, 2017 Direct Testimony.

B. RMP's Economic Analysis Shows that Economic Benefits Have Declined

Q. Does the Company's Second Supplemental Testimony provide updated estimates of net costs and benefits?

A. Yes. The Company has updated its analysis, providing new estimates of net costs/benefits of the Combined Projects. The Company has provided new forecasts for the three 20-year analyses (SO, PaR Stochastic Mean, and Risk-Adjusted PaR), as well as the 30-year analysis of long-term benefits through 2050.[60]

Subsequent to the filing of the Second Supplemental Testimony, on February 23, 2018 the Company issued corrected testimony and workpapers. These corrections fixed a calculation error that was present in both the Supplemental and Second Supplemental filing. This corrected testimony provided a full set of updated estimates of economic costs and benefits, and represents the most current estimates of net costs/benefits to customers. The correction reduced the benefit estimated included in the prior filings.

Q. How do the estimates of benefits compare between the Direct Testimony and the most recent estimates?

A. As I have previously discussed, the Company has made several changes to the proposal, including components of the Combined Projects, key modeling assumptions, and benefits categories. These modifications have resulted in new estimates of benefits, summarized in the tables below.

[60] The 20-year analysis extends from 2017-2036, but includes less than 17 years of project life because the projects are expected in service in 2020. The long-term analysis extends from 2017-2050, a period of 34 years. In this testimony I will refer to this as the "30-year" analysis.

Table 3. Updated net (benefit)/cost results, 30-year analysis ($ millions)[61]

Price-Policy Scenario	Annual Revenue Requirement PVRR(d)		
	Direct	Corrected Second Supp.	Delta
Low Gas, Zero CO_2	174	184	9
Low Gas, Medium CO_2	93	127	34
Low Gas, High CO_2	(194)	(147)	47
Medium Gas, Zero CO_2	(53)	(92)	(40)
Medium Gas, Medium CO_2	(137)	(167)	(30)
Medium Gas, High CO_2	(317)	(304)	13
High Gas, Zero CO_2	(341)	(448)	(107)
High Gas, Medium CO_2	(351)	(499)	(148)
High Gas, High CO_2	(595)	(635)	(40)

Table 4. Updated net (benefit)/cost results, 20-year analyses ($ millions)

Price-Policy Scenario	SO Model PVRR(d)		PaR Stochastic Mean PVRR(d)		PaR Risk-Adjusted PVRR(d)	
	Direct	Corrected Second Supp.	Direct	Corrected Second Supp.	Direct	Corrected Second Supp.
Low Gas, Zero CO_2	121	(185)	77	(150)	74	(156)
Low Gas, Medium CO_2	73	(208)	32	(179)	26	(188)
Low Gas, High CO_2	(84)	(370)	(133)	(337)	(147)	(355)
Medium Gas, Zero CO_2	(19)	(377)	(57)	(319)	(66)	(334)
Medium Gas, Medium CO_2	(85)	(405)	(111)	(357)	(124)	(386)
Medium Gas, High CO_2	(156)	(489)	(224)	(448)	(242)	(469)
High Gas, Zero CO_2	(304)	(699)	(260)	(568)	(280)	(596)
High Gas, Medium CO_2	(318)	(716)	(272)	(603)	(293)	(633)
High Gas, High CO_2	(396)	(781)	(409)	(694)	(437)	(728)

[61] Note that in the in the "Delta" column, positive numbers indicate an increase in net costs or decrease in net benefits to customers; negative numbers indicate an increase in net benefits to customers.

The Company's 30-year analysis encompassing the full project life of the Wind Projects shown in Table 3 shows that the values have declined in the three Low Gas scenarios with the results showing net costs to customers in two of those scenarios. The Company's results in the Medium and High Gas scenarios are slightly higher in five of those six scenarios.

The Company's 20-year results are shown in Table 4. The current benefits results are significantly higher across all nine scenarios than the Company's 20-year analysis included in its Direct Testimony. However, due to changes in the 20-year methodology (which I will discuss later in my testimony), these results are not comparable to the original results and are included for completeness only. It is important to note that the 20-year methodology now includes a front-loading of PTC benefits, and the apparent improvement of the economic in the 20-year analysis is not apparent in the 30-year analysis.

Q. What is your understanding of the sources of the change in the 30-year results?

A. The Delta column in Table 3 shows that estimated benefits under some scenarios have increased, while others have decreased. As I previously discussed, there are major differences in the project that was evaluated in the new analysis, including additional wind, more transmission capacity, and different project costs. In addition, since the Direct Testimony filing, the Company has updated load forecasts, fuel price forecasts, and tax rate assumptions. These factors, along with others such as the addition of the

terminal value benefit that I will discuss in this testimony, combined to impact the results differently in different price-policy scenarios.

Q. Has the Company provided an explanation for the large improvements in the 20-year results?

A. The Company's Supplemental and Second Supplemental Testimony does not directly address why the results for the two analytical periods are so different. However, based on the Supplemental Testimony of Rick Link and my review of the Company's workpapers, I believe that the factor most critical to the differences in the results is the Company's change in treatment of the PTCs. The Company is now including PTC benefits in the first ten years of Wind Project operation rather than levelized over the life of the wind turbines.

Q. What do you conclude based on your review of these benefits estimates?

A. These results indicate that since the initial filing, the Company's analysis shows that it is less able to provide a high likelihood of benefits to ratepayers. Combined Projects appear less likely to provide benefits to customers in the Low Gas scenarios and provide no meaningful improvement in the Medium and High Gas scenarios. To be clear, I base my observations on the Company's 30-year analysis, as the 20-year analysis as now presented provides an incomplete and inflated analysis of the project economics and does not provide a meaningful economic metric to use as a basis for decision-making on the overall project economics.

C. Uinta Project Should Be Considered Independent of the Transmission Projects

Q. Please summarize the wind projects included in the Combined Projects identified in the Company's Supplemental Testimony.

A. In the final shortlist, the Company selected four projects totaling 1,311 MW of incremental wind capacity:[62]

- TB Flats I and II – 500 MW
- Ekola Flats – 250 MW
- Cedar Springs – 400 MW
- Uinta – 161 MW

Q. Do all of these projects require the Transmission Projects for interconnection?

A. No, they do not. The Uinta project will interconnect in southwest Wyoming, and is not reliant on the Transmission Projects for interconnection.[63] The other three projects require the Transmission Projects.

Q. Do you agree with the Company's approach of bundling these projects as the Combined Projects in the economic evaluation?

A. No, I do not. Since the Uinta project does not rely on the Transmission Projects, it is not reasonable to bundle it with the other projects in determining the total net benefits. The Combined Projects have been proposed as a group based on the Company's

[62] Second Supplemental Direct Testimony of Chad A. Teply, lines 26-[redacted].

[63] Supplemental Direct and Rebuttal Testimony of Chad A. Teply, lines 117-125.

representation that they are mutually dependent. As noted by the Company, "[t]he transmission projects are not economic without the incremental, cost-effective Wind Projects generating zero-fuel-cost energy and PTCs."[64]

However, the Uinta project is a separate and discrete resource decision from the Transmission Projects and should be evaluated on a standalone basis. The benefits, if any, of the Uinta project do not derive from the Transmission Projects and any Uinta project benefits should not be used in the economic analysis to justify the Transmission Projects.

Q. How would removing the Uinta project from the Combined Projects impact the total benefits of the proposal?

A. The Company has only provided limited analysis evaluating the benefits of the Uinta project on a standalone basis, and has not provided analysis evaluating the benefits of the remaining Combined Projects with Uinta removed. The analysis provided is limited to one price-policy scenario (Medium Gas, Medium CO_2) and was conducted only with the 20-year SO method. This analysis found that the impact of removing the Uinta project reduced the total benefits of the Combined Projects by [redacted].[65] The Company did not provide analysis of the Uinta project for the other eight price-policy scenarios or for the full project life (30-year) analysis.[66]

[64] Direct Testimony of Cindy A. Crane, lines 200-205.

[65] RMP's Response to Data Request DPU 13.10(d).

[66] RMP's Response to Data Request DPU 15.1.

Q. Are you able to estimate the benefits of the Uinta project alone for other methods and price-policy scenarios?

Yes, I approximated the net benefits using the Company's analysis of the Combined Projects bundle. The corrected workpapers provided in support of the Link Second Supplemental Direct Testimony include the costs assigned to each of the wind projects, along with the bundled benefits of the Combined Projects as a whole. Using this data, I estimated the net benefits of the Uinta project using project-specific costs, and a pro rata share of benefits based on the percentage of total incremental wind generation contributed by the Uinta project.[67] The table below summarizes the results across all price-policy scenarios for the 30-year analysis.

Table 5. Uinta Project Annual Revenue Requirement PVRR(d) (through 2050)

Price-Policy Scenario	Combined Projects (as proposed)	Uinta Only	Combined Projects (without Uinta)
Low Gas, Zero CO_2	184	[redacted]	[redacted]
Low Gas, Medium CO_2	127	[redacted]	[redacted]
Low Gas, High CO_2	(147)	[redacted]	[redacted]
Medium Gas, Zero CO_2	(92)	[redacted]	[redacted]
Medium Gas, Medium CO_2	(167)	[redacted]	[redacted]
Medium Gas, High CO_2	(304)	[redacted]	[redacted]
High Gas, Zero CO_2	(448)	[redacted]	[redacted]
High Gas, Medium CO_2	(499)	[redacted]	[redacted]
High Gas, High CO_2	(635)	[redacted]	[redacted]

[67] My analysis assumes Uinta generation is [redacted] of total incremental wind. Based Link Second Supplemental Workpapers: *PaR Stochastic Summary P_R17-FSLW-MM _1802091508.xlsm*

These results show that in five of the nine price-policy scenarios, the Uinta project does not deliver net benefits to customers. It is important to note that this is an approximation of the net benefits because the Company has not performed the full SO and PaR modeling analysis with Uinta separated from the other projects. I recommend that the Company conduct a full benefits analysis of the Uinta project alone, and a separate analysis of the remaining elements of the Combined Projects.

Q. What do you conclude regarding the inclusion of the Uinta project in the proposed Combined Projects?

A. The Uinta project does not rely on the Transmission Project for interconnection, and should not be included in the Combined Projects which were intended to be mutually dependent wind and transmission projects.

Based on my approximate analysis, the Uinta project appears to not produce positive net benefits for ratepayers in five of the nine price-policy scenarios and does not appear to provide a high likelihood of ratepayer benefits. The Company should evaluate the Uinta project independently and seek separate approval based on the economic benefits of that project alone.

D. Company's Economic Analysis Includes Speculative Benefits

Q. Please describe the categories of benefits calculated in the Company's economic analysis of the Combined Projects.

A. The workpapers provided in support of the Company's economic benefits analysis include categorized costs and benefits. The items that offset the costs of the Combined Projects include:

- Incremental Transmission Revenues
- Terminal Value Benefit
- PTCs
- System Impacts (reductions to Net Power Costs, CO_2 Costs, Other Variable Costs, and System Fixed Costs)

Q. Do you have concerns with any of the categories?

A. Yes, I do. I am particularly concerned with the Company's inclusion of potentially speculative benefits associated with the terminal value and the incremental transmission revenue. The terminal value benefit was not included in the Company's analysis presented in its Direct Testimony but has been added to its methodology in the Supplemental and Second Supplemental Direct. The incremental transmission revenue is an issue that raised in my Direct Testimony and also discussed in my Surrebuttal Testimony above.

Q. How did the Company determine the terminal value benefit in the analysis presented in its Supplemental and Second Supplemental Direct Testimony?

A. The Company argues that after a wind project reaches the end of its useful life and is decommissioned, the remaining site still contains the roads and infrastructure needed for a wind project (unless this infrastructure was also decommissioned). Therefore, if a new project was developed on the site, it could theoretically be less expensive than developing a new "greenfield" site. The terminal value represents the Company's estimate of the capital investment that could be saved if the (non-PPA) Wind Projects are redeveloped at the end of their useful life.[68] The components of the terminal value include development rights, transmission assets, and non-transmission infrastructure such as roads.[69]

Q. What is the magnitude of the terminal value benefit?

A. The Company has assumed that the total terminal value of the sites is [redacted] in 2050. Discounted back to 2016 dollars, this represents a [redacted] PVRR benefit.[70] This value is consistent across all price-policy scenarios. In the Medium Gas, Medium

[68] Supplemental Direct and Rebuttal Testimony of Rick T. Link, lines 401-415.

[69] RMP's Response to Data Request DPU 13.20(a).

[70] Link Second Supplemental Direct Workpapers (corrected). *EV2020 Second Supp Results Summary File - VOM adjusted CONF.xlsx*.

CO_2 scenario, this benefit alone represents [redacted] of the net benefits of the Combined Projects.

Q. What are your concerns with the terminal value benefit?

A. First, this terminal value is newly introduced in the Supplemental Direct filing and retained in the Second Supplemental Direct filing. This benefit was not included in the original Direct Testimony filing and represents a change in methodology which yields additional benefit value of the projects.[71]

Second, this benefit is highly speculative. There is no reason to believe at this time that redeveloping those sites would even be permitted in 2050, and no certainty that installing a new wind project would be the most prudent resource decision at that time. If either of these conditions are not present in 2050, the terminal value benefit would be zero.

Given the high percentage of net benefits that are attributable to this terminal benefit value, the inclusion of this speculative benefit represents a considerable risk that, depending on the price-policy scenario, estimated net benefits could be reduced or net costs to customers could increase.

Q. How did the Company determine the transmission revenue value?

A. The incremental transmission revenue value represents the portion of the Transmission Projects that will be paid for by third-party transmission customers under PacifiCorp's Open Access Transmission Tariff (OATT). As I have discussed in the Surrebuttal section of my testimony, the Company has assumed in its analysis that 12 percent of the costs of

[71] RMP's Response to Data Request DPU 13.20(e).

the Transmission projects will be paid for by third-party customers, and has removed this percentage from the costs of the transmission projects. The Company used 12 percent because it is the current level of the Annual Transmission Revenue Requirement (ATRR) that is funded by OATT customers. Essentially, this adjustment assumes that there will be third party transmission customers that will support 12 percent of the Transmission Projects over their useful life.

Q. What are your concerns with this approach?

A. The Company has acknowledged that the portion of the ATRR that is funded by OATT customers fluctuates year-to-year, and that in recent years it has been as low as 10 percent and as high as 13 percent.[72]

Using the 12 percent assumptions, the total NPV of the transmission revenue is [redacted], which is [redacted] of the total net benefits in the Medium Gas, Medium CO_2 price-policy scenario.

The assumed 12 percent contribution from third party transmission customers is not supported by any commitments or analysis and, therefore, represents a risk to ratepayers. If the actual portion was only 10 percent over the entire study period, it would reduce the net benefits under each price-policy scenario by [redacted] in the 30-year analysis. Given the low amount of net benefits in several of the price policy scenarios, even a modest reduction in benefits of this size can impact whether the Combined Projects deliver net benefits or impose a net cost on customers.

[72] RMP's Response to Data Request OCS 2.1.

Q. What is the relative magnitude of these assumed benefits?

A. Together, the terminal value and transmission revenue benefits represent a significant portion of the total net benefits of most price-policy scenarios. In addition to these two values, the Company has also omitted the portion of the cost of the transmission that will be recovered after 2050, as I discussed in the Surrebuttal portion of my testimony.

Absent these assumed benefits and including the full cost of the Transmission Projects, four of the nine price-policy scenarios are negative (net cost to ratepayers) and one other has very limited positive benefits (Table 6).

Table 6. Adjusted net (benefit)/cost results, 30-year analysis ($ millions)

Price-Policy Scenario	Company's Filing	Terminal Value	Transmission Revenue	Transmission Cost 2051-2082	Revised Total Net (Benefit)/Cost
Low Gas, Zero CO_2	184	[redacted]	[redacted]	[redacted]	[redacted]
Low Gas, Medium CO_2	127	[redacted]	[redacted]	[redacted]	[redacted]
Low Gas, High CO_2	(147)	[redacted]	[redacted]	[redacted]	[redacted]
Medium Gas, Zero CO_2	(92)	[redacted]	[redacted]	[redacted]	[redacted]
Medium Gas, Medium CO_2	(167)	[redacted]	[redacted]	[redacted]	[redacted]
Medium Gas, High CO_2	(304)	[redacted]	[redacted]	[redacted]	[redacted]
High Gas, Zero CO_2	(448)	[redacted]	[redacted]	[redacted]	[redacted]
High Gas, Medium CO_2	(499)	[redacted]	[redacted]	[redacted]	[redacted]
High Gas, High CO_2	(635)	[redacted]	[redacted]	[redacted]	[redacted]

These two benefits, and the omission of certain transmission costs, have a material impact on the benefits asserted by the Company, benefits components which are speculative and highly uncertain.

E. RMP's Economic Analysis Remains Flawed

Q. Please describe your concerns with the economic modeling methodology.

A. In my prior testimony, I have raised several issues related to the methodology used by the Company to model the economic benefits of the Combined Projects. These issues remain, and there are additional issues related to changes in methodology by the Company.

Specifically, I have previously offered the following critiques:

- The study period for the 30-year analysis includes the full life of the wind projects, accounting for all costs and benefits, but only half of the 62-year cost recovery period for the transmission assets.[73] This means that the net benefits calculations include all quantified benefits, but do not include all known and quantified project costs, thus overstating benefits. The Company's analysis continues to include only the first 30 years of cost recovery of the Transmission Project, so my original concern is still valid.
- The method used by the company to determine benefits in the years after 2037 relies on an extrapolation method, rather than model the projects through the entire study period.[74]

[73] See Direct Testimony of Daniel Peaco, lines 365-379.

[74] Id. at lines 380-389.

Q. Do you have any new concerns with the Company's methodology?

A. Yes. The Company's updated analysis included a modification to its methodology in the treatment of PTCs in the 20-year analysis. The change in methodology provides a distorted assessment of potential benefits of the Combined Projects.

Q. Please explain the Company's change in treatment of the PTCs.

A. The Company had originally incorporated the benefit of the PTCs on a levelized basis in the 20-year analyses. In the Supplemental Analysis, the Company applied the PTCs on a nominal basis. According to the Company, this approach "better reflects how the federal PTC benefits for these bids will flow through to customers…"[75] The practical effect of the change is that more of the benefits are front-loaded in the early years of the project, but the wind project costs are still spread out though the 30-year life of the assets.

Q. Do you have a view as to whether or not the change in treatment is appropriate?

A. Given that the assets being proposed in the Application are long-term investments, and the fact that the costs of the project are incorporated on a levelized basis,[76] I believe it is more appropriate to use a levelized PTC benefit. The method used by the Company results in substantially higher benefits levels in the 20-year analysis than in the long-term analysis. This provides a distorted estimate of the project benefits, and makes the 20-year analysis an even worse indicator of the net impacts of the proposed long-term investment.

[75] Supplemental and Direct Testimony of Rick T. Link, lines 537-547.

[76] Id. at lines 548-558.

F. RMP's Analysis Does Not Support Its Resource Need-Based Claims

Q. Please summarize the Company's claim that the Combined Projects address a specific resource need.

A. As I previously discussed in the Surrebuttal portion of my testimony, the Company, in its Supplemental Testimony, has changed its position on the need for the Combined Projects. The Company now claims that, rather than an economic opportunity, the projects are needed to fulfill short- and long-term resource needs and that the Combined Projects are the least-cost and least-risk resources to meet the need. In my Surrebuttal Testimony above, I have explained my view that the Company has not supported this change in justification for the proposal.

Q. In addition to the objections you have raised regarding their claims of resource need, do you have any concerns with the Company's claim that the Combined Projects fulfill a resource need in a least-cost, least-risk manner?

A. Yes, I do. Even if the Company had provided sufficient support for the claimed resource need, they have not demonstrated how the selection of the Combined Projects ensure that the least-cost, least-risk resources were selected to meet the resource need.

Specifically, the Company's Application contains the following related flaws:

- The RFP was initially structured to limit the resources eligible to offer bids, preventing potentially lower cost resources from offering capacity to meet the claimed need.

- The Company's evaluation of the wind projects in the RFP did not appropriately consider the cost of the Transmission Projects.
- The Company's own analysis shows that [redacted] solar options are available to meet the claimed resource need [redacted].
- [redacted] options that could potentially yield more benefits for ratepayers were not selected in the RFP.
- The Company has not sufficiently evaluated lower cost transmission options.

Q. Please explain your concern regarding the limitations on resources sought in the RFP.

A. The structure of the Company's RFP, as initially proposed, did not support the goal of meeting a capacity resource need, as the Company now claims. As originally structured, the RFP only solicited wind resources in Wyoming, excluding potentially lower cost wind resources in other states, excluding solar resources, and excluding other technologies, such as natural-gas generators, that could provide lower-cost resource capacity.

Upon request from the Independent Evaluator (IE), the Company ultimately broadened the RFP to allow wind resources outside of Wyoming,[77] and issued a second RFP for solar resources based on the Commission's suggested modification to the Wind RFP.[78]

[77] Docket 17-035-23, Commission Order Approving RFP with Suggested Modification (September 22, 2017), p. 7.

[78] See Id. at pp. 8-9, 12.

The structure of the RFP, as originally proposed by the Company, was clearly intended to solicit only Wyoming wind projects that would support the construction of the Transmission Projects, and not intended to identify the least cost resources to meet the claimed resource need. If it was the Company's intent to meet a need for capacity in its system at least cost, an RFP narrowly targeted to only wind resources in a specific location or even the somewhat broader solicitation of wind projects included in the final RFP is not consistent with seeking resources to meet a capacity need in its system at-large at least cost. An all-source RFP would have been much more consistent with the need-based argument Mr. Link has advanced in his testimony. To be clear, the resource need that Mr. Link asserts is for capacity in the system to meet reserve margins, not a need specific to eastern Wyoming.[79]

Q. Do you have any additional concerns regarding the structure of the RFP analysis?

A. Yes, I do. The Company's evaluation of the wind bids in the RFP did not appropriately consider the cost of Segment D.2. This line is needed to interconnect the wind projects in eastern Wyoming, and as I have previously discussed, is not needed otherwise. However, in evaluating the costs and benefits of the bids, the Company did not assign any portion of the costs of this line to the wind projects driving the need for its construction.[80] This approach understates the costs of the RFP projects in eastern Wyoming, and does not create an evaluation structure in which the lowest cost resources are identified.

[79] Supplemental Direct and Rebuttal Testimony of Rick T. Link, lines 885-897.

[80] RMP's Response to Data Request DPU 13.10(c).

By ignoring the cost of the transmission line needed to interconnect the wind projects in eastern Wyoming, the evaluation of the bids was not structured to identify the least cost resources to meet the claimed resource need.

Q. What information did the Company provide on the results of the solar RFP?

A. The solar RFP is ongoing, and bidders have submitted best-and-final pricing.[81] The Company evaluated a portfolio of bids from the solar RFP using the updated pricing and presented the results of this evaluation in Mr. Link's Second Supplemental Direct Testimony.[82] Mr. Link concludes that, compared to the Combined Projects, the portfolios consisting only of solar resources produce fewer benefits to customers than the Combined Projects.[83]

Q. Do you agree with Mr. Link's conclusions?

A. No, I do not. First, Mr. Link's conclusions are based only on a review of the 20-year analyses. Based on the corrected workpapers provided on February 23, 2018, the 30-year analysis shows that over the long-term, the portfolios of solar resources [redacted]. Table 7 below compares the 30-year results for the Low Gas, Zero CO_2 and Medium Gas, Medium CO_2 scenarios (the Company did not conduct the sensitivity for other scenarios).

[81] Second Supplemental Direct Testimony of Rick T. Link, lines 405-408.

[82] Id. at lines 404-448.

[83] Id. at lines 439-446.

Table 7. Solar sensitivity results, 30-year analysis[84]

Price-Policy Scenario	Annual Revenue Requirement PVRR(d)		
	Combined Projects	Solar Sensitivity	Delta
Low Gas, Zero CO_2	184	[redacted]	[redacted]
Medium Gas, Medium CO_2	(167)	[redacted]	[redacted]

In addition, Mr. Link's limited presentation of results only considers net benefits of the alternatives. The solar resource portfolios are [redacted] than the Combined projects. The NPV of the capital recovery for the solar portfolio in the Medium Gas, Medium CO_2 scenario is approximately [redacted] and only [redacted] for the portfolio in the Low Gas, Zero CO_2 scenario, while the same metric for the Combined Projects is [redacted], including the net effect of the PTCs.

Therefore, even if the solar portfolios yield lower total benefits in most of the 20-year analyses [redacted].

[84] Source: *EV2020 Second Supp Results Summary File - VOM adjusted CONF.xlsx.*

Q. Please describe your concern with the [redacted] options that could yield more benefits.

A. Mr. Link describes a sensitivity analysis requested by the Utah and Oregon IEs, in which the Company evaluated a scenario where [redacted].[85]

Mr. Link concludes that this scenario does not yield preferable results.[86] However, once again, Mr. Link is only selectively reporting modeling results. Based on the corrected workpapers provided on February 23, 2018, the 30-year analysis shows that over the long-term, the IE sensitivity yields results [redacted] in net benefits in the Medium Gas, Medium CO_2 scenario, versus $167 million for the Combined Projects as proposed. [redacted]

Q. Has the Company conducted sufficient evaluation of transmission alternatives to demonstrate that this is the least-cost, least-risk solution to a resource need?

A. No, they have not. Of particular note is the fact that the Company has not provided any evidence that it has sufficiently evaluated alternatives to the Transmission Projects, such as 345 kV or 230 kV transmission upgrades.

The Company has explicitly stated that it did not evaluate a 345 kV solution, noting that "[a]s the D.2 Project (Bridger/Anticline – Aeolus) is a sub-segment of the Energy

[85] Second Supplemental Direct Testimony of Rick T. Link, lines 218-234.

[86] Id. at lines 226-229.

Gateway masterplan, which calls for 500 kV transmission to be constructed west and south of Aeolus substation, no 345 kV alternatives were considered."[87]

The Company did perform a separate analysis on whether it could retire the Dave Johnston coal plant early and integrate 1,169 MW of incremental wind generation using only new 230 kV transmission facilities and upgrades.[88] The study concluded that 230 kV upgrades could be used to reliably integrate the incremental wind, but the Company has not evaluated the economic benefits of such a solution.

Q. Has the Company conducted sufficient evaluation of alternatives to a wind and transmission solution in eastern Wyoming to demonstrate that this is the least-cost, least-risk solution to a resource need?

A. No, they have not. I have described several alternatives that the Company should be pursuing if the Company was truly seeking a least-cost, least-risk solution to a defined resource need. However, as I also discussed, the Company has not justified its new claim that the proposed Combined Projects are intended to address a defined resource need.

[87] RMP's Response to Data Request DPU 10.20.

[88] Attachment to RMP's Response to Data Request DPU 11.18.

G. RMP Has Not Demonstrated That the Transmission Projects Can Reliably Integrate the Wind Projects into The System

Q. What transmission studies has the Company provided to demonstrate the ability of the Transmission Project to integrate the Wind Projects?

A. The Company submitted copies of the most recent System Impact Studies[89] (SIS) in the Second Supplemental Testimony and the Aeolus West Transmission Path Transfer Capability Assessment[90] ("Transfer Capability Assessment") in responses to data requests subsequent to the submission of the Supplemental Direct and Second Supplemental Direct testimonies. The SIS for each of the Wind Projects (except Ekola Flats) were completed in February 2018 as part of a restudy process described in the Company's Second Supplemental Direct Testimony. The Transfer Capability Assessment was provided on March 30, 2018 and is a revision of a preliminary transfer capability study provided in October 2017 ("October 2017 Study").[91]

Q. Are there any major differences in the Transfer Capability Assessment from the October 2017 Study you reviewed and discussed in your Direct Testimony?

A. Yes. There are several significant changes in the Transfer Capability Assessment in comparison to the October 2017 Study. Some of the major changes consist of:

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89 Second Supplemental Direct Testimony of Rick A. Vail, Exhibit RMP___(RAV-2SS), Exhibit RMP___(RAV-3SS), Exhibit RMP___(RAV-4SS) and Exhibit RMP___(RAV-5SS).

90 Attachment to RMP's First Supplemental Response to Data Request DPU 21.1, *Aeolus West Transmission Path Transfer Capability Assessment* (March 30, 2018).

91 Attachment RMP's Response to Data Request OCS 8.1, *Aeolus West Transmission Path Transfer Capability Assessment* (October 2017).

- A new configuration of the Wind Projects;
- Changes to study assumptions with respect to composition of Segment D.2 Project; and
- Changes to existing generation composition and dispatch.

Q. Do the above studies demonstrate that the Transmission Project is sufficient to integrate the shortlisted Wind Projects?

A. No. The new studies do not demonstrate that the Transmission Projects, consisting of the D.2 Project along with network upgrades to support new wind generation resources, is sufficient to reliably integrate the shortlisted Wind Projects.

Q. Please explain why the currently proposed Transmission Project is insufficient to integrate the shortlisted Wind Projects?

A. The new studies do not provide all required information necessary to demonstrate that the Company can successfully integrate the shortlisted Wind Projects.

The Transfer Capability Assessment includes a power flow analysis and a dynamic stability analysis. The power flow analysis assesses the maximum transfer capability of a transmission path and identifies the corrective measures necessary to achieve this transfer capability. The dynamic stability analysis evaluates the response of the system to critical disturbances.

The Transfer Capability Assessment refers to the power flow analysis as "preliminary,"[92] indicating that additional studies are to be performed to finalize the transfer capability of the Aeolus West path with the addition of the Transmission Project.

In addition, the Transfer Capability Assessment also found that for some critical system disturbances in eastern Wyoming, the study showed "poor" voltage performance and "unacceptable" oscillations. The Company has stated that the drivers for these concerns are the wind turbine models used for some of the shortlisted Wind Projects.[93] The Company has stated that it is communicating with the wind turbine manufacturer to attempt to resolve the issue, but at this time there is no completed analysis that demonstrates acceptable system performance for the outages tested.

If the Company's discussions with the manufacturer results in changes to the wind turbine models, this could modify the transfer capability of the Aeolus West path and increases the possibility that revisions to the SIS for each of these shortlisted Wind Projects will be necessary, as well (specifically Ekola Flats I Q0706, TB Flats I Q0707 and TB Flats II Q0708). The restudy process could potentially lead to additional network upgrades beyond those currently included in the Transmission Projects. Due to the poor results to date and the uncertainties remaining, the currently proposed Transmission Projects and the studies performed by the Company are incomplete and do not

[92] Attachment to RMP's First Supplemental Response to Data Request DPU 21.1, Aeolus West Transmission Path Transfer Capability Assessment (March 30, 2018), p. 3.

[93] The "wind turbine models" referenced in this section refer to the representation of the wind generating units in the dynamic stability analysis. Each wind turbine model has unique manufacturer-specific turbine, governor and generator characteristics and its dynamic response to system disturbances varies from other manufacturers' models. The Company appears to believe that the "poor" and "unacceptable" results are due to the deficiencies in wind turbine models used in the dynamic stability analysis.

demonstrate that the currently proposed Transmission Projects are sufficient to reliably interconnect the shortlisted Wind Projects.

Q. Are the assumptions in the most recent transfer capability assessment consistent with the previous versions of this study?

A. No. Certain study assumptions with respect to the composition of the D.2 Project have been modified in the Transfer Capability Assessment. Additionally, with respect to generation composition, the Wyodak and Dave Johnston generation levels were not consistent with the October 2017 Study. Additional generation from northern Wyoming was considered for dispatch in the new study relative to the assumptions in the October 2017 Study. The transfers between PACE and Montana regions also show differences from the October 2017 Study.

Q. What were the changes in the composition of the D.2 Project included in the most recent transmission planning studies?

A. The D.2 project consists of 18 individual system improvements.[94] There were several changes assumed in the new study:

- The Aeolus 230 kV shunt reactor was modified by increasing the assumed size from 50 MVAR to 60 MVAR.
- A new 60 MVAR shunt reactor was assumed to be added to Shirley Basin 230 kV.

[94] Attachment to RMP's First Supplemental Response to Data Request DPU 21.1, *Aeolus West Transmission Path Transfer Capability Assessment* (March 30, 2018), p. 4.

- The Aeolus-Shirley Basin 230 kV #1 and #2 lines were assumed to be reconductored using 2x1557 ACSS/TW instead of the previously assumed ACSR/TW conductor.

With respect to dynamic reactive device at Latham substation, the Company has indicated that it "identified two possible solutions (SVC vs. STATCOM) for the dynamic voltage controller at Latham" and that "SVC sizing studies will be redone in the near future."[95] The Transfer Capability Assessment did not indicate a specific solution or a size for the dynamic Latham reactive device, indicating that the Latham solution has not been resolved at this time.

Q. Has the Company provided any documentation of the reasons for these changes and additions to the D.2 components in the study?

A. No, it has not.

Q. Is there a significance to these study assumption changes with respect to the transfer capability of the Aeolus West path?

A. Yes. These changes are significant enough to affect the Aeolus West path transfer capability. The updates to the D.2 Project composition provide addition reactive support to the region. Additionally, by adjusting existing generation composition, the Company readjusted thermal unit generation on the constrained side of the interface, thereby essentially freeing-up transfer capability on the Aeolus West path. If the system can be operated reliably with the thermal units operating at these low levels, it is not clear why

[95] RMP's Response to Data Request DPU 14.6(c).

the Company used different assumptions in prior versions of the transfer capability analysis.

Q. How do these changes in assumptions present potential risk to customers?

A. The new components added to the Transmission Projects in the new studies will certainly add cost to the project that has not previously been considered, as these components were not identified in Mr. Vail's testimony.[96] The other component changes that may be needed could potentially add costs to those already identified by the Company. Also, once the Company makes its final determination of the specific type and size of dynamic device to be installed at Latham, the network upgrade costs could potentially increase over the previously assumed costs. At this point, the Company has not provided any revised cost estimates for the additional D.2 components included in these new studies.

In addition, the change in assumed transmission components could present additional risk to ratepayers if the change pushes the commercial operation date of the Combined Projects to be delayed beyond December 2020.

Q. Do you have concerns with the transfer capability assessment methodology?

A. Yes. A transfer capability study should include all valid/active interconnection queue projects that would be in-service by the start of the study period. This was distinctly not observed in the transfer capability studies performed by the Company for the Transmission Project.

[96] Supplemental Direct and Rebuttal Testimony of Rick A. Vail, lines 58 – 81.

The October 2017 Study considered projects with queue positions Q0409, Q0706, Q0707, Q0708 and Q0863 to be in-service while the March 30, 2018 study considered projects with queue positions Q0542, Q0706, Q0707, Q0708, Q0712, Q0715 and Q0810. This inconsistent treatment of queue projects is concerning.

Q. Please identify the changes to the generating facility additions in the Transfer Capability Assessment?

A. Relative to the October 2017 Study, the new studies added Bowler Falls Q0542, Ekola Flats Q0706, Uinta I Q0715 and Uinta II Q0810 and removed Boswell Q0409 and McFadden II[redacted].

The Bowler Falls Q0542 and Boswell Q0409 are both qualifying facilities (QFs), and the generation from these resources does not contribute to the benefits of the Combined Projects.

Q. Did the replacement of Q0409 with Q0542 impact the Aeolus West transfer capability?

A. Yes. Q0409 is electrically very close to the Aeolus West path as well as the highly congested Platte-Latham 230 kV transmission element. Q0542 is geographically located farther north, and is electrically more removed from the area with the most congested system elements. This difference in electrical location is significant in the calculation of the transfer capability of the Aeolus West path, because the generation from Q0542 will be distributed across more lines. [redacted]

[redacted].[97] By removing Q0409 from a location close to congestion and replacing this with Q0542 in northern Wyoming, the Company was able to demonstrate an increase in transfer capability on the Aeolus West path and integrate additional wind capacity as part of the Combined Projects.

Q. What was the reason provided by the Company behind the replacement of Q0409 with Q0542?

A. The Company indicated that Q0409 project [redacted][98] [redacted]

Q. Are there any projects in the shortlisted Wind Projects that have an executed interconnection agreement with dependencies on Gateway West and Gateway South projects, [redacted]?

A. Yes. Ekola Flats Q0706 has an executed interconnection agreement and requires the addition of the Gateway West and Gateway South projects, which the Company claims are currently planned for 2024. This means that the Ekola Flats Q0706 [redacted].

97 RMP's Response to Data Request DPU 25.2(b).

98 RMP's Response to Data Request DPU 25.2(a).

Q. Do you have concerns with the selection of Q0706 [redacted]?

A. [redacted]

The Company indicated that it had decided not to reassess the SIS for Q0706 assuming unavailability of Gateway South project and acceleration of the D.2 segment of Gateway West.[99] The Company instead decided to update the interconnection agreement for Q0706 [redacted]

Q. Has the Company applied consistent treatment to queue position projects in the new studies?

A. No, it is not evident that it has. It is not clear why Q0409 was included in the October 2017 Study and not included in the new studies and, similarly, why Q0542 was omitted in the October 2017 Study and added in the new studies. These changes materially improve the transfer capability results in the new studies. The inclusion of Uinta projects (Q0715 and Q0863 projects) further decreased the stress on the Aeolus West path,

[99] RMP's Response to Data Request DPU 22.13.

thereby further increasing its transfer capability. Based on these findings, I do not agree that the Company has been consistent in selection of the generating facilities in the Transfer Capability Assessment and the shortlisted Wind Projects.

Q. Do the SIS for all shortlisted Wind Projects demonstrate the projects' ability to fully deliver power to the network load?

A. No. The SIS for TB Flats I Q0707, TB Flats II Q0708 and Cedar Springs Q0712 state that, in addition to the identified network upgrades for each of these projects, completion of additional Energy Gateway projects and other system improvements would also be required to ensure 100 percent deliverability of the wind energy. Inability to deliver 100 percent of wind energy from the shortlisted Wind projects could lead to potential curtailment of their outputs.

Q. Is the Company intending to perform addition studies to determine the extent of additional upgrades to ensure 100 percent deliverability to network load for the three queue projects listed above?

A. No. The Company has stated that it "plans to use its network transmission service rights to deliver" these projects' power to network load.[100] Essentially, the Company intends to redispatch its non-wind resources to enable full delivery of the wind energy.

[100] RMP's Response to Data Request OCS 12.4(e).

Q. Can the Company assure 100 percent deliverability for the above-listed queue projects (TB Flats I and II and Cedar Springs) to network load using its network transmission service rights?

A. No. There is no guarantee that the Company would be able to dispatch other resources in the region to maintain 100 percent deliverability from these three shortlisted queue projects. In the absence of a deliverability assessment and any upgrades associated with full deliverability, this would be real-time operational decision by the Company.

Q. Does this deliverability issue pose a risk to ratepayers?

A. Yes. If the Company cannot fully deliver the wind energy and curtailment is required, the PTC revenue would be reduced, and the system benefits associated with the incremental wind energy, as estimated in Mr. Link's analysis, would be reduced. This poses a risk that the projects could provide less net benefits to customers or could impose net costs to customers.

Q. Please summarize the risks to ratepayers you have identified in your review of the Company's transmission studies.

A. Based on my review of the new transmission studies, I observe that:

- The Company's transfer capability assessment is still "preliminary" and requires potential updates to the wind turbine models, which in turn might trigger additional network upgrades or revisions to completed SIS.
- The Company has changed certain key assumptions between the October 2017 Study and the March 30, 2018 Transfer Capability Assessment which alter the

components of the Transmission Project and raise questions on consistency in study methodology.

- The new studies include elements that would add cost to the Transmission Projects and identify issues and further studies yet to be done that could potentially add to those cost increases. These cost increases have not been included in the Company's economic analysis.

- The Company has not exercised consistent treatment of new generation projects from the interconnection queue in its transfer capability studies.

- The addition of Ekola Flats Q0706 in the Transfer Capability Assessment indicates inconsistency in treatment of eligible interconnection queue projects.

- The replacement of Boswell Q0409 with Bowler Flats Q0542 in the Transfer Capability Assessment appears inconsistent with the October 2017 Study and policies for queue position priority. This change provides an advantage to short-listed Wind Projects by increasing the transfer capability for those projects.

- The short-listed Wind Projects are not assured 100 percent deliverability and are subject to curtailment which could erode the energy and PTC benefits associated with the Combined Projects.

The Company's transmission studies remain preliminary at this stage. The studies performed by the Company as presented demonstrate that the Transmission Project will

not fully be able to integrate the shortlisted Wind Projects. The successful integration of the Wind Projects and full deliverability of their output is a risk to ratepayers.

H. Other Significant Risks Remain

Q. Are there other remaining risks to ratepayers associated with the Company's proposal?

A. Yes. I have discussed several risks that could reduce or eliminate the ratepayer benefits associated with the proposal. There are still other remaining risks which I originally discussed in my Direct Testimony, including those associated with natural gas prices, project generation, project construction timing, and wind project costs.[101] These are all risks borne entirely by ratepayers.

Q. Please describe the risks associated with natural gas prices.

A. The Company's modeling and economic analysis relies on several key assumptions, including natural gas price forecasts. In my Direct Testimony, I noted that the three natural gas price scenarios were skewed high when compared to then-current forward prices. Higher gas prices yield higher estimates of benefits of the Combined Projects. The Company has updated its natural gas prices, but I continue to believe that they are generally overstated. If actual gas prices trend closer to the low gas scenario forecast (or even below the forecast), the benefit estimates presented by the Company would be

[101] Direct Testimony of Daniel Peaco, Section VI.

overstated and ratepayers would be exposed to the risk of increased costs from the projects, rather than net benefits.

Q. Please describe the risks associated with production levels from the wind projects.

A. As I discussed in the surrebuttal portion of my testimony, the Company's economic analysis relies on assumptions of output from the wind resources. The generation from the wind resources provides PTC benefits, as well as a reduction in net power costs from other generation or market purchases. The Company's assumptions regarding output levels, however, are based on estimates of P50 values. If the actual output of the resources is lower than the estimates, the benefits of the projects will be directly reduced.

Q. Please describe the risks associated with project timing.

A. In my Direct Testimony I noted that, since the Wind Projects must be operational by the end of 2020 to receive full PTC credit, and the Transmission Projects are required to interconnect the Wind Projects, there was significant risk that even a short delay in construction of any component of the Combined Projects could have an adverse impact on benefits.

The Company has since asserted that all components of the Transmission Projects do not need to be in service in order to interconnect the Wind Projects, and that even if all the wind energy is not immediately deliverable (and must be curtailed), the Company will implement a "round robin" strategy to allow generation from the wind projects on a rotating basis.[102]

[102] RMP's Response to Data Request DPU 19.1.

Even under the Company's proposal, any delay in the project schedule that either prevents full qualification for PTCs or reduces the amount of delivered wind energy from the new resources will reduce gross benefits and poses a risk to ratepayers.

Q. Please describe the risk associated with wind project costs.

A. The Company's final shortlist Wind projects includes four projects totaling 1,311 MW with 1,111 MW coming from facilities that the Company will own and operate (Company Benchmark Projects or Build-Transfer Projects) and 200 MW secured with a power purchase agreement (PPA).[103] The Company-owned facilities pose a cost risk to customers. Bates White, the Independent Evaluator for the 2017R RFP in Oregon, identified two issues associated with ratepayer risks of the Company-owned Wind Projects. First, they recommended that the Company-owned projects be subject to a hard cost cap with no opportunity for the Company to seek recovery of costs above that cost level to provide the ratepayers the same level of price certainty that the bids offering that certainty in a PPA. Second, they recommend that the Company guarantee full PTC benefits to ratepayers consistent with the requirements placed on bidders offering PPAs.[104] The Company's application does not provide those assurances to Utah ratepayers. Instead, the Company offers a soft cap based on the estimated costs of the Combined Projects and is asking the ratepayers to bear the risk that the Company does not secure 100 percent of the PTCs assumed in its analysis. The Company's election to

[103] Second Supplemental Testimony of Chad A. Teply, lines 31-37.

[104] Rock Creek Exhibit No. 1001.1 form Wyoming Docket 20000-520-EA-17, redacted version of the Oregon Independent Evaluator's Final Report on PacifiCorp's 2017R Request for Proposals, February 16, 2018 page 4 of the report. Also included in Replacement Exhibit RMP_RTL-9SS, page 34 of 163.

choose projects that will be owned by the Company rather than the PPA alternatives should not place added risk to ratepayers.

Q. Are there additional risks remaining?

A. Yes. I have highlighted some key risks here, but my list is not exhaustive, and others still remain.

Q. What do you conclude regarding the additional risks you have described?

A. The risks I have described here all have the potential to reduce or eliminate net benefits to ratepayers, or impose net costs to customers, and the Company is not willing to bear any of the associated risk. As I have discussed in my testimony, the Company's estimates of net benefits, which I believe are overstated, provide little or no margin. If any of the uncertainties or risks I have identified end up reducing the gross benefits of the Combined Projects, there is a high likelihood that ratepayers will be worse off than without the Combined Projects.

IV. Conclusions and Recommendations

Q. Does the Company's analysis demonstrate that the Combined Projects will deliver cost-effective energy to Utah ratepayers?

A. No, it does not. The Company's analysis of the Combined Projects does not provide a high degree of assurance that they will be cost effective for Utah ratepayers. A number of the scenarios evaluated by the Company produce either net cost or very limited net benefits.

Q. Is the Company's modeling analysis of the Combined Projects sound and does that analysis provide an accurate representation of the economic benefits of each of the Combined Projects?

A. No, it is not. The Company's modeling remains problematic for the longer-term analysis that relies on an extrapolation of the results from the 20-year modeling for values in the years 2037-2050. The Company's 20-year results now include front-loaded PTC benefits that cause the 20-year results to be an unsuitable metric to use for decisions on the economic merits of the Combined Projects.

Q. Does the Company's analysis provide a reasonable representation of the all of the uncertainties that have bearing on the risk to Utah ratepayers?

A. No, it does not. The Company has not provided any analysis on several key risks that, as proposed, are risks that would be borne by ratepayers. These risks include uncertainty regarding the ability of the projects to qualify for production tax credits, project cost uncertainty, project energy production estimate uncertainty, the Transmission Projects increase in transfer capability and ability to support 1,311 MW of new Wind Projects, Transmission Projects permitting risk, and Transmission Project revenues. I have described these risks and have shown that they are of sufficient magnitude to have the potential to outweigh the benefits that the Company has put forth.

Q. Are the Combined Projects likely to be lowest reasonable cost resources?

A. No, they are not. The Company's own analysis demonstrates that the economics of the Combined projects are worse than shown in the Direct Testimony and shows low value to ratepayers, including cases with negative value. Given the issues I have identified with

the Company's modeling and the lack of consideration of several important risk factors, the Company's results do not support the assertion that these projects are lowest reasonable cost. Further, the Company did not reasonably consider the alternative to the Combined Projects, including the response to the Solar RFP, other wind resources, or alternative transmission solutions, meaning there is no information presented by the Company that this combination of wind and transmission is the lowest cost or highest benefit option available.

Q. What are the short-term and long-term impacts to Utah ratepayers?

A. The Company's presentation on the projects relies on significant benefits in the first ten years resulting from PTC qualification. The PTC benefits, if fully realized, would mitigate much of the cost in the first 10 years, however, the risks regarding PTC qualification could materially alter that outlook. The benefits in the second half of the Project lives have been estimated using an extrapolation analysis that is problematic.

Q. Based on your findings, what are your recommendations at this time?

A. I recommend that the Commission deny the Company's request that the Combined Projects be not be approved. I further recommend that the Company submit a separate analysis of the Uinta Project if it wishes that project to be considered.

Q. Does this conclude your testimony?

A. Yes, it does.