ITEM NO. 4

PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: December 5, 2017

REGULAR	X	CONSENT	____	EFFECTIVE DATE	Upon Commission Order

DATE: November 21, 2017

TO: Public Utility Commission

FROM: Nolan Moser and Lisa Gorsuch

THROUGH: Jason Eisdorfer and JP Batmale

SUBJECT: PACIFIC POWER: (Docket No. LC 67) Acknowledgement of 2017 Integrated Resource Plan.

STAFF RECOMMENDATION:

That the Commission acknowledge in part and decline to acknowledge in part PacifiCorp's (PAC or Company) 2017 Integrated Resource Action Plan. Staff recommends certain action and additional requirements for inclusion in an IRP update or the next IRP.

SUMMARY OF STAFF RECOMMENDED ACTIONS:

As discussed below, Staff recommends certain actions and additional requirements for inclusion in an IRP update and in future IRPs. Staff also summarizes and addresses many comments. Comments from all parties are available for review in the case record.

RENEWABLE ACTION ITEMS

- 1a – Wind Repowering – Repower over 900MW of existing wind resources.
  Recommendation: Not Acknowledge

- 1b – New Wind – Issue an RFP for up to 1,270 MW of new wind resources.
  Recommendation: Not Acknowledge

- 1c – RFP for RECs – Issue an RFP for RECs to meet state RPS compliance requirements as needed.
  Recommendation: Acknowledge

- 1d – REC Optimization –Re-allocate and sell RECs as appropriate for compliance purposes.
  Recommendation: Acknowledge

TRANSMISSION ACTION ITEMS

- 2a – Aeolus to Bridger / Anticline – Build a 140-mile 500kV transmission line from the Aeolus substation to the Jim Bridger Power Plant.
  Recommendation: Not Acknowledge

- 2b – Energy Gateway Permitting – Continue efforts to permit and implement the Energy Gateway transmission plan.
  Recommendation: Acknowledge

- 3c – Wallula to McNary Construction – Complete the Wallula to McNary project construction, with a 2018 expected in-service date.
  Recommendation: Acknowledge

- 4d – Planning Studies – Complete planning studies, including for proposal coal unit retirement assumptions.
  Recommendation: Acknowledge

FIRM MARKET PURCHASES

- 3a – Front Office Transactions – Acquire economic short-term firm market purchases for on-peak summer deliveries from 2017 to 2019.
  Recommendation: Acknowledge

DEMAND SIDE MANAGEMENT

- 4a – Class 2 DSM – Acquire cost-effective Class 2 DSM (energy efficiency).
  Recommendation: Acknowledge with modifications.

COAL RESOURCE ACTIONS

- 5a through 5h – Complete economic analysis subject to litigation outcomes, regional haze analysis, natural gas conversion analysis, and review of other actions.
  Recommendation: Acknowledge subject to the following modifications:
  a) Perform 25 System Optimizer (SO) runs – one for each coal unit and a 'base case.'
  b) Provide the results of the SO runs to parties in LC 67 by March 30, 2018.

c) Provide a summary report resulting from the early retirement of each unit.

NEW ACTION ITEM FOR NEXT IRP (PAC SUGGESTED)

- Additional Statistical Analysis
  Recommendation: Acknowledge subject to the following modifications:
  a) Explain the reasons for the (sometimes) low correlations in the short-term forecast.

- Flexible Reserve Analysis
  Recommendation: Acknowledge

ADDITIONAL RECOMMENDATIONS / GENERAL IRP COMMENTS (STAFF SUGGESTED)

- Distribution System Planning - Direct the Company to work with Staff and other parties to advance representation in the IRP and to define proposal for opening investigation.
  Recommendation: Acknowledge

- SmartGrid Report - Work with Staff and other parties to explore the use of AMI data in its integrated resource planning in future IRPs.
  Recommendation: Acknowledge

- Compliance with Order 16-174, UM 1610 – Either comply with Order or explain why the Company cannot.
  Recommendation: Acknowledge

DISCUSSION:

Issue

Whether the Commission should acknowledge PAC's 2017 Integrated Resource Plan (IRP), acknowledge specific portions of the IRP with or without certain conditions, or decline to acknowledge the IRP.

Applicable Rule or Law

The Commission adopted least-cost planning as the preferred approach to utility resource planning in 1989.[1] In 2007, the Commission updated its existing least-cost planning principles and established a comprehensive set of "IRP Guidelines" to govern

[1] Order No. 89-507.

the IRP process. The IRP Guidelines found in Order Nos. 07-002 (corrected by 07-047) and 12-013 clarify the procedural steps and substantive analysis required of Oregon's regulated utilities in order for the Commission to consider acknowledgement of a utility's resource plan.[2]

The IRP Guidelines and Commission rules require a utility to file an IRP with a planning horizon of at least 20 years within two years of its previous IRP acknowledgment order, or as otherwise directed by the Commission.[3] Further, the IRP must also include an "Action Plan" with resource activities that the utility intends to take over the next two to four years.[4] The ultimate goal of the IRP is to select the "portfolio of resources with the best combination of expected costs and associated risks and uncertainties for the utility and its customers."[5] This is often referred to as the "least cost/least risk portfolio."

The Commission reviews the utility's plan for adherence to the procedural and substantive IRP Guidelines and generally acknowledges the overall plan if it is reasonable based on the information available at the time.[6] However, the Commission explains: "We may also decline to acknowledge specific action items if we question whether the utility's proposed resource decision presents the least cost and risk option for its customers."[7]

Analysis

Procedural History

The series of public input meetings, which initiated PAC's 2017 IRP process, began in June of 2016. This process included five state meetings and seven general meetings between June of 2016 and March of 2017.

PacifiCorp requested and was granted a unique treatment of its RFP in Docket No. UM 1845: "PacifiCorp proposes to conduct the solicitation process concurrently with the Commission's review of the 2017 IRP."[8] IRP guideline 7 requests comment from stakeholders on the nature of RFP alignment with an acknowledged IRP.[9] Because of

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[2] Order Nos. 07-002 and 07-047. Additional refinements to the process have been adopted: *See* Order No. 08-339 (IRP Guideline 8 was later refined to specify how utilities should treat carbon dioxide (CO2) risk in their IRP analysis); Order No. 12-013 (guideline added directing utilities to evaluate their need and supply of flexible capacity in IRP filings).
[3] Order No. 07-002 (Guidelines 1(c) and 3(a)) and OAR 860-027-0400.
[4] Order No. 14-415 at 3.
[5] Order No. 07-002 at 1-2.
[6] *Id.* at 1.
[7] *Id.*
[8] UM 1845, PacifiCorp's Application, p.2.
[9] Order No.14-149, Appendix A at 3.

PacifiCorp's request to move forward with an RFP prior to acknowledgement, basing its RFP or aligning its RFP on a Commission acknowledged IRP was not possible. The Commission accommodated PacifiCorp's request through Order 17-345, which conditionally approved PacifiCorp's 2017R RFP.

The Final IRP was filed on April 4, 2017. A prehearing conference then convened on April 28, 2017, which initiated the following:

- PAC presented an overview of its 2017 IRP at a regular public meeting on May 30, 2017,
- PAC filed a request for proposals (RFP) for resources identified in this IRP on June 1, 2017.
- Staff and parties filed opening comments on June 23, 2017,
- A workshop was held with all three Commissioners (special public meeting) on July 10, 2017, and
- PAC filed reply comments and filed Energy Vision 2020 Update on July 28, 2017.

Following the filing of PAC's Energy Vision 2020 Update a second prehearing conference was held to extend the schedule, which took place on August 9, 2017. The following resulted from the second prehearing conference:

- A stakeholder workshop convened on August 17, 2017,
- Parties filed an additional round of comments on August 24, 2017, to address PAC's Energy Vision 2020 Update, and
- A second workshop was held with all three Commissioners (special public meeting) on September 14, 2017.

Docket No. LC 67 Parties' agreed upon, and received an extension to the existing schedule in a ruling from the Administrative Law Judge on September 21, 2017, which directed the balance of the dockets schedule as follows:

- Staff filed final comments and recommendations on October 6, 2017,
- All parties were able to file comments on Staff's final comments and recommendations on October 30, 2017,

- Staff's public meeting memo (this report) will be posted in Docket No. LC 67 on November 21, 2017,
- All parties will file comments on Staff's public meeting memo (this report) on November 28, 2017, and
- Staff's public meeting memo (this report) will be delivered before the Commission on December 5, 2017, at a public meeting.

Action Plan Discussion

The balance of this report delves into PAC's proposed Action Items, shares the positions of parties and the Company, and provides additional Staff recommendations on the Company's 2017 IRP. PAC's 2017 Action Plan, contained in Chapter 9 of Docket No. LC 67, can be found in Attachment A of this report.

RENEWABLE ACTION ITEMS

Overview

PacifiCorp proposes the addition of three major system resources as part of its 2017 IRP process. PacifiCorp proposes Action Items 1a (wind repowering), 1b (new wind), and 2a (new transmission from Aeolus to Bridger/Anticline).

New Wind and Transmission: PacifiCorp's Action Plan states that: "PacifiCorp will issue a wind resource request for proposals (RFP) for at least 1,100 MW of Wyoming wind resources that will qualify for federal production tax credits and achieve commercial operation by December 31, 2020."[10] This wind acquisition is tied to a transmission action. "By December 31, 2020, PacifiCorp will build the 140-mile, 500 kV transmission line running from the Aeolus substation near Medicine Bow, Wyoming, to the Jim Bridger power plant (a sub-segment of the Energy Gateway West transmission project). This includes pursuing regulatory review and approval as necessary."[11]

PTC availability is a major driver of the project:

> This time-sensitive project requires that the new wind and transmission assets achieve commercial operation by the end of 2020 to fully achieve the benefits of federal wind production tax credits (PTCs). In addition to providing significant economic benefits for PacifiCorp's customers, the

[10] *See* p. 265 of IRP.
[11] *See* p. 266 of IRP.

> wind and transmission project will provide extraordinary economic development benefits to the state of Wyoming.[12]

PacifiCorp issued a wind resource request for proposals that includes all wind that can interconnect to its transmission system in any of the states in its service territory. This RFP was issued without the acknowledgement of an IRP that included those resources.

Wind Repowering: PacifiCorp also proposes a major wind repowering investment. PacifiCorp's action plan states that: "PacifiCorp will implement the wind repowering project, taking advantage of safe-harbor wind-turbine-generator equipment purchase agreements executed in December, 2016."

The Company describes the project as follows:

> PacifiCorp executed wind-turbine generator (WTG) equipment purchases in December 2016 to preserve the option to repower existing wind generation facilities and obtain PTC benefits for customers. Analysis performed in the 2017 IRP supports repowering 905 MW of existing wind resources by the end of 2020 and demonstrates that this exciting project will save customers hundreds of millions of dollars. The scope of the repowering project involves installing new systems, the repowered wind facilities will produce more zero-emission energy for a longer period of time at reduced operating costs. Existing towers and foundations will remain in place, resulting in minimal environmental impact and permitting requirements.[13]

PTC availability is also a major driver of this project.

Parties' Positions
Citizens' Utility Board (CUB): In its final comments, CUB does not recommend acknowledgement of the new wind and associated transmission. CUB notes that this IRP has been challenging in that PAC did not identify a resource need in its technical workshops, but instead proposed over $3 billion in resource investments at the end of the workshops. They note that due to this timing, parties were not able to identify the full universe of economic opportunities that PAC should evaluate.

CUB emphasizes that resource need is essential to least cost/least risk planning and that resource investments contain risks. CUB cites Staff's demonstration that *small* changes in a number of project elements can eliminate some or all of customer benefits,

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[12] Id.
[13] *See* p. 3 of IRP.

and indicate the actual risks associated with resource investments are much greater than Staff's sensitivities. CUB also notes that if there is a resource need, then there is justification to have customers bear these risks, but that without need, much of that justification disappears. CUB suggests economic investments could be placed into rates using an "alternative form of regulation," or "AFOR," which would require a showing of net benefits.

CUB does not make an acknowledgement recommendation regarding the wind repowering projects; however, Staff understands CUB to be in support of the wind repowering investment. CUB asserts that the project should be considered as management of existing assets rather than procurement of new assets, stating that "utilities are generally expected to manage their rate-based assets in the best interest of customers."[14]

NW Energy Coalition (NWEC)
NWEC supports acknowledgement of the wind repowering project. However, NWEC suggests a conditional acknowledgement of the Wyoming Wind RFP and an additional solar energy RFP, subject to the completion of a broader transmission assessment. NWEC does not support acknowledgement of the proposed Aeolus-to-Bridger/Anticline transmission project at this time.

NWEC recommends that the Commission require a deeper assessment of transmission needs and solutions, which would be informed by Staff and stakeholder review. A revised action plan would follow. NWEC lists the following as potential alternative solutions to the Aeolus-to-Bridger/Anticline investment:

> Those solutions could include a continued commitment to Sub segment D2, an alternative non-wires strategy, or a combination. Below we describe in more detail how the analysis could be accomplished. We believe this will provide the Commission with sufficient information to make an informed and confident decision on acknowledgment.[15]

Sierra Club
Sierra Club notes that in the IRP, as the primary mechanism by which new and existing resources are assessed, it is important that no resources are excluded from consideration. More specifically, it reiterates the importance of examining the economics of PacifiCorp's existing coal fleet, notes that a number of parties—including Staff—have requested or are interested in this analysis, and refutes PacifiCorp's arguments to delay. Sierra Club argues that a finding that a substantial amount of existing capacity is

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[14] *See* CUB Comments on Staff's Recommendations, page 9.
[15] *See* NWEC's Final Comments, filed October 30, 2017, page 3.

noneconomic and would require a substantial re-consideration of many of the assumptions underlying the IRP, including the Company's assessment of need or economic viability for the new wind and transmission projects.

Industrial Customers of Northwest Utilities (ICNU)
ICNU recounts PacifiCorp's analysis results, which estimates that the Company's proposed wind projects will reduce costs to customers, as measured under the present value revenue requirement ("PVRR") standard, by $85 to $111 million over the 20-year IRP period. ICNU states that the Company's economics are based mostly on speculative and baseless assumptions. ICNU goes on to say:

> Table 5.14 of the IRP clearly shows that available front office transactions of 1,670 MW exceed the system position by a wide margin through the first ten years of the study period. Accordingly, the proposal cannot be reasonably characterized any other way than as an economic tradeoff between existing market resources and the new wind and transmission.[16]

ICNU states that it has found flaws in the Company's modeling assumptions, showing the results of excluding some of the more speculative assumptions in PacifiCorp's analysis in Table 1 on page 11 of ICNU's comments. The Table contains confidential information. The non-confidential aggregate impact is negative $414 million versus the Company's estimated positive $85 million - $110.

ICNU raises a concern regarding PacifiCorp's "one-sided, out-of-model adjustments," like the additional benefits of approximately $64.5 million, on a net PVRR ("NPVRR") basis, over a 20-year period that were estimated by the Company through GRID studies it performed when calculating the benefits of the Energy Vision 2020 project. The studies were described as using reduced line losses, reliability benefits, and EIM benefits to arrive at the forecasted benefits of $64.5 million. ICNU is concerned that line losses would increase, rather than decrease, with the addition of new resources in remote Wyoming, and that there is an inconsistency between how the PacifiCorp modeled EIM in GRID studies versus the way that the EIM benefits were established by the Company in its annual TAM filings.

ICNU states, "Like Staff, ICNU "does not recommend a deviation from a need-based IRP standard" to accommodate Energy Vision 2020 investment, and similarly "recommends against acknowledging Action Items 1a, 1b, and 2a." PacifiCorp's response to ICNU Data Request 19, shown in Attachment A to ICNU's comments, confirms that it is possible that any projected benefits resulting from tax benefits could be eliminated if current tax reform efforts were to come to fruition. Nonetheless, should

[16] ICNU's Comments on Staff's Recommendations, p.8-9.

the Commission choose to acknowledge these Action Items, ICNU also "urges the Commission to provide detailed guidance on how it anticipates [that] it will evaluate these economic opportunities when PacifiCorp seeks rate recovery." ICNU also states that it "supports Staff's specific recommendation for the plain articulation of "... strong protections that hold ratepayers harmless for the unnecessary risk and potential cost of the economic opportunity in a subsequent ratemaking proceeding."[17]

Renewable Energy Coalition (the Coalition)
In its final comments, the Coalition states that the resource need underlying the new wind should be acknowledged, but not the site-specific plan to fill that need. The Coalition argues that if resources are needed system-wide, they should be acquired anywhere on the system that is cost effective. It notes that in Docket No. UM 1610, the Commission directed the Company to evaluate the benefits of the capacity contribution provided by existing qualifying facilities (QFs) in its next IRP. The Coalition also cites the relevant Commission Order:

> We agree with Staff and the Joint QFs that a certain amount of capacity deferral may not be valued when utilities assume in their IRPs that existing QFs nearing contract expiration will automatically renew. We direct each utility to work with parties to address this issue in its next IRP.[18]

The Coalition notes that, while in the text of the IRP it is stated that purchases from small QFs are extended through the end of the IRP study period, this was subsequently found not to be the case. It asserts that PacifiCorp took action regarding its treatment of QFs specifically to avoid complying with Commission Order No. 16-147.

The Coalition concludes: "The final Staff report should recommend, and the Commission should ultimately adopt, a requirement for PacifiCorp to calculate the capacity value provided by QFs under contract."[19]

Oregon Department of Energy (ODOE)
ODOE stated, in its comments on Staff's final recommendations, "the department generally supports acquisition of renewable energy resources earlier rather than later in the 20-year planning timeframe."[20] However, ODOE discussed its lack of confidence in the information presented by PAC resulting from the Company's failure to allay

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[17] Id. p. 18.
[18] Re Investigation Into QF Contracting and Pricing, Docket No. UM 1610, Order No. 16-174 at 2 (May 13, 2016).
[19] Renewable Energy Coalition's Comments Regarding Staff Recommendation, p.5.
[20] Comments by the Oregon Department of Energy on Staff's Recommendations, p.1-2.

concerns about risks. ODOE noted risks were primarily related to tight timelines and the commercial operation date deadline related to capturing the federal PTC.

ODOE generally supported Staff's analysis with regard to risk, noting that Staff's analysis included the elements of risk delineated by ODOE but also isolated additional risks not raised by it. ODOE stated, "Should the Commission decide to acknowledge the wind repowering, new wind, and/or transmission expansion, a cost containment mechanism is warranted to protect customers from cost overruns, financial implications of delay of commercial operation, or lower than expected revenue from the projects."[21]

ODOE recommended that risks associated with acquiring more renewable energy be analyzed in the next IRP cycle, including potential risks and benefits of the Company adopting a "glide path" approach to renewable resource acquisition as compared to a step-function acquisition plan.

ODOE concludes that it has ongoing concern regarding potential overestimation of the availability of front office transactions (FOTs) to serve PAC's customers. ODOE recommends that PAC be required to perform a more in-depth analysis of price escalation for FOTs incorporating seasonality with separate runs for summer and winter. ODOE also recommends that PAC be required to complete analysis of energy efficiency and demand response as a hedge to any price risks associated with high levels of FOTs.

Renewable Northwest
Renewable Northwest disagrees with Staff's recommendations that the Commission not acknowledge Action Items 1a, 1b, and 2a in PacifiCorp's 2017 Action Plan, and recommends acknowledgement of all three projects.

Renewable Northwest states "PacifiCorp has shown that its plans for repowering, new wind, and transmission are reasonable,"[22] and asserts that acknowledgment is based on reasonableness and not near-term need.

Renewable Northwest also states "the displacement of market purchases, also called front office transactions ("FOTs"), by renewables and other resources has been a feature of the IRP since the Company filed it on April 4, 2017,"[23] disagreeing with Staff's assertion that this was raised by PacifiCorp for the first time at the workshop held in September.

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[21] Id.
[22] LC 67 Renewable Northwest's Comments on Staff's Recommendations, p.2.
[23] Id.

Renewable Northwest states, "Staff mistakenly claims that the risk being hedged with FOTs is the "ability of the utility to safely and reliably serve customers". In addition, Renewable Northwest argues that, "Staff's criticism of renewable generation is based upon an incorrect understanding of capacity contribution."

Renewable Northwest states that it, "disagrees with Staff's recommendation that the Commission not acknowledge Action Items 1a, 1b, and 2a and continues to recommend that the Commission acknowledge these three action items." Renewable Northwest indicated in its comments that the PacifiCorp's 2017 IRP does not require the Commission to include "customer protections" in order to acknowledge Action Items 1a, 1b, and 2a, but said that the Commission could opt to signal to a utility in an IRP order what it would likely consider in a future rate case.

Northwest and Intermountain Power Producers Coalition's (NIPPC)
NIPPC stated in comments filed on June 23, 2017 that it supported the IRP's Action Plan's proposal to acquire renewable resources. While NIPPC was supportive of PacifiCorp identifying its preferred resources and location, NIPPC indicated that the Company had not demonstrated that only Wyoming wind resources and the associated Aeolus to Bridger/Anticline transmission line are the least cost and risk mix of resources to meet the Company's upcoming renewable resource needs. NIPPC explained that PacifiCorp had not performed adequate, transparent analysis to support its plan to acquire only Wyoming generation and new transmission.

NIPPC went on to argue that PacifiCorp should not discriminate against other potentially lower cost generation types, which PacifiCorp does not plan to consider until the 2028 to 2036 timeframe.

Finally, NIPPC recommended that the Commission should decline to acknowledge PacifiCorp's proposal to repower 905 MW of its existing wind projects based on the fact that PacifiCorp had not provided sufficient economic analysis to demonstrate that this is reasonable based on the information available to the Commission at this time. In addition, NIPPC argued that if PacifiCorp moves forward with repowering, it should be required to open the process to a competitive bid, and should include using the repowering as a benchmark resource to bid each Company-owned resource proposed for repowering in the upcoming renewable request for proposal ("RFP").

National Grid USA
National Grid filed its initial comments on June 23, 2017,[24] and is supportive of the proposed resource actions in the first 10 years of the IRP planning window, i.e., the

[24] National Grid did not file final comments. Its initial comments can be found at http://edocs.puc.state.or.us/efdocs/HAC/lc67hac143730.pdf

wind repowering and Wyoming wind and transmission projects. National Grid does not support the proposed resource actions in the second 10 years of the IRP planning window, which include the procurement of new natural gas-fired power plants.

National Grid states that "PacifiCorp should be required to do further analysis of flexible capacity that can cost-effectively integrate renewables carbon-free and absorb low-cost oversupply."[25] Specifically, National Grid suggests that "... PacifiCorp should be required to do further analysis of flexible capacity that can cost-effectively integrate renewables carbon-free and absorb low-cost oversupply."[26] It imagines a regional analysis study, and notes that this would require cooperation with other utilities, the Bonneville Power Administration, and the California Independent System Operator. National Grid further refines the study definition to be pumped-hydro specific, and provide a description of the elements that the study should include.

Robert J. Procter, Ph.D.
Robert J. Procter support's Staff's conclusion that action items 1a, 1b, and 2a are not needed, and points out that the Company may take action on these investments at any time utilizing shareholder dollars to capture the value the Company identifies in its economic opportunity analysis.

PacifiCorp
PacifiCorp argues that Staff's view of the IRP process is narrow, and that the Commission has the authority to consider carbon emissions in the context of the IRP process.

Importantly, PacifiCorp argues the Energy Vision 2020 projects help address a growing, 1,000 MW capacity need starting in 2019,[27] In light of this, PacifiCorp argues that Staff's discussion of an alternative framework for the examination of so-called economic opportunities is not appropriate in the current proceeding, but PacifiCorp states that it is "intrigued" by the concepts put forward by Staff, and is open to discussions with Staff and parties "on this topic in a general policy setting."[28]

PacifiCorp further argues that since its IRP includes the retirement of 667 MW of resources by 2020, that retirement supports the need for the Energy Vision 2020 projects.

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[25] National Grid's initial comments, page 1.
[26] Id.
[27] Id. at 8.
[28] LC 67, PacifiCorp's Response Comments at 3.

PacifiCorp argues that acquiring new wind resources now will prevent or defer the acquisition of more expensive resources. PacifiCorp states that "The PTCs affect the timing and economics of the new resource, not the need for the resource."[29] PacifiCorp argues that Staff's position limits the IRP in scope to the near-term only, eliminating the ability to review or act upon long-term factors.[30] PacifiCorp's position on carbon is that the Commission already has the ability to consider carbon, outside least-cost, least-risk bounds, where carbon emission considerations are "consistent with Oregon's energy policy."[31] PacifiCorp states that the Commission can "require utilities to consider in their least-cost plans the likelihood that external costs may be internalized in the future."[32]

PacifiCorp argues that the Aeolus-to-Bridger/Anticline line is needed, because it will "increase reliability and provide other reliability benefits, such as voltage support, that make the overall system more robust."[33] PacifiCorp has also noted that the Wyoming wind and transmission projects are linked, meaning that one will not be built without the other.[34]

PacifiCorp's reply comments also discuss FOTs. Specifically, PacifiCorp notes that the new resources will displace FOTs, and that these new resources will be committed to the system, in contrast to FOTs which are uncommitted.[35] PacifiCorp states that "The Energy Vision 2020 projects would not suppliant committed resources, as Staff suggests, but instead replace placeholder resources with less expensive, firm resource commitments. The Energy Vision 2020 projects would therefore fill an identified resource gap."

PacifiCorp asserts that it has a current RPS compliance shortfall forecasted for 2025 and that deferral of this shortfall by the Energy Vision 2020 projects will provide additional support for the project. The Company states that "the Energy Vision 2020 projects fill a capacity and energy need and are independently justified by economic benefits and the ability to provide the least-cost, least-risk electricity for the current capacity and energy needs, while providing an additional RPS compliance benefit."[36]

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[29] Id. at 9.
[30] Id. 12-13.
[31] Id. at 15.
[32] Id. at 16.
[33] Id. at 26
[34] Staff's Final Comments at 19.
[35] LC 67, PacifiCorp's Response Comments at 6.
[36] Id. at 28.

Staff's Position
As stated above, Staff continues to recommend the Commission not acknowledge the Action Items associated with the new wind, transmission, and repowering projects.

PacifiCorp has not demonstrated a need for the New Wind and Transmission proposals.

IRP Guideline 1a requires the evaluation of "all known resources for meeting the utility's load…" and Guideline 4 c., a minimum requirement, which requires:

> For electric utilities; a determination of the levels of peaking capacity and energy capability expected for each year of the plan, given existing resources; identification of capacity and energy needed to bridge the gap between expected loads and resources; modeling of all existing transmission rights, as well as future transmission additions associated with the resource portfolios tested.[37]

Because PacifiCorp has not clearly identified the size, timing, and nature of its capacity and energy needs, the IRP does not comply with IRP Guideline 1a and Guideline 4c. Specifically, PacifiCorp has not adequately identified the "gap between expected loads and resources" because PacifiCorp has not explicitly identified its capacity needs in 2019, 2020, 2021 or future years. PacifiCorp has offered shifting and conflicting assessments of near term capacity needs.

In final reply comments, Staff argued that the new wind and transmission resources proposed by PacifiCorp were not needed, stating that PacifiCorp's assertion of need was newly introduced and that it conflicted with PacifiCorp PURPA filings, which indicated a 2028 capacity deficiency date. PacifiCorp had mentioned a capacity need of 174 MW in a slide deck that was presented to the Commission and stakeholders on September 14, 2017.[38] PacifiCorp now asserts that Staff has overlooked its claim of need in the IRP and its supporting filings, and that approximately 1,000 MW of capacity is needed in 2019.[39]

Staff notes that this is the *fifth* different expression of capacity need that PacifiCorp has presented in this IRP process. Below are examples of *five* different answers PacifiCorp has provided to the basic and essential question of what PacifiCorp's capacity needs are and when they emerge.

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[37] Order No.14-149, Appendix A at 3. .
[38] *See* page 16 of Staff's Final Comments.
[39] LC 67, PacifiCorp's Response Comments at 8.

PacifiCorp Capacity Need Version 1: Approximately 395 MW in the summer of 2028.

As filed, PacifiCorp's IRP seems to indicate a current capacity need of 395 MW in the summer of 2028, over a decade into the future.[40] PacifiCorp stated after the filing of the IRP that the new proposed wind resources will meet 44 percent of the 2028 capacity shortfall.[41] Notably, this characterization of capacity need is consistent with Staff's interpretation of the capacity deficiency dated asserted by PacifiCorp in UM 1802.[42]

In initial filings PacifiCorp argued that the Energy Vision 2020 resources were not needed, and instead presented an economic opportunity for ratepayers and the Company that was too good to pass up. In early filings, PacifiCorp admitted that the acquisition of these resources was "early," but that it still made sense to acquire the resources because they presented such a compelling opportunity:

> Here, PacifiCorp's thorough portfolio analysis demonstrates that the preferred portfolio is the least-cost, least-risk combination of resources because the early acquisition of PTC-eligible renewable generation provides all-in economic benefits for customers by deferring the need for other resource options in the future. If taking *early action* is the least-cost, least-risk option, then doing so is consistent with the Commission's principles for least-cost planning *even if there is no immediate need for additional resources*.[43]

This characterization of the Energy Vision 2020 resources as "early," and not immediately needed was PacifiCorp's original, and Staff believes accurate understanding of the new wind and transmission projects. It is important to note that Staff agrees with this original understanding of the proposed resources. Staff also acknowledges that if developed, the resources would be "used," and would largely displace market transactions. However, the fact that the resources will be "used" does not mean that they are needed. In early filings, PacifiCorp communicated that this lack of need should not be a barrier to acknowledgement, because the compelling and unique opportunity for low-cost resources:

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[40] Confidential data disks filed with PacifiCorp's 2017 IRP, specifically:
Data Disk 2_CONF\Chapters + Appendix Conf.zip\Chapters + Appendix\Chapter 5 - Load & Resource Balance\ Tbl 5.1 to 5.10, 5.14 to 5.15, Fig 5.4 to 5.7, SO I17 Capacity LnR.xlsm.
Refer to tab "Tbl 5.14 Initial L&R (Summer)" and tab "Tbl 5.15 Initial L&R (Winter)".
[41] *See* PacifiCorp Response to OPUC Data Request 71.
[42] *See* page 17 of Staff's Final Comments.
[43] LC 67 PacifiCorp Reply Comments at 16-17 (emphasis added).

> It would be fundamentally inconsistent with the purpose of least-cost planning if PacifiCorp pursued a higher-cost, higher-risk portfolio that did not include wind repowering *simply because the additional generation was not immediately needed.*[44]

PacifiCorp Capacity Need Version 2: 174 MW by 2021.

On September 14th, 2017, representatives of PacifiCorp discussed a presentation slide deck developed for the Oregon Commission and stakeholders interested in PacifiCorp's 2017 IRP. Slide three in that deck asserted a need for 174 MW of capacity by 2021.[45] As discussed above, the IRP filed in April does not mention a 2021 capacity need.

Not only was this claim of capacity need new to Staff in Oregon, it was new to Staff analyzing the PacifiCorp proposal in Utah as well. (See below for discussion.)

Following the September 14th workshop, Oregon Commission Staff reviewed PacifiCorp's IRP in the light of this new claim of need. Commission Staff came to a definite conclusion reflected in final reply comments filed on October 10th: PacifiCorp's system is resource adequate for capacity, energy, and reliable transmission until 2028. Staff asserted that resources proposed by PacifiCorp are not needed now, and unless conditions change, will not be needed in part until 2028.

PacifiCorp Capacity Need Version 3: Approximately 200 MW by 2021.

The 174 MW of capacity need mentioned above was supplanted by a new number by the time PacifiCorp released its wind resource RFP. This RFP, issued on September 27, 2017, is for up to 1,270 MW of resources capable of interconnecting or delivering to PacifiCorp's Wyoming system, or "any additional wind energy located outside of Wyoming capable of delivering energy to PacifiCorp's transmission system that will reduce system costs and provide net benefits to customers."[46]

Instead of a 174 MW capacity contribution, 1,270 MW of wind would provide a 200 MW capacity contribution, at the 15.8 percent capacity contribution level used by PacifiCorp. By September 27, 2017, PacifiCorp's asserted Capacity need had changed from 395 MW in the summer of 2028, to 174 MW by 2021, to 200 MW by 2021.

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[44] LC 67 PacifiCorp Reply Comments at 22 (emphasis added).
[45] *See* page 16 of Staff's Final Comments.
[46] *See* PacifiCorp's RFP Announcement Web Portal: http://www.pacificorp.com/sup/rfps/2017-rfp.html.

PacifiCorp Capacity Need Version 4: Greater than 200 MW by 2021.

On September 19th, 2017, in the course of Rick Link's hearing appearance before the Utah Commission as part of Docket No. 17-035-23, the following testimony was offered:

> The company continues to oppose recommendations from parties to extend the 2017R RFP eligibility to solar or other resources, which would eliminate the time-limited opportunity and essentially jeopardize the opportunity that's in front of us today. *However, the company remains open to testing the market for additional solar resource opportunities as indicated in our comments in reply to the Utah IE report.* These opportunities we would pursue if they can deliver net benefits for customers, and that can be done in a separate process.[47]

At the same hearing, Charles Peterson took the stand for live surrebuttal before the State of Utah Public Service Commission, and testified:

> The division had understood, up to this morning at least, that the company was bringing forth this proposal, this RFP and related wind repowering and transmission proposal as strictly economic opportunities. *This morning was the first time that I'm aware that a company representative has said this it is to satisfy a need.*[48]

Accordingly, the understanding that PacifiCorp did not need new resources in 2020 for capacity was not unique to Oregon Staff. Many, if not most parties in this matter, were also similarly confused.

Ten days later, on September 29th, 2017, an article was published discussing PacifiCorp's recently released wind RFP, stating the following:

> The utility [PacifiCorp] also expects to release an RFP for solar project[s] in the next four to six weeks, a spokesman for the company told *Clearing Up*.[49]

PacifiCorp has confirmed that if solar resources are procured, they will be *in addition to* the proposed Wyoming wind and transmission resources.[50] This Solar RFP has been

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[47] *In the Matter of: In Re: RMP – RFP Solicitation Process for Wind Resources*; Hearing Transcript, Docket No. 17-035-23, September 19, 2017, p.56 (emphasis added).
[48] *In the Matter of: In Re: RMP – RFP Solicitation Process for Wind Resources*; Hearing Transcript, Docket No. 17-035-23, September 19, 2017, p.217.
[49] *Clearing Up*, September 29, 2017, No. 1819, p.9.
[50] Staff's Final Comments at 18.

released.[51] This undefined potential new solar resource increases the undefined capacity need to more than 200 MW. The Solar resource procured by PacifiCorp could be significant. PacifiCorp is seeking all economic projects; i.e., all projects producing net system benefits, up to 300MW *per individual* project.[52]

PacifiCorp Capacity Need Version 5: 1000 MW in 2019.

In PacifiCorp's reply comments, PacifiCorp sought to bolster its claim of a capacity need. PacifiCorp claims its capacity need is 1000 MW, in 2019.[53] PacifiCorp also claims that this capacity need grows and increases over the remaining course of the 20-year planning horizon by removing FOTs from the analysis.[54] This is the fifth different characterization of capacity need that has been presented by PacifiCorp in this proceeding.

PacifiCorp's Statements of Capacity Need: April to October 2017

Neither the size of the asserted capacity need, nor its timing has been consistent in this proceeding as is summarized in the following table:

As Of	Asserted Capacity Need	Date of Asserted Capacity Need
April, 2017	Approximately 395 MW	Summer, 2028
September 14, 2017	174 MW	By 2021
September 27, 2017	Approximately 200 MW	By 2021
September 29, 2017	Greater than 200 MW	By 2021
October 30, 2017	1000 MW	2019

Even after putting the question very plainly to PacifiCorp, Staff still does not know what PacifiCorp's capacity need is, and when it will emerge; or whether it is a near-term need or a long-term need. Although the latest assertion by PacifiCorp is that there is a capacity need of "approximately" 1,000 MW, emerging in 2019 and that new resources proposed by PacifiCorp would displace 174 MW or 200 MW or more of this capacity need starting in 2021, PacifiCorp has not explained why it is important to address 174 MW or 200MW or more of this need but not the remaining 826MW or 800MW or less. Moreover, PacifiCorp has not outlined the minimum amount of FOTs that it will or should rely on in 2019, 2020, 2021 or future years in the 20 year IRP period. An

[51] *See* http://www.pacificorp.com/sup/rfps/2017S-RFP.html.
[52] Id.
[53] LC 67, PacifiCorp's Response Comments at 8.
[54] Id.

acknowledged action plan to address a capacity need must include a detailed discussion of the timing and nature of that need, and why and how it has emerged.

Wind Repowering
Like the new wind and transmission projects, the proposed repowering project does not meet a capacity, energy, regulatory, or reliability need. Accordingly, Staff does not recommend acknowledgement of the wind repowering project for the same reasons described above in relation to the new wind and transmission projects. CUB argues that repowering is not new, and that hydro plants have been repowered to increase production. CUB states that "in such a case, the question of need rests with the original investment in the plant."[55] Staff finds this perspective on wind repowering to be interesting, but ultimately unpersuasive. In order of qualify for the appropriate tax treatment to generate PTCs, over 80 percent of the value of the repowered turbines must be newly installed. Such and investment is not analogous to the maintenance associated with periodically updating generating equipment at hydro facilities. Like the new wind and transmission projects, Staff recommends that if the Commission acknowledges these resources, it do so with the same economic opportunity conditions discussed below.

Transmission
The need for transmission associated with the new wind has not been established. Contrary to PacifiCorp's assertions, the fact that PacifiCorp has repeatedly admitted that it has no plans to pursue the proposed Wyoming transmission facilities without the construction of at least 1,100 MW of new Wyoming wind is a clear and unequivocal indication that the transmission segment is not needed from a reliability standpoint. PacifiCorp argues that the transmission segment will make the overall system more reliable. PacifiCorp has not presented evidence that the system needs the proposed transmission for reliability purposes. Here the question of "cause" is determinative. A new transmission proposal has a reliability or energy need cause. The cause in this case is new Wyoming Wind, and the cause for the new Wyoming Wind is economic opportunity; i.e., PTC capture. Because the transmission project will not be constructed independent of the Wind, it is not independently needed and should not be acknowledged.

NWEC asks the Commission to require a more extensive examination of transmission alternatives to the Aeolus to Bridger/Anticline investment. NWEC also supports PacifiCorp's additional solar RFP. These requests are reasonable in light of PacifiCorp's claim of overall capacity need. If capacity is needed on the system, then it stands to reason that the capacity could be acquired anywhere on the system.

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[55] Id.

Similarly, NIPPC's argument that PacifiCorp should not discriminate against other potentially lower cost generation types is entirely reasonable, if capacity is truly needed. If 1000 MW of capacity is needed in 2019, and that amount is anticipated to grow over time, the lowest cost new capacity should be acquired, regardless of the location. Accordingly, solutions should not be limited to Wyoming, if indeed capacity need is the driver of the resource acquisition decision-making.

PacifiCorp should demonstrate this capacity need and its explicit timing before the Commission acknowledges action to address it. This is difficult in this case for PacifiCorp, because the proposed resources represent an economic opportunity and not a need. In LC 67, PacifiCorp's "need" for Wyoming Wind and Transmission is caused by PTC availability.

Risks to Customers of the Present Projects

The risks to customers associated with PacifiCorp's wind repowering, new wind, and transmission projects are all the more significant because the resources are not needed. In its final comments, Staff provided a sample of project risks facing ratepayers, and demonstrated that small changes in modeling assumptions reduce or eliminate any expected benefits to customers. In its final reply comments, the Company wrote the following: "Staff does not justify this unbalanced treatment of the relative risks and benefits, and ignores that in the vast majority of scenarios customers substantially benefit."[56] PacifiCorp also provided a table demonstrating that small favorable changes in modelling assumptions lead to greater customer benefit.[57] Two points are notable regarding this.

First, in the framework of need-based planning, upside benefit potential is never considered. This is because when there is a reliability need, it is understood that customers will bear risk, but they will bear the least risk (and least cost) feasible to meet the identified need. The Company's assertion that upside benefit potential should be considered is not appropriate in the context of need-based planning; however, it is consistent with the examination of an economic opportunity.

Second, Staff provided a number of risks specific to a large development, ranging from the likely (i.e., construction cost overruns) to the improbable (i.e., production tax credits no longer increasing with inflation, and being frozen at $24/MWh going forward). Shortly after Staff's final comments, the majority leaders of the United States House of Representatives unveiled their proposed tax bill, which, among other things, proposes

[56] LC 67 PacifiCorp Response Comments, October 30, 2017, page 23.
[57] Id.

to cut the value of production tax credits to $15/MWh and freeze it there.[58] This change would impact any group of projects of the size the Company is interested in by hundreds of millions of dollars. It is further of note because far from being a risk that might precipitate far out in a wind project's 30-year life, this risk presented itself less than one month after Staff's final comments were filed.[59]

In its final reply comments, the Company states "Again, Staff assumes that action is necessarily riskier than inaction..."[60] The present proposed House tax bill is a timely example of why that is the case. There are any number of risks associated with major resource acquisition or development that can ultimately harm customers. Staff believes that the only way to completely mitigate project-based risks is to avoid the project entirely. While this is not a possible or reasonable course of action in the face of a resource need, it is when the proposed project is justified on the basis of economic opportunity.

Staff reiterates here and requests that the Commission consider the basic proposition Staff presented in final comments. *Where it is reasonable to put on the ratepayer all of the cost and risk associated with needed resources, it is not reasonable to do the same for economic opportunities that present considerable risk but are not needed.* Staff also notes again the following:

- Staff believes that the traditional IRP process is not designed to accommodate economic opportunity.
- Allowing acknowledgement of non-needed resources because they create a potential economic opportunity could set a precedent for an ever-increasing rate base, where new resource acquisitions are divorced from need.

While reviewing the reasonableness of a plan to acquire needed resources is fairly straightforward, reviewing the potential value of an economic opportunity is a much more difficult and complicated exercise in the context of an IRP, and is unprecedented. Staff recommends that if the Commission wishes to consider acknowledgement of the Energy Vision 2020 resource acquisitions, it do so in a way that protects ratepayers in the context of an economic opportunity. Accordingly, Staff recommends the following:

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[58] https://www.bloomberg.com/news/articles/2017-11-02/house-tax-bill-trims-wind-tax-credit-extends-nuclear-provision

[59] "House Tax Proposal Unsettles the US Wind Industry," November 6, 2017, https://www.greentechmedia.com/articles/read/house-tax-proposal-unsettles-the-us-wind-industry#gs.HdLOwUg

[60] See LC 67 PacifiCorp Response Comments, October 30, 2017, page 23.

- Any acknowledgement of an economic opportunity resource acquisition should be made in the context of a wholesale review of other economic opportunities, including a greater reliance on distributed generation and third-party resource providers.
- An economic opportunity review should examine potential retirement of older existing resources that are poor performers economically or are subject to risks associated with emissions or environmental impacts.
- Economic opportunities tied to regulatory compliance, such as the acquisition of renewable resources, or a longer term decarbonization strategy, should be tied to a plan for procurement.[61]
- Most importantly, acknowledged economic opportunities should make clear to the Company the Commission's intent to mitigate ratepayer risks. Below, Staff recommends protections that would act to insulate ratepayers from the risks associated with economic opportunity investments. It is essential that specific identified risks, such as the realization of PTCs associated with the project, are not borne by ratepayers but instead by shareholders.

Staff believes these conditions level the playing field between ratepayers and shareholders by asking PacifiCorp to stand behind the economic opportunity analysis it has presented. Many parties in this proceeding agree with Staff's request for ratepayer protections.

Staff emphasizes the fact that the review suggested here might be narrowly, or expansively, applied in the future. For instance, it is possible that economic opportunity resource developments are destined to be limited, and tied to the PTC sunset. In contrast, this analysis might be extensively applied in the future in the context of decarbonization. As discussed in detail in Staff's final comments, the emphasis on decarbonization could present a continual review of existing and potential resources and technologies that do not fit neatly into the IRP's historic need-centered process. Finally, Staff notes that because PacifiCorp presented this economic opportunity at the eleventh hour of this IRP process, as detailed above, it may not be possible to incorporate all of Staff's recommendations into the analysis of the current proposed process. Accordingly, if not adopted now, Staff recommends the guidelines be required in the very near term, well before PacifiCorp begins its IRP update process.

CUB's recommendation of an "alternative form of regulation" for economic investments is similar to Staff's suggested ratepayer protections for capital expenditures made

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[61] *See* LC 66 Order 17-386, p.15-16.

based primarily on economic opportunity. Both proposals seek to correct the imbalance associated with ratepayer guarantee of recovery of costs and rates of return where resources are not needed for capacity, energy, regulatory or reliability purposes. ICNU supports a rate recovery analysis. ODOE supports cost containment. Renewable Northwest also mentions the "AFOR" concept examined by CUB as an alternative; Renewable Northwest recommends acknowledgement. Renewable Northwest references Order No. 98-191, an offering to the Company which created a revenue cap for PacifiCorp on certain distribution investments, while allowing revenue sharing between customers and the company outside of a certain range.[62]

Staff also notes other actions that would mitigate risk and lower costs for customers in the context of a non-needed economic opportunity. Below are two components that could be included in PacifiCorp's near-term action plan that would help mitigate risks.

- Wind Development through Long-term PPAs: Many (though not all) of the risks outlined by Staff in final reply comments are associated with resource ownership. Long-term PPAs that span the Company's modeling analysis (i.e., that extend to 30 years or beyond) are not subject to many of these risks. Long-term PPAs that have a benefit equal to or greater than any proposed benchmark resource acquisition should be considered first.
- Early retirement of facilities modeled to be uneconomic: As discussed by Staff and other parties, the early retirement of existing PacifiCorp facilities could justifiably build "need" back into the analysis, and might produce more favorable economics for customers and the Company than presented by PacifiCorp. If accelerating proposed retirements into the near-term action period acts to support tangible need and improve system economics near-term retirements should be actively considered.

FOT Treatment in the Future

Given the lack of clarity in this docket on the status of FOTs as a system resource that can be relied upon to meet capacity needs, Staff believes it would be optimal to explicitly define "resource need" as "post-FOT residual resource need." Barring that, the Company should provide an explicit capacity need analysis. The Commission and stakeholders cannot effectively review a capacity need if it is not clearly expressed by PacifiCorp. That capacity need analysis must outline how much supply can or should be met through front office transactions. Assuming that PacifiCorp intends to acquire some minimum level of FOTs on a going forward basis, PacifiCorp must outline the

[62] *See* Order 98-191 at 1-2.

level of FOTs that it intends to acquire, and indicate why that level is appropriate as opposed to alternatives.

Further, if PacifiCorp intends to count FOTs in its capacity analysis, then PacifiCorp does not have a capacity need until 2028 and hence the Energy Vision Resources are what Staff suggests, pure economic opportunities. If PacifiCorp wants to pull FOTs out of its capacity analysis, then PacifiCorp must present a plan to acquire *all* needed capacity; presumably 1000 MW by 2019 and PacifiCorp must explain why it is inappropriate to rely on FOTs for capacity. If PacifiCorp wants to use some, but not all available FOTs to meet capacity needs, it must describe where and how the Company intends to draw the line between what new resources are needed and what capacity should be met with FOTs. PacifiCorp must explain what the factors are in drawing that line.

Finally, Staff notes that PacifiCorp's claims in this docket that FOTs cannot or should not be counted when examining capacity need has important implications for PURPA filings. If PacifiCorp's asserted capacity need date is 2019, then PacifiCorp's avoided cost filings must reflect this asserted need. Staff recommends that the Commission request clear and consistent deficiency dates from PacifiCorp that accurately incorporate PacifiCorp's asserted 2019 need for capacity, and its asserted 2025 need for renewable resources referenced in response comments.[63]

Alternative Actions to Non-Acknowledgement of Resource Acquisitions: Recommend for Potential Acknowledgement of PacifiCorp's Resource Acquisitions (Action Items 1a, 1b, 2a)

Should the Commission choose to consider conditional acknowledgement based on a finding that PacifiCorp's major resource acquisitions represent a low-cost opportunity, Staff proposes that the Commission signal to the Company the consumer protections it anticipates imposing in the appropriate ratemaking proceeding.

The protections we contemplate fall generally into two time periods: pre-COD and post-COD. In the pre-COD phase, the construction phase, the ratepayer protection would be to set a construction-cost cap. Given that the Company will be provided or will be able to produce detailed construction cost and purchase cost figures associated with some level of all-in economic benefit to its customers, the Commission could convey to the Company that any costs in excess of those the Company indicates customers could economically incur will be presumed imprudent.

[63] LC 67, PacifiCorp's Response Comments at 28.

For the post-COD period, the second ratepayer protection would be to ensure that from the customers' perspective, project revenue is at least as favorable as modeled. For the modeled revenue to be realized over the 20 to 30 years for each project or PPA, several assumptions must hold. Realized spot prices must be as high as modeled forward prices. Both the modeled capacity factor and the units' availability rates must be met. Instead of attempting to create protections for each of these individual assumptions, Staff proposes creating a protection related to revenue directly.

The Company will determine what 30 year revenue stream generated by the assumptions of its models leads to all-in economic benefits to its customers. This revenue stream includes—but is not limited to—the value of both the energy expected to be generated and the anticipated value of the associated production tax credits (PTCs). The Company could then be held to these assumptions for ratemaking purposes. Staff proposes that if actual revenues do not materialize as favorably as the model expected, it is the *modeled* revenues that are used in the Company's net power cost calculation. This will ensure that at minimum, the anticipated revenue stream benefits the customers were described are actually realized.

Importantly, Staff's alternative proposal should not be construed as a new risk/reward sharing mechanism where customers are protected from some risks in exchange for additional upside shareholder benefits above a certain threshold. For a utility owned and rate-based resource, the return on investment is the shareholders' upside. The ratepayer protections in Staff's alternative recommendation, however, are necessary because the utility is pursuing a potential economic opportunity well in advance of need and with additional temporal risk that is not already incorporated in the rate-base formula.

Accordingly, the Commission should indicate its intent to mitigate those risks at the time the decision is made to include the resource in rates. In other words, Staff recommends that the Commission indicate that significant risk to ratepayers inherent in an economic opportunity not based on need is presumed imprudent and should be removed or mitigated as part of the process to determine prudence. For a PPA wind resource, the ratepayers should bear the costs and receive benefits equal to or better than the company's net present value analysis. Whether the generation resource is owned or contracted for, Staff's protections should apply to the owned transmission assets that underlie either type of investment.

To be clear, however, Staff acknowledges that the Commission is unable to adopt ratemaking conditions in this proceeding. As such, Staff recommends that the Commission note in any order approving the Company's Action Items what it intends to consider in the ratemaking proceeding in which cost-recovery is sought.

Staff Recommendation

Recommendation regarding PacifiCorp's Resource Acquisitions
Staff recommends that the Commission not acknowledge PacifiCorp Action Items 1a, 1b, and 2a; the plan to repower existing wind resources, the acquisition of at least 1,100 MW of new Wyoming wind resources to capture PTC benefits, and a 140-mile transmission line (and associated lines) associated with the new wind infrastructure.

Potential Framework for Consideration of non-need based Action Items as part of the IRP Process, Should the Commission Reject Staff's Recommendation to not Acknowledge Action Items 1a, 1b, and 2a.

The Commission can provide guidance about how it intends to evaluate PacifiCorp's resource acquisition decisions justified by economic opportunity in either acknowledging or not acknowledging them in the IRP process.

Staff would recommend that the Commission make clear that any economic opportunity acknowledged as part of the IRP process would be subject to strong protections that hold ratepayers harmless for the unnecessary risk and potential cost of the economic opportunity in a subsequent ratemaking proceeding.

The protections we contemplate can be thought of as falling into two time periods: pre-COD and post-COD. We propose the Commission indicate in its order that it intends to consider the following ratepayer protections when a prudence determination and rate recovery are sought:

1. <u>Pre-COD</u>
In the pre-COD phase-the construction phase-the ratepayer protection is simply to set a construction-cost cap. Given that the Company will be provided or will be able to produce detailed construction cost or purchase cost figures associated with some level of all-in economic benefit to its customers, the Commission could convey to the Company that any costs in excess of those the Company indicates customers could economically incur would likely be presumed imprudent.

2. <u>Post-COD</u>
The second protection, for the post-COD period, would ensure that from customers' perspective, project revenue is at least as favorable as modeled. For the modeled revenue to be realized over thirty years for each project, several assumptions must hold. Realized spot prices must be as high as modeled forward prices. Both the modeled capacity factor and the units' availability rates must be met. Instead of

attempting to create protections for each of these individual assumptions, Staff proposes the Commission discuss creating a protection related to revenue directly.

Specifically, Staff proposes that if actual revenues do not materialize as favorably as the model expected, the Commission indicate that it intends to use the *modeled* revenues in the Company's net power cost calculation over the 30+ year revenue stream modeled by the Company. This will ensure that the anticipated revenue stream benefits the customers were described actually are realized.

Staff's General Framework for Review of All Potential Economic Opportunities and Economic Retirements

If economic opportunities are under consideration in the IRP process, then the Commission should make clear that all potential economic opportunities should be explored.

A comprehensive review of all opportunities, including those that may not be advantageous to the electric company's shareholders, such as a greater reliance on distributed generation or third parties as resource providers, should be completed. In order to complete this review and make a recommendation to the Commission, Staff and stakeholders must have greater access to relevant data, models, and alternatives because existing resources need to be reviewed in detail by all stakeholders to appropriately identify economically viable alternatives. This review must examine resource retirements. If retirements are potentially economic, then they must be considered alongside the preferred economic opportunity. Failing to review these retirements could result in unnecessarily higher costs for customers.

Staff further recommends that time be taken to gather stakeholder input on additional requirements for IRP filings that would support a balanced examination of economic opportunities.

1c <u>Renewable Portfolio Standard Compliance</u>

PacifiCorp plans to:

- PacifiCorp will issue unbundled REC request for proposals (RFP) to meet its state RPS compliance requirements.
  – As needed, issue RFPs seeking then-current-year or forward-year vintage unbundled RECs that will qualify in meeting California renewable portfolio standard targets through 2020.

  – As needed, issue RFPs seeking low-cost then-current-year, forward-year, or older vintage unbundled RECs that will qualify in meeting Oregon renewable

portfolio standard targets, deferring the currently projected 2035 initial shortfall after accounting for preferred portfolio renewable resources.

Staff notes that this Action Item is consistent with PacifiCorp's most recent Renewable Portfolio Implementation Plan (RPIP).

Staff Recommendation

Recommendation regarding Renewable Portfolio Standard Compliance
Staff recommends that the Commission acknowledge PacifiCorp Action Item 1c; PacifiCorp will issue unbundled REC request for proposals (RFP) to meet its state RPS compliance requirements.

1d <u>Renewable Energy Credit Optimization</u>

PacifiCorp plans to:

- Before filing the 2017 IRP Update, evaluate potential opportunities to re-allocate RECs from Utah, Wyoming, and Idaho to Oregon, Washington, or California.
- Maximize the sale of RECs that are not required to meet state RPS compliance obligations.

Staff Recommendation

Recommendation regarding Renewable Energy Credit Optimization
Staff recommends that the Commission acknowledge PacifiCorp Action Item 1d; Update, evaluate potential opportunities to re-allocate RECs from Utah, Wyoming, and Idaho to Oregon, Washington, or California, and maximize the sale of RECs that are not required to meet state RPS compliance obligations, before filing the 2017 IRP Update.

TRANSMISSION

2a <u>Aeolus to Bridger/Anticline</u>

PacifiCorp plans to:

By December 31, 2020, PacifiCorp will build the 140-mile, 500 kV transmission line running from the Aeolus substation near Medicine Bow, Wyoming, to the Jim Bridger power plant (a sub-segment of the Energy Gateway West transmission project). This includes pursuing regulatory review and approval as necessary.

– June-July 2017, file a CPCN application with the Public Service Commission of Wyoming.

– By March 2018, receive conditional CPCN approval from the Wyoming Public Service Commission pending acquisition of rights of way.

– By December 2018, obtain Wyoming Industrial Siting permit and issue EPC limited notice to proceed.
– By April 2019, issue EPC final notice to proceed.
– Complete construction of the transmission line by December 31, 2020.

Staff discusses PacifiCorp's Acton Item 2a at length in the "Renewable Action Items" section of this report. Action Item 1b proposing new wind and Action Item 2a proposing new transmission are tied together in PacifiCorp's 2017 IRP.

Staff Recommendation

Recommendation regarding Aeolus to Bridger/Anticline Project.
Staff recommends that the Commission not acknowledge PacifiCorp Action Item 2a; 140-mile transmission line (and associated lines) associated with the new wind infrastructure.

2b <u>Energy Gateway Permitting</u>

PacifiCorp plans to:

Continue permitting for the Energy Gateway transmission plan, with the following near-term targets:

– For Segments D1, D3, E, and F, continue funding of the required federal agency permitting environmental consultant actions required as part of the federal permits.
– For Segments D, E, and F, continue to support the projects by providing information and participating in public outreach.
– For Segment H (Boardman to Hemingway), continue to support the project under the conditions of the Boardman to Hemingway Transmission Project Joint Permit Funding Agreement.

Staff Recommendation

Recommendation regarding Energy Gateway Permitting
Staff recommends that the Commission acknowledge PacifiCorp Action Item 2b; the continuation of permitting for the Energy Gateway transmission plan.

2c <u>Wallula to McNary 230 kV Transmission Line</u>

PacifiCorp plans to:

Complete Wallula to McNary project construction per plan with a 2018 expected in-service date. Continue to support the permitting and construction process for Walla Walla to McNary.

Staff Recommendation

Recommendation regarding Wallula to McNary 230 kV Transmission Line
Staff recommends that the Commission acknowledge PacifiCorp Action Item 2c; the completion of Wallula to McNary project construction per plan with a 2018 expected in-service date.

2d Planning Studies

PacifiCorp plans to:

- Complete planning studies that include proposed coal unit retirement assumptions from the 2017 IRP preferred portfolio and two other scenarios.
- Summarize studies in the 2017 IRP Update.

Staff Recommendation

Recommendation regarding Planning Studies
Staff recommends that the Commission acknowledge PacifiCorp Action Item 2d; the completion of planning studies that include proposed coal unit retirement assumptions from the 2017 IRP preferred portfolio and two other scenarios to be summarized in the 2017 IRP Update.

Firm Market Purchase Actions

Action Item 3a in the 2017 IRP states with regards to Front Office Transactions (FOTs) that PAC will:

> *Acquire economic short-term firm market purchases for on-peak summer deliveries from 2017 through 2019 consistent with the Risk Management Policy and Commercial and Trading Front Office Procedures and Practices. These short-term firm market purchases will be acquired through multiple means:*
>
> - *Balance of month and day-ahead brokered transactions in which the broker provides the service of providing a competitive price.*
> - *Balance of month, day-ahead, and hour-ahead transactions executed through an exchange, such as Intercontinental Exchange (ICE), in which the exchange provides the service of providing a competitive price.*
> - *Prompt month-forward, balance-of-month, day-ahead, and hour-ahead non-brokered transactions.* [64]

[64] *See* LC 67 Initial Filing, Executive Summary, p. 41, April 4, 2017.

This text above is almost verbatim with the FOT Action Item from the 2015 IRP, which was recommended for approval by Staff and acknowledged by the Commission.[65, 66, 67]

Staff finds that, in the abstract, the proposed language of PAC's FOT Action Item remains both applicable and relevant to the 2017 IRP. However, as discussed in detail above, Staff is concerned about how PAC will implement this Action Item based on PAC's revised thinking about the role of FOT's in filling the Company's future capacity/energy.

FOTs were an integral part of PAC's Least-Cost/Least-Risk Plan until the fall of 2017.

The Company's changing relationship to FOTs in LC 67 seems to be less founded on new cost and/or risk data discovered during the IRP but on an evolving approach of toward "need."

At the beginning of the IRP process the Company projected utilizing between 1,575 MW of FOT in the summer and 412 FOT in the winter and the Company's residual capacity need in 2028 would be 395 MW. [68]

At the initial Public Meeting to present the IRP Action Plan the Company stated the following about FOTs,

> *"FOT's continue to play a role in our IRP…We are very comfortable with our ability to procure this level (2017 IRP) of FOTs and [the level of wholesale power market purchases in the IRP] is conservative relative to the types of purchases we've been able to historically make on our system and that are cost-effective for our customers in terms of managing our power costs and overall portfolio. We know that there is some uncertainty as we get further out in time with regional coal unit retirements and things of that nature. But we've done some assessment of that in our 2017 IRP and still feel comfortable with the assumptions we are making [in this IRP about the level of FOT's]."*[69]

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[65] *See* LC 62 Initial Filing, Executive Summary, p. 11, March 31, 2015.
[66] *See* LC 62, Staff's Acknowledgement Memo, p. 6, December 3, 2015.
[67] *See* LC 62, Order No. 16-071, Commissioner Acknowledgement, p. 4, February 29, 2016. Conditions were: the company provide justification for future trading hub liquidity and urged PAC to address concerns about reliance on FOTs in a market reliance risk analysis. This was completed for the 2017 IRP. At September 22, 2016 PAC noted that its study of issue found no reason to change its FOT assumptions for the 2017 IRP, *see* PAC IRP Workshop 9/22/17, PowerPoint, p. 33.
[68] *See* LC 67 Initial Filing, Modeling Results, p. 257, April 4, 2017.
[69] *See* PAC IRP Workshop, 5/30/17, PowerPoint, p. 6, at 1:20:00 in the presentation.

In fact, the Company found that based on a market study and a risk analysis investigating PAC's possible over reliance on FOTs, there was no need to change any of the assumptions about the use of FOTs between the 2015 and 2017 IRP.[70]

But by the fall of 2017, PAC's Energy Vision 2020 asserted that FOTs no longer represented a least-cost/least-risk option for Ratepayers. Specifically,

> *Energy Vision 2020 projects are a necessary part of PacifiCorp's least-cost, least-risk plan because they will fill an energy and capacity need by displacing front office transactions (FOTs)...*[71]

In less than six months from filing the IRP, FOTs became a high-cost transaction to be replaced and contribute to 1,000 MW capacity need beginning in 2019.[72]

FOTs have historically been an integral part of past IRP resource portfolios
Staff reviewed past IRP filings and found that FOTs have been a foundational elements to recent past IRPs and used as a valuable tool in PAC's resource planning. Most recently, FOTs have been a way to help PAC balance load and act as a least-cost / least-risk tool to adjust to changes in the Company's resource mix:

> *As compared to the 2015 IRP Preferred Portfolio, changes in the resource mix for the 2016-2025 planning period reflect those needed to meet capacity needs associated with the assumed early retirement of Naughton Unit 3 and Cholla Unit 4. As was the case in the 2015 IRP Preferred Portfolio, PacifiCorp continues to plan to meet its customers' needs largely through the acquisition of cost-effective energy efficiency (Class 2 Demand Side Management) resources and FOTs over the next ten years.*[73]

In fact FOTs have generally represented 4 to 8 percent of the capacity of recent filed preferred portfolios.

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[70] *See* PAC IRP Workshop, 9/22/17, PowerPoint, p. 33.
[71] *See* PAC IRP Reply Comments, p. 7, 10/30/17.
[72] LC 67 PacifiCorp's Response Comments, p.2.
[73] *See* PAC IRP 2015 UPDATE, Executive Summary, March 31, 2016, p. 31.

IRP Year	MW of FOT in Preferred Portfolio, Year of Filing
2013	650 [74]
2015	727 [75]
2017	781[76]

Staff finds the Energy Vision 2020 pivots away from FOTs towards the acquisition of new resources. A break from past resource planning logic and more data between now and the IRP update would be necessary to better understand this very recent important development.

Staff Recommendation

Recommendation regarding Front Office Transactions

Staff recommends acknowledging Action Item 3a with the following conditions:

- PAC must report back in its 2017 IRP update as to the current and forecasted use of FOT's through 2036 and any changes in assumptions impacting FOT use from the initial filing of LC 67 in April 2017.

- PAC should repeat its study of trading hub liquidity and also the market reliance risk analysis of FOTs prior to the next IRP. The market reliance risk should include a comparison of the trade-offs between FOTs and energy services acquisition through PPAs or RFPs.

Energy Efficiency/Class 2 DSM

Overview

PAC's Action Item 4a for Demand Side Management requests Commission Acknowledgement of the following:

Acquire cost-effective Class 2 DSM (energy efficiency) resources targeting annual system energy and capacity selections from the preferred portfolio as summarized in the following table. PacifiCorp's state-specific processes for planning for DSM acquisitions is provided in Appendix D in Volume II of the 2017 IRP.

[74] *See* PAC IRP 2013, LC 57, Initial Filing, April 30, 2013, p. 11.
[75] *See* PAC IRP 2015, LC 62, Initial Filing, March 31, 2015, p. 196.
[76] *See* PAC IRP 2017, LC 67, Initial Filing, April 4, 2017, p. 234.

Year	Annual Incremental Energy (GWh)	Annual Incremental Capacity* (MW)
2017	646	154
2018	559	128
2019	571	131
2020	527	122

*Class 2 DSM capacity figures reflect projected maximum annual hourly.

Parties' Positions

NWEC
NWEC provided the following summary of recommendations in its comments, filed on October 30, 2017:

> Not acknowledging Action Plan Item 4a for energy efficiency until the Company revises and improves its methodology for evaluating Class 2 DSM in its IRP in a manner that ensures identification of all cost effective conservation throughout its system.
>
> Additionally, encourage staff and the Commission to provide recommendations or a proposed action item that encourages more aggressive action by the Company in pursuing demand response resources (Class 1 DSM).[77]

PAC
PacifiCorp indicates that Staff's assertions in Final Comments regarding PacifiCorp Action Plan Item 4a for energy efficiency acknowledgement subject to modifications would be redundant and duplicative.[78] The Company states that it is currently working on the better aligning energy efficiency forecasts with the Energy Trust of Oregon (Energy Trust), other utilities, and stakeholders. As to the potentially unequal level of savings by region across the Company's territory, PAC notes that they already retains the services of an independent consultant to examine the second item routinely and should be sufficient to address Staff's concerns.[79]

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[77] LC 67 NW Energy Coalition Comments on Staff Final Comments PAC IRP p.3.
[78] "Staff believes PacifiCorp Action Plan Item 4a for energy efficiency should be acknowledged, subject to modifications because Staff believes PacifiCorp needs to address two issues: (1) Staff's belief that there is an ongoing tendency to underrepresent energy efficiency as a resource; and (2) Staff's statement that the reduction of total system energy efficiency between the 2015 IRP and the 2017 IRP could be perceived as unfair to Oregon customers when comparing savings between Oregon and Utah."
[79] *See* PAC IRP Reply Comments, October 30, 2017, p. 40.

Staff
In Staff's October comments on the IRP, Staff noted two overall issues with PAC's energy efficiency forecasting and overall levels of acquisition across the Company's varied territory. First, PAC's IRP forecast for energy efficiency has consistently been less than Energy Trust's forecast.[80] Second, Staff noted some potential issues regarding the levels of forecasted savings across states. Staff contemplated whether an independent investigation comparing the methodologies used to determine energy efficiency potential across state would help to better identify and resolve any issues. Staff recommended acknowledging item 4a in its Reply Comments, but with two modifications. Both modifications called for PAC to hire independent consultants to (a) conduct an analysis to identify the ongoing differences between the Company's and Energy Trust's energy efficiency forecasts, and (b) identify and compare any differences in methodology that would lead to differences in energy efficiency forecasts across states.

Staff Recommendation
Staff appreciates the work by stakeholders and PAC's thorough response in its October Reply Comments. The Company's rebuttal of Staff's assertion for independent consultants to explore issues related to Oregon forecasts and cross-state forecasts were compelling, but fell short for Staff.

With regard to better aligning the Company's forecast with Energy Trust forecasts, the workshops conducted by Energy Trust will not identify shortcomings in PAC's modeling software, just Energy Trust's. Staff believes an independent comparison would be helpful to PAC and benefit ratepayers. PAC's assertion of what may be driving the difference between the Company's IRP forecast for energy efficiency and Energy Trust's forecast, while theoretically possible, are in practice red herrings.

The current differential between avoided costs across utility territories is not sufficient enough so that the blended energy efficiency avoided cost rate used by Energy Trust would literally drive millions of kilowatt hours of saving differences annually. The same goes for exceptions, which amount to less than 2.5 percent of Energy Trust's annual savings. Staff still feels that collaboratively hiring a consultant to provide an independent assessment would be helpful to all parties involved.

With regard to a cross-state comparison of potential energy efficiency savings, Staff agrees that PAC's IRP process to develop energy efficiency forecasts by states is thorough. However, Staff still finds that PAC's process does not make clear the key drivers behind the differences in potential, technical, and achievable energy efficiency

[80] To this end Energy Trust's actual ACHIEVED savings over the past, several years have proven to be higher than both PAC's **and** Energy Trust's own forecasts.

levels across states. Staff lacks the insight and/or data to dismiss concerns that Oregon ratepayers shoulder a greater percent of energy efficiency savings burden across all states in PAC's territory. However, based on PAC's persuasive response, Staff finds that hiring an independent consultant may not be necessary at this time. But a thorough explanation may be necessary for all stakeholders. To this end, Staff recommends that PAC host a series of workshops for all of its utility commissions to better explain how its model develops avoided costs, conducts cost-effectiveness analysis and is applies this data to market information to develop potential, technical, and achievable EE savings forecasts across all states in PAC's territory

Staff Recommendation

Recommendations regarding Energy Efficiency/Class 2 DSM
Staff concludes that PAC's Action Plan Item 4a for energy efficiency (EE or Class 2 DSM) should be acknowledged subject to the following modifications:

- Hire and independent consultant, in coordination with Staff and Energy Trust, to conduct an analysis by the next IRP that identifies and compares the ongoing differences between Energy Trust and PacifiCorp's near- to long-term EE forecasts with Energy Trust actual achieved savings. The report should make recommendations to both organizations for forecasting improvements to adopt by the next IRP.

- Work with utility commissions across its entire service territory to scope and conduct a series of PAC led workshops explaining how the Company models potential, technical and achievable energy efficiency for its IRP forecasts.

Coal Resource Actions

Overview
In PAC's 2017 Action Plan, Action Items 5a – 5h, the Company requests Commission Acknowledgement of the following:

5a: **Hunter Units 1 and 2**
The EPA's final Regional Haze Federal Implementation Plan (FIP) for Utah requires the installation of selective catalytic reduction (SCR) on Hunter Units 1 and 2 in 2021 and is currently under appeal by the State of Utah and other parties in the U.S. Tenth Circuit Court of Appeals.

As influenced by the litigation schedule and outcomes, PacifiCorp will update its economic analysis of alternative Regional Haze compliance strategies for the units, as applicable, and will provide the associated analysis in a future IRP or IRP Update.

5b: **Huntington Units 1 and 2**
The EPA's final Regional Haze FIP for Utah requires the installation of SCR on Huntington Units 1 and 2 in 2021 and is currently under appeal by the State of Utah and other parties in the U.S. Tenth Circuit Court of Appeals.

As influenced by the litigation schedule and outcomes, PacifiCorp will update its economic analysis of alternative Regional Haze compliance strategies for the units, as applicable, and will provide the associated analysis in a future IRP or IRP Update.

5c: **Dave Johnston Unit 3**
The EPA's final Regional Haze FIP requires the installation of SCR at Dave Johnston Unit 3 in 2019 or a commitment to shut down Dave Johnston Unit 3 by the end of 2027. PacifiCorp's commitment to the latter must be included in a permit before the 2019 compliance deadline.

PacifiCorp will update its analysis of the commitment to shut down Dave Johnston Unit 3 by the end of 2027 as part of its 2017 IRP Update.

5d: **Jim Bridger Units 1 and 2**
The Wyoming Regional Haze State Implementation Plan (SIP) and EPA's final Regional Haze FIP for Wyoming require the installation of SCR on Jim Bridger Units 1 and 2 in 2021 and 2022.

PacifiCorp will update its economic analysis of alternative Regional Haze compliance strategies for the units and will provide the associated analysis in its 2017 IRP Update.

5e: **Naughton Unit 3**
PacifiCorp will update its economic analysis of natural gas conversion in its 2017 IRP Update.

5f: **Wyodak**
PacifiCorp will continue to pursue its appeal of the portion of EPA's final Regional Haze FIP that requires the installation of SCR at Wyodak, recognizing that the compliance deadline for SCR under the FIP is currently stayed by the court.

If, following appeal, EPA's final FIP as it pertains to installation of SCR at Wyodak is upheld (with a modified schedule that reflects the final stay duration), PacifiCorp will

update its evaluation of alternative compliance strategies that will meet Regional Haze compliance obligations and provide the associated analysis in a future IRP or IRP Update.

5g: **Cholla Unit 4**
EPA has approved the Arizona SIP incorporating an alternative Regional Haze compliance approach that avoids installation of SCR with a commitment to cease operating Cholla Unit 4 as a coal-fueled resource by the end of April 2025, with the option of natural gas conversion thereafter.

PacifiCorp will update its evaluation of Cholla Unit 4 alternatives that meet its Regional Haze compliance obligations and provide the associated analysis in a future IRP or IRP Update.

5h: **Craig Unit 1**
EPA has yet to approve the Colorado SIP incorporating an alternative Regional Haze compliance approach that avoids installation of SCR with a commitment to cease operating Craig Unit 1 as a coal-fueled resource by the end of 2025, with an option for natural gas conversion.

PacifiCorp will update its evaluation of Craig Unit 1 alternatives that meet its Regional Haze compliance obligations and provide the associated analysis in a future IRP or IRP Update, as required.

Parties' Positions

Sierra Club
Sierra Club reiterates the importance of examining the economics of PacifiCorp's existing coal fleet, notes that a number of parties—including Staff—have requested or are interested in this analysis, and refutes PacifiCorp's arguments to delay. It describes the first step in the analysis, which it asserts is more straightforward and faster to complete than PacifiCorp indicates. It then enumerates a number of other fleet questions that could be subsequently addressed.

CUB
CUB supports the proposals by Staff and Sierra Club to require PacifiCorp to conduct an analysis of the economics of coal unit retirements.

ODOE
ODOE indicated in its comments that it supported Staff and other parties' recommendations regarding PAC's Coal Resource Actions. ODOE stated that

additional coal analysis completed by PAC would facilitate parties' better understanding potential paths forward to decarbonization of the Company's resource mix and in identifying temporal opportunities to tap into available transmission capacity.

ODOE recommended that in addition to Staff's recommendation that PacifiCorp be required to:

1. Perform 25 SO runs – one for each coal unit and a 'base case.'
2. Provide the results of the SO runs to parties in LC 67 by March 30, 2018.
    a. Also, provide an itemized list of coal unit retirement cost assumptions used in each SO run by the same date.
3. Provide a list of coal units that would free up transmission along the path from the proposed Wyoming wind project if retired, also by March 30, 2018.
4. Summarize the results in PacifiCorp's final comments, providing a table of the difference in PVRR resulting from the early retirement of each unit.

ODOE also requested that the Company should also be required to quantify the system-wide carbon emissions to facilitate decarbonization, and meeting state climate goals, for each of the 25 SO runs.

ODOE discusses decarbonization planning and efforts in California and Colorado in its comments. ODOE recommends that Staff consider efforts in other states and work towards incorporating a similar type of GHG emissions planning into integrated resource planning.

Renewable Northwest
Renewable Northwest states:

> PacifiCorp's current RFP presents an opportunity for the Company to re-evaluate the economics of its coal fleet and address stakeholder concerns. If time and resources permit, PacifiCorp could run its models with project data from the RFP initial shortlist to see if there is any effect on the replacement or retirement of its coal fleet. Any information, even if only indicative, would be valuable to stakeholders and the Commission.[81]

NWEC
NWEC provided the following summary of recommendations in its comments, filed on October 30, 2017:

[81] LC 67 Renewable Northwest's Comments on Staff's Recommendations, p.11.

> Acknowledge the proposal for more comprehensive studies of coal fleet phase-out (Action Plan item 2c). However, NWEC encourages the Commission to provide guidance toward broadening this assessment to provide the foundation of a new clean energy and decarbonization strategy, not merely the retirement of individual units, following the "glide path" approach pioneered by the Commission in its PGE IRP acknowledgment (Order 17-386).[82]

PAC

In its final comments, PAC states:

> PacifiCorp is willing to perform the additional SO model runs requested by Staff. PacifiCorp estimates it can produce these 25 runs by June 2018, which aligns with the beginning of the stakeholder process for the 2019 IRP. This will also allow the new analysis to inform subsequent analysis in the 2019 IRP by providing coal-unit screening studies early in the public-input process. The requested SO model runs will require further supplemental analysis regarding transmission and system balancing, based on the identification of any economic retirement, or a combination thereof, that may occur.[83]

Staff

Staff believes early coal retirement or changes to coal plant operations are valid resource choices that should be considered as part of the least-cost, least-risk plan to meet system needs. Additional analysis of coal unit economics in PacifiCorp's IRP would provide transparency for stakeholders and could help further optimize PacifiCorp's system costs. As mentioned in Sierra Club's comments, PacifiCorp's 2017 IRP allows economic coal unit retirements in only one out of seven Regional Haze compliance scenarios, and then only for a limited number of coal units. PacifiCorp should assess the economics of its coal units to demonstrate whether keeping them online is truly part of an optimal least cost, least risk portfolio.

Staff believes March is a reasonable time-frame in which to complete this analysis. In the course of discovery, Staff requested this information earlier in the year. PacifiCorp chose not to provide it, or to even begin the analysis. The Company is entirely capable of completing this analysis by the March deadline requested by Staff. Staff does not recommend any Stakeholder workshops prior to the completion of this analysis. The request for this analysis has been discussed in detail in this proceeding, and Staff sees

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[82] LC 67 NW Energy Coalition Comments on Staff Final Comments PAC IRP, p.3.
[83] PacifiCorp reply comments, p. 4.

no value in further conversation which would only serve to delay the completion of the analysis.

Staff Recommendation

Recommendation regarding Coal Resource Action
In summary, Staff recommends that PacifiCorp should:

1. Perform 25 SO runs – one for each coal unit and a 'base case.

2. Provide the results of the SO runs to parties in LC 67 by March 30, 2018.
   a. Also provide an itemized list of coal unit retirement cost assumptions used in each SO run by the same date.

3. Provide a list of coal units that would free up transmission along the path from the proposed Wyoming wind project if retired, also by March 30, 2018.

4. Summarize the results in PacifiCorp's final comments, providing a table of the difference in PVRR resulting from the early retirement of each unit.

General IRP Comments

Load Forecasting and Load and Resource Balance

Overview
PAC finds a positive relationship between employment and the quantity of retail electricity sales. Accordingly, the Company uses employment as a forecast driver in its regression-based forecast of Oregon commercial use-per-day and industrial use-per-day. On page 4 of Appendix A, related to employment, the Company identifies that "the relationship between the economic variable and sales has "flattened", meaning electric usage has become less responsive to the economic variable."

Parties' Positions

PAC
PAC believes its current methodology is reasonable, but continues to monitor relationships among economic drivers and loads. PAC intends to improve the handling of LED streetlight load, but notes the changes will not impact forecasts.

Staff
After Staff's Initial Comments, Staff investigated an additional issue in PAC's forecasts. In response to Staff DR 58, PAC described that it has not considered using additional forecast drivers in its street lighting load forecast.[84] Staff believes that additional forecast drivers could help the Company more accurately model energy savings due to customers switching to LEDs for street lighting. Staff recommends that the Company search for an additional forecast driver related to the switch to LEDs for street lighting and consult with Energy Trust of Oregon based on their experience incentivizing LED street light replacements.

Staff Recommendation

Recommendation regarding Load Forecasting and Load and Resource Balance
Staff recommends that PAC continue to investigate two additional load forecasting issues. The first issue, the changing relationship between economic variables and load, has an indeterminate impact on the load forecast. PacifiCorp has indicated that the second issue, modeling the impact of LED lighting adoption more accurately, will be resolved in future IRPs.

Modeling and Portfolio Approach and Results

Overview
The 2017 IRP modeling and evaluation approach consists of three screening stages used to select a preferred portfolio, including Regional Haze screening, eligible portfolio screening, and final screening. PacifiCorp uses the SO model to produce unique resource portfolios across a range of different planning assumptions. Informed by the public input process, PacifiCorp ultimately produced and evaluated 43 different SO portfolios for its 2017 IRP. PacifiCorp uses Planning and Risk (PaR) to perform stochastic risk analysis of the portfolios produced by SO. For each SO portfolio, PaR studies are developed for three natural gas price scenarios (low, base, and high) and two CO_2 emissions limit assumptions, which together form six price-emissions scenarios. The resulting cost and risk metrics are then used to compare portfolio alternatives and inform selection of the preferred portfolio. Taking into consideration stakeholder comments received during the public input process, PacifiCorp also developed 24 sensitivity cases designed to highlight the impact of specific planning assumptions on future resource selections along with the associated impact on system costs and stochastic risks. Six of the sensitivities developed over the course of the 2017 IRP were considered for the preferred portfolio.

[84] *See* PAC's response to Staff IR 58.

Parties' Positions

PAC
PacifiCorp noted that it considered several diverse renewable resources for portfolio selection.

Staff
Staff concludes that the model and portfolio evaluation completed by PAC are robust and of a level of complexity well suited for the IRP process. Nevertheless, Staff has continued concerns regarding PAC's use of Monte Carlo analysis in the study. Specifically, the Company uses the stochastic mean of 50 iterations in its analysis. In response to OPUC data request 7, PAC states that the stochastic mean is the appropriate measure of central tendency, and is intended to capture the influence of all iterations. Regarding the Company's treatment of loss of load probability and cumulative CO_2 emissions in the IRP, Staff is satisfied that the model framework is sufficient to capture future shifts in CO_2 emission rules, although additional modeling of scenarios is recommended. Staff is satisfied with the model robustness.

In terms of modeling and model results, stakeholder comments did not generally address the mathematics of PAC's model, but instead focused on the variety of core cases, breadth, and results of the model.

Staff Recommendation

Recommendation regarding Modeling and Portfolio Approach and Results
Staff recommends that the Company investigate a more diverse renewable portfolio in future IRPs and IRP updates. Staff also recommends that PAC re-run its model under the assumption that EPA regional haze litigation against the Company is successful and that PacifiCorp will be required to comply with the current requirements of the State Implementation Plan (SIP) and Federal Implementation Plan (FIP) under litigation.

Stochastic Parameters

Overview
PAC updated and re-estimated its 2015 stochastic parameters for use in the current PaR model runs. The purpose of the PaR model is to stochastically shock the electricity price forecast (and other key drivers) to develop scenarios for uncertainty forecasting. PAC uses a two-factor mean reverting model.

The general process used by the Company in the development of its stochastic parameters is as follows: short term uncertainty process parameters are assessed, statistical distributions and time steps for uncertainty quantification are chosen, data

sets are selected for the chosen time step, a decision of how to treat missing variables (i.e., disregard versus interpolate) is made, uncertainty is estimated by looking at the daily price deviation for the variables, price expectations are calculated, and uncertainty parameters are computed for each variable by regression analysis.

The results of the PaR are then interpreted by evaluating the slope (which relates the autocorrelation and mean reversion rate to give information on how much price shock from the previous time period propagates into the next time period), intercept (which implies the long-run mean of the price index), and volatility of the price movements.

Short run stochastic parameters were used in the IRP, and the Company set long run parameters to zero because PAC cannot re-optimize its capacity expansion plan. Consequently, only the expected yearly price and load growths are simulated for the forecast horizon.

PAC
PacifiCorp states in comments filed on October 30, 2017, "PacifiCorp is open to including explanation for sometimes low correlation in the short-term forecast as relevant for future IRPs."

Staff
PAC explained that the key drivers that affect price determination fall into two categories: load and fuel. The Company stated that targeting only key variables simplifies the analysis while effectively capturing sensitivities of the larger subset of individual variables which fall under the penumbra of the key drivers.

Staff Recommendation

Recommendation regarding Stochastic Parameters
Staff appreciates the Company's detailed explanation of how distributions were chosen, and how seasonal and regional correlations were developed. Staff encourages the Company in IRP updates to clearly explain the reasons for the (sometimes) low correlations in the short term forecast.

Flexible Reserve Study

Overview
The 2017 Flexible Reserve Study (FRS) estimates the regulation reserve required to maintain PAC's system reliability and comply with North American Electric Reliability Corporation (NERC) reliability standards, as well as the incremental cost of this regulation reserve. PAC's overall operating reserve requirements (regulation and

contingency) are also compared to its flexible resource supply across the IRP study period. PAC must maintain sufficient regulation reserve to remain within NERC's Balancing Authority Area (BAA) control error limit in compliance with a new standard that became effective on July 1, 2016 (BAL-000-01-2). This standard requires a utility to compensate for changes in load demand and generation output by estimating the amount of regulation reserve required to manage variations in load. PAC's study concludes that the regulation reserve burden associated with wind deviations from scheduled amounts are twice the amount associated with solar, three time the amount associated with load, and four times the amount associated with non-VERs. As a result, PAC attributes different levels of regulation reserve to load, wind, solar and non-VERs. Based on the information available to Staff in the IRP, there appears to be justification for PAC to attribute different levels of regulation reserve to these variables.

PAC
PacifiCorp stated in comments filed on October 30, 2017, "To the extent the value streams identified in the storage potential evaluation are also applicable to other flexible resource types (such as natural gas, as referenced in Staff's comments), PacifiCorp agrees that it would be appropriate to include consistent assumptions for all resource types. PacifiCorp intends to include the best information available on all resources for its 2017 IRP Update, but notes that the results of the Energy Storage Potential Evaluation may be limited or preliminary when the IRP Update is prepared. As a result, further refinement of the assumptions for flexible resources modeled in the IRP is expected in the 2019 IRP and beyond."

Staff
Staff appreciates the Company's responsiveness to inquiries surrounding the FRS. While Staff has some concerns about the robustness of the resource set analyzed in the FRS, the modeling strategy used by the Company appears to be reasonable. Staff had initial concerns regarding the extent of exclusion of real data from the FRS analysis, particularly load data. PAC, in response to Staff data requests, provided data showing the extent of the exclusion and explained that statistical testing to determine the cause of data anomalies leading to exclusion was unnecessary due to the readily identifiable nature of error types (e.g. instrument errors). Staff is satisfied that the Company has adequately utilized available data and that the omission of clearly erroneous data is not harmful to the FRS analysis. Staff is also satisfied that the scaling factor used by the Company is appropriate. The scaling factor as explained by PAC in response to Staff inquiries is a percentage change from the from the less than 55 minutes from the hour in question (T-55) data point to the hourly average load for the upcoming hour. The actual scaling factor from one week prior is applied to the load value at T-55 to estimate the hourly load base schedule for the upcoming hour.

Staff Recommendation

Recommendation regarding Flexible Reserve Study
Staff recommends that the Company model natural gas and storage for meeting FRS needs in the next IRP update.

Distribution System Planning

Overview
Staff believes that there is need for creating a more comprehensive, transparent look at how the Company is planning for grid modernization that would link elements of the Smart Grid reports, existing distribution planning, IRP planning and the various dockets focused on locational value of DERs. This transition warrants new tools and approaches to communicating planning for the benefit of customers, beyond the current Smart Grid Report format.

Parties' Positions

NWEC
NWEC provides strong support for improving coordination between IRP and distribution system planning as well as "more accountability and public review of distribution planning" with suggestions for what a first phase might include.[85]

PAC
PacifiCorp indicates that it welcomes further discussions with Staff to address Staff's concerns and to help Staff better assess PacifiCorp's distribution system planning.

Staff
Staff plans to further explore how some form of integrated planning between IRP and DSP would be useful for the Commission, other stakeholders, and PAC.

Staff Recommendation

Recommendation regarding Distribution System Planning
Staff recommends that the Commission direct the Company to work with Staff and other parties to advance distributed energy resource forecasting and representation in the IRP, and to work with staff to define a proposal for opening a distribution system planning investigation.

[85] NWEC Comments: http://edocs.puc.state.or.us/efdocs/HAC/lc67hac163524.pdf , p. 12.

Smart Grid Report

Overview
Staff believes there is a potential opportunity for PAC to use data collected from AMI for integrated resource planning purposes.

NWEC
NWEC provided the following summary of recommendations in its comments, filed on October 30, 2017:

> Support staff's general comments and recommendations related to Distribution System Planning and Smart Grid.[86]

PAC
PacifiCorp indicated that it is and will continue to evaluate AMI data and associated analytics as an opportunity to leverage additional AMI value in Oregon. PacifiCorp believes it is premature to provide additional detail regarding the use of AMI data in its planning and resource applications until the breadth of the data analytics and its value can be adequately explored.

Staff
Staff noted in multiple rounds of comments in this proceeding that the Company's *2016 Smart Grid Report*, and the more recently filed *2017 Smart Grid Report*, failed to identify whether PacifiCorp ever intends to use AMI data in its integrated resource planning.

Staff Recommendation

Recommendation regarding Smart Grid Report
Staff recommends that the Commission direct the Company to work with Staff and other parties to explore the use of AMI data in its integrated resource planning in future IRPs.

Compliance with Order 16-174 (Capacity Value of Existing QFs)

Overview
Phase II of the Commission's investigation into Qualifying Facility Contracting and Pricing (Docket UM 1610) continued the evaluation of policies and procedures to implement the Public Utility Regulatory Policies Act (PURPA). Specifically, the docket considered proposals to revise the rates, terms, and conditions for QF standard and non-standard contracts in Oregon. As in Phase I, consideration was given to the

[86] LC 67 NW Energy Coalition Comments on Staff Final Comments PAC IRP, p.3.

proposals in the context of federal and state law and prior orders addressing these issues, and declining to make changes without compelling evidence of a need for revision. Order No. 16-174 required the following:

> 1. Within 60 days of the date of this order, each electric utility will file by application, and serve upon all parties to these proceedings, revised standard contract forms that set forth standard rates, terms and conditions that are consistent with the resolutions made in this order.
>
> 2. The revised standard contract forms shall become effective 30 days after the date of filing, unless otherwise suspended by the Oregon Public Utility Commission.
>
> 3. Each electric utility will also file revised avoided cost schedules that implement the resolutions made in this order.
>
> 4. Staff is directed to file reports as specified in certain resolutions made in this order.[87]

Parties' Positions

REC

The Coalition filed its final comments October 30, 2017.[88] It notes that in Docket No. UM1610, the Commission directed the Company to evaluate the benefits of the capacity contribution provided by existing qualifying facilities (QFs) in its next IRP. The Coalition cites the relevant Commission Order:

> We agree with Staff and the Joint QFs that a certain amount of capacity deferral may not be valued when utilities assume in their IRPs that existing QFs nearing contract expiration will automatically renew. We direct each utility to work with parties to address this issue in its next IRP.[89]

The Coalition notes that, while in the text of the IRP it is stated that purchases from small QFs are extended through the end of the IRP study period, this was subsequently found not to be the case. It asserts that PacifiCorp took action regarding its treatment of QFs specifically to avoid complying with Commission Order No. 16-147.

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[87] Order No. 16-174 at 31.

[88] The Coalition's final comments can be found at http://edocs.puc.state.or.us/efdocs/HAC/lc67hac1604.pdf

[89] Re Investigation Into QF Contracting and Pricing, Docket No. UM 1610, Order No. 16-174 at 2 (May 13, 2016).

The Coalition concludes: "The final Staff report should recommend, and the Commission should ultimately adopt, a requirement for PacifiCorp to calculate the capacity value provided by QFs under contract."[90]

Staff Recommendations

Recommendation regarding Compliance with Order No. 16-174
Staff recommends that PacifiCorp either comply with Order 16-174 in Docket No. 1610 immediately, or explain to the Commission why it cannot.

Conclusion

Staff appreciates the hard work of PacifiCorp and each of the parties in this case. Staff maintains the recommendations first set forth in Staff's Final Comments filed on October 6, 2017, and reiterated in this report. The following table provides a summary of Staff's recommendations in this proceeding.

2017 Action Plan			
Area	**Item #**	**Description**	**Staff Recommendation**
Renewables	1a	Wind repowering	Not acknowledge. If acknowledge, consider certain conditions.
	1b	New Wind	Not acknowledge. If acknowledge, consider certain conditions.
	1c	RFP for RECs	Acknowledge.
	1d	Sell RECs	Acknowledge.
Transmission	2a	Aeolus to Bridger/Anticline	Not acknowledge. If acknowledge, consider certain conditions.
	2b	Energy Gateway permitting	Acknowledge.
	3c	Wallula to McNary construction	Acknowledge.
	4d	Planning studies	Acknowledge.

[90] Renewable Energy Coalition's Comments Regarding Staff Recommendation, p.5.

Firm Market Purchases	3a	FOT	Acknowledge with additional Action Item proposed by Staff.
DSM	4a	DSM	Acknowledge with additional Action Item proposed by Staff.
Coal Resource Actions	5a	Hunters #1 & #2	Acknowledge with additional Action Item proposed by Staff.
	5b	Huntington #1 & #2	Acknowledge with additional Action Item proposed by Staff.
	5c	Dave Johnston #3	Acknowledge with additional Action Item proposed by Staff.
	5d	Jim Bridger #1 &#2	Acknowledge with additional Action Item proposed by Staff.
	5e	Naughton #3	Acknowledge with additional Action Item proposed by Staff.
	5f	Wyodak	Acknowledge with additional Action Item proposed by Staff.
	5g	Cholla #4	Acknowledge with additional Action Item proposed by Staff.
	5h	Craig #1	Acknowledge with additional Action Item proposed by Staff.
New Action Items for Next IRP		Additional Statistical Analysis	Acknowledge.
		Flexible Reserve Analysis	Acknowledge.
		QF PURPA Compliance	Acknowledge.
		Additional RPS Analysis	Acknowledge.
		Load forecasting Analysis	Acknowledge.
Staff Recommended New Action Items for Next IRP		Distribution System Planning	Acknowledge
		Smart Grid Report	Acknowledge
		Compliance with Order 16-174 (Capacity Value of Existing QFs)	Acknowledge

PROPOSED COMMISSION MOTION:

Acknowledge in part and decline to acknowledge in part PAC's 2017 Integrated Resource Plan. Staff recommends certain actions and additional requirements for inclusion in an IRP update.

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Action Item	1. Renewable Resource Actions
1a	**<u>Wind Repowering</u>** • PacifiCorp will implement the wind repowering project, taking advantage of safe-harbor wind-turbine-generator equipment purchase agreements executed in December 2016. – Continue to refine and update the economic analysis of plant-specific wind repowering opportunities that maximize customer benefits before issuing the notice to proceed. – By September 2017, complete technical and economic analysis of other potential repowering opportunities at PacifiCorp wind plants not studied in the 2017 IRP (i.e., Foote Creek I and Goodnoe Hills). – Pursue regulatory review and approval as necessary. – By May 2018, issue the engineering, procurement, and construction (EPC) notice to proceed to begin implementing the wind repowering for specific projects consistent with updated financial analysis. – By December 31, 2020, complete installation of wind repowering equipment on all identified projects.

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1b	**<u>Wind Request for Proposals</u>** • PacifiCorp will issue a wind resource request for proposals (RFP) for at least 1,100 MW of Wyoming wind resources that will qualify for federal wind production tax credits and achieve commercial operation by December 31, 2020. [Note PacifiCorp has subsequently opened its 2017R RFP to all wind that can connect anywhere on its system (See Docket No. UM 1845). This RFP was released to market September 27, 017 and is available for review online at PacifiCorp.com – April 2017, notify the Utah Public Service Commission of intent to issue the Wyoming wind resource RFP. – May-June, 2017, file a draft Wyoming wind RFP with the Utah Public Service Commission and the Washington Utilities and Transportation Commission. – May-June, 2017, file to open a Wyoming wind RFP docket with the Public Utility Commission of Oregon and initiate the Independent Evaluator RFP. – June-July, 2017, file a draft Wyoming wind RFP with the Public Utility Commission of Oregon and file a Public Convenience and Necessity (CPCN) application with the Public Service Commission of Wyoming. – By August 2017, obtain approval of the Wyoming wind resource RFP from the Public Utility Commission of Oregon, the Utah Public Service Commission, and the Washington Utilities and Transportation Commission. – By August 2017, issue the Wyoming wind RFP to the market. – By October 2017, Wyoming wind RFP bids are due. – November-December, 2017, complete initial shortlist bid evaluation.

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	– By January 2018, complete final shortlist bid evaluation, seek acknowledgement of the final shortlist from the Public Utility Commission of Oregon, and seek approval of winning bids from the Utah Public Service Commission. – By March 2018, receive CPCN approval from the Wyoming Public Service Commission. – Complete construction of new wind projects by December 31, 2020.

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1c	**<u>Renewable Portfolio Standard Compliance</u>** • PacifiCorp will issue unbundled REC request for proposals (RFP) to meet its state RPS compliance requirements. – As needed, issue RFPs seeking then-current-year or forward-year vintage unbundled RECs that will qualify in meeting California renewable portfolio standard targets through 2020. – As needed, issue RFPs seeking low-cost then-current-year, forward-year, or older vintage unbundled RECs that will qualify in meeting Oregon renewable portfolio standard targets, deferring the currently projected 2035 initial shortfall after accounting for preferred portfolio renewable resources.
Action Item	2. Transmission Actions
2a	**<u>Aeolus to Bridger/Anticline</u>** • By December 31, 2020, PacifiCorp will build the 140-mile, 500 kV transmission line running from the Aeolus substation near Medicine Bow, Wyoming, to the Jim Bridger power plant (a sub-segment of the Energy Gateway West transmission project). This includes pursuing regulatory review and approval as necessary. – June-July 2017, file a CPCN application with the Public Service Commission of Wyoming. – By March 2018, receive conditional CPCN approval from the Wyoming Public Service Commission pending acquisition of rights of way. – By December 2018, obtain Wyoming Industrial Siting permit and issue EPC limited notice to proceed.

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	– By April 2019, issue EPC final notice to proceed. – Complete construction of the transmission line by December 31, 2020.
2b	Energy Gateway Permitting • Continue permitting for the Energy Gateway transmission plan, with the following near-term targets: – For Segments D1, D3, E, and F, continue funding of the required federal agency permitting environmental consultant actions required as part of the federal permits. – For Segments D, E, and F, continue to support the projects by providing information and participating in public outreach. – For Segment H (Boardman to Hemingway), continue to support the project under the conditions of the Boardman to Hemingway Transmission Project Joint Permit Funding Agreement.
2c	Wallula to McNary 230 kV Transmission Line • Complete Wallula to McNary project construction per plan with a 2018 expected in-service date. Continue to support the permitting and construction process for Walla Walla to McNary.
2d	**Planning Studies** • Complete planning studies that include proposed coal unit retirement assumptions from the 2017 IRP preferred portfolio and two other scenarios. • Summarize studies in the 2017 IRP Update.
Action Item	3. Firm Market Purchase Actions
3a	**Front Office Transactions** • Acquire economic short-term firm market purchases for on-peak

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	summer deliveries from 2017 through 2019 consistent with the Risk Management Policy and Commercial and Trading Front Office Procedures and Practices. These short-term firm market purchases will be acquired through multiple means: – Balance of month and day-ahead brokered transactions in which the broker provides the service of providing a competitive price. – Balance of month, day-ahead, and hour-ahead transactions executed through an exchange, such as Intercontinental Exchange (ICE), in which the exchange provides the service of providing a competitive price. – Prompt month-forward, balance-of-month, day-ahead, and hour-ahead non-brokered transactions.
Action Item	4. Demand Side Management Actions
4a	**<u>Class 2 DSM</u>** • Acquire cost-effective Class 2 DSM (energy efficiency) resources targeting annual system energy and capacity selections from the preferred portfolio as summarized in the following table. PacifiCorp's state-specific processes for planning for DSM acquisitions is provided in Appendix D in Volume II of the 2017 IRP.

Year	Annual Incremental Energy (GWh)	Annual Incremental Capacity* (MW)
2017	646	154
2018	559	128
2019	571	131
2020	527	122

*Class 2 DSM capacity figures reflect projected maximum annual hourly

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	energy savings, which is similar to a nameplate rating for a supply-side resource.
Action Item	5. Coal Resource Actions
5a	**<u>Hunter Units 1 and 2</u>** • The EPA's final Regional Haze Federal Implementation Plan (FIP) for Utah requires the installation of selective catalytic reduction (SCR) on Hunter Units 1 and 2 in 2021 and is currently under appeal by the state of Utah and other parties in the U.S. Tenth Circuit Court of Appeals. • As influenced by the litigation schedule and outcomes, PacifiCorp will update its economic analysis of alternative Regional Haze compliance strategies for the units, as applicable, and will provide the associated analysis in a future IRP or IRP Update.
5b	**<u>Huntington Units 1 and 2</u>** • The EPA's final Regional Haze FIP for Utah requires the installation of SCR on Huntington Units 1 and 2 in 2021 and is currently under appeal by the state of Utah and other parties in the U.S. Tenth Circuit Court of Appeals. • As influenced by the litigation schedule and outcomes, PacifiCorp will update its economic analysis of alternative Regional Haze compliance strategies for the units, as applicable, and will provide the associated analysis in a future IRP or IRP Update.
5c	**<u>Dave Johnston Unit 3</u>** • The EPA's final Regional Haze FIP requires the installation of SCR at Dave Johnston Unit 3 in 2019 or a commitment to shut down Dave Johnston Unit 3 by the end of 2027. PacifiCorp's commitment to the

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	latter must be included in a permit before the 2019 compliance deadline. • PacifiCorp will update its analysis of the commitment to shut down Dave Johnston Unit 3 by the end of 2027 as part of its 2017 IRP Update.
5d	**Jim Bridger Units 1 and 2** • The Wyoming Regional Haze State Implementation Plan (SIP) and EPA's final Regional Haze FIP for Wyoming require the installation of SCR on Jim Bridger Units 1 and 2 in 2021 and 2022. • PacifiCorp will update its economic analysis of alternative Regional Haze compliance strategies for the units and will provide the associated analysis in its 2017 IRP Update.
5e	**Naughton Unit 3** • PacifiCorp will update its economic analysis of natural gas conversion in its 2017 IRP Update.
5f	**Wyodak** • Continue to pursue PacifiCorp's appeal of the portion of EPA's final Regional Haze FIP that requires the installation of SCR at Wyodak, recognizing that the compliance deadline for SCR under the FIP is currently stayed by the court. • If following appeal, EPA's final FIP as it pertains to installation of SCR at Wyodak is upheld (with a modified schedule that reflects the final stay duration), PacifiCorp will update its evaluation of alternative compliance strategies that will meet Regional Haze compliance obligations and provide the associated analysis in a future IRP or IRP Update.
5g	**Cholla Unit 4** • EPA has approved the Arizona SIP incorporating an alternative

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	Regional Haze compliance approach that avoids installation of SCR with a commitment to cease operating Cholla Unit 4 as a coal-fueled resource by the end of April 2025, with the option of natural gas conversion thereafter. • PacifiCorp will update its evaluation of Cholla Unit 4 alternatives that meet its Regional Haze compliance obligations and provide the associated analysis in a future IRP or IRP Update.
5h	**Craig Unit 1** • EPA is yet to approve the Colorado SIP incorporating an alternative Regional Haze compliance approach that avoids installation of SCR with a commitment to cease operating Craig Unit 1 as a coal-fueled resource by the end of 2025, with an option for natural gas conversion. • PacifiCorp will update its evaluation of Craig Unit 1 alternatives that meet its Regional Haze compliance obligations and provide the associated analysis in a future IRP or IRP Update, as required.