

LC57

ITEM NO. 1

PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: May 28, 2014

REGULAR X CONSENT _____ EFFECTIVE DATE Upon Commission Approval

DATE: May 21, 2014

TO: Public Utility Commission

FROM: Juliet Johnson

THROUGH: Jason Eisdorfer, Maury Galbraith, and Aster Adams

SUBJECT: PACIFICORP: (Docket No. LC 57) PacifiCorp's 2013 Integrated Resource Plan.

RECEIVED
MAY 22 2014

Public Utility Commission of Oregon
Administrative Hearings Division

STAFF RECOMMENDATION:

Staff recommends the Commission 1) adopt the consensus resolutions described in this memo and 2) make a final determination on action items related to pollution control at Bridger Units 3 and 4 and the Sigurd to Red Butte transmission line.

DISCUSSION:

Staff prepared a public meeting memo with a summary of Staff's, PacifiCorp (or the Company)'s, and parties' positions in this docket for a public meeting with Commissioners on March 17, 2014. Refer to that memo for a complete description of Staff and parties positions in this case. Staff also prepared a draft final order for this docket. At the special public meeting on March 17, 2014, there was agreement by the Commissioners with Staff on most of items in this IRP. For a few items minor changes were recommended and there were two items for which there was not agreement. The two items for which there is not agreement are:

- 1) Installation of selective catalytic reduction (SCR) equipment Bridger Units 3 and 4, and
- 2) Construction of the Sigurd to Red Butte transmission line.

Agreed Upon Items

There was general agreement on the following items recommended by Staff:

- Acknowledge - Action Item 1b. Renewable Portfolio Standard Compliance
- Acknowledge - Action Item 1d. Solar

DOCKETED

- Acknowledge - Revised Action Item 7. Demand Side Management Actions
- Acknowledge - Revised Action Item 8a. Naughton Unit 3
- Not Acknowledge - Action Item 8b. Hunter Unit 1
- Acknowledge - Revised Action Item 8d. Cholla Unit 4
- Acknowledge - New Action Item 8e. Craig and Hayden
- Acknowledge - New Action Item 8f. Wyodak
- Acknowledge - New Action Item 8g. Carbon Analysis
- Acknowledge - New Action Item 8h. Screening Tool

Staff suggested that business as usual type action items do not require acknowledgement. Staff sees the following action items as falling into that category and does not recommend the Commission explicitly acknowledge those items:

- Action Item 1a – Wind Integration
- Action Item 1c – Renewable Energy Credit Optimization
- Action Item 1e – Capacity Contribution
- Action Item 2a – Distributed Solar
- Action Item 2b – Combined Heat & Power (CHP)
- Action Item 3a – Front Office Transactions
- Action Item 4a – Energy Imbalance Market
- Action Item 5 – Natural Gas Request for Proposal
- Action Item 6a – Plant Efficiency Improvements
- Action Item 7b – Class 3 DSM
- Action Item 9a – System Operational and Reliability Benefits Tool (SBT)
- Action Item 10 – Planning Reserve Margin Actions
- Action Item 11a – Modeling and Process
- Action Item 11b – Cost/Benefit Analysis of DSM Resource Alternatives

Modified Action Items

Small changes were proposed to certain action items at the March 17, 2014 public meeting. Those changes are described here.

Staff's originally proposed Action Items 8i, 8j, and 8k were:

Action Item 8i. – Timelines

As part of future IRPs, the Company shall provide documentation of timelines and key decision points for expected pollution control options.

Action Item 8j. – Planned expenditures

As part of future IRPs, the Company shall provide tables detailing major planned expenditures with estimated cost in each year for each generating facility, under different modeled scenarios.

Action Item 8k. – Quarterly updates

Following the issuance of the final Commission order in this IRP, starting in the third quarter of 2014, the Company shall come before the Commission at a public meeting and make quarterly updates on coal plant compliance requirements, legal proceedings, pollution control investments, and other major capital expenditures at the Company's coal plants.

At the March 17, 2014 public meeting, the Commission recommended that updates and timelines not only include coal plant investments, but also transmission investments. The Company also confirmed that it could file paper reports instead of making a presentation if there had been no significant changes between periods. Based on that feedback, Staff combined and modified Action Items 8i-8k into a new 8i as shown below:

Revised Action Item 8i – Requirements for future IRPs and IRP Updates

Beginning in the third quarter of 2014, PacifiCorp will appear before the Commission to provide quarterly updates on coal plan compliance requirements, legal proceedings, pollution control investments, and other major capital expenditures on its coal plants or transmission projects. PacifiCorp may provide a written report and need not appear if there are no significant changes between periods.

In future IRPs, PacifiCorp will provide:

- Timelines and key decision points for expected pollution control options and transmission investments; and
- Tables detailing major planned expenditures with estimated costs in each year for each plant or transmission project, under different modeled scenarios.

At the public meeting on March 17, 2014, small changes were recommended to Staff's suggested additions to Action Item 7a relating to Class 2 DSM. Clarifications were suggested relative to the Implementation Plan and DSM acquisitions from large special contract customers. Staff's originally proposed additions to Action Item 7a said:

- Provide twice yearly updates on the status of DSM IRP acquisition goals to the Oregon Commission in 2014 and 2015 at regular public meetings. Summarize

where efforts have deviated from previously agreed upon action items and report on progress toward specific DSM targets for all states other than Oregon. As part of these updates, provide information on progress in exploring energy efficiency opportunities with special contract customers in next round of contract negotiations.

- Include in the 2014 conservation potential study an Implementation Plan specific to PacifiCorp service territory for all states other than Oregon which quantifies how much Class 2 DSM programs can be accelerated and how much it will cost to accelerate acquisition.
- In the 2015 IRP and in quarterly updates, report back on the status of negotiating energy efficiency projects with special contract customers.
- Going forward, in future IRPs, the Company will provide yearly Class 1 and Class 2 DSM acquisition targets in both GWh and MW for each year in the planning period, by state.

The revised additions are as follows:

- Provide twice yearly updates on the status of DSM IRP acquisition goals to the Commission in 2014 and 2015, including a summary of DSM acquisitions from large special contract customers. Summarize where efforts have deviated from previously agreed upon action items and report on progress toward specific DSM targets for all states other than Oregon.
- Include in the 2014 conservation potential study information specific to PacifiCorp's service territory for all states other than Oregon that quantifies how much Class 2 DSM programs can be accelerated and how much it will cost to accelerate acquisition.
- Include a PacifiCorp service area specific implementation plan as part of the 2015 IRP filing. At twice yearly updates to the Commission, provide a summary of savings potential, gaps and how PacifiCorp's specific implementation plan and programs are achieving the identified potential.
- In future IRPs, PacifiCorp will provide yearly Class 1 and Class 2 DSM acquisition targets in both GWh and MW for each year in the planning period, by state.

Lastly, Staff's proposed revised Action Item 9b was modified slightly. The originally proposed action items said:

*Action Item 9b. - Energy Gateway Permitting
Continue permitting Segments D, E, F, and H until PacifiCorp files its 2015 IRP,
when SBT analyses for these segments will be performed.*

At the meeting, the Company recommended changing "will" to "may" because it was indicated that these segments may not be ready to be analyzed and presented when the 2015 IRP is submitted. Therefore, Staff recommends Action Item 9b be modified to read:

*Action Item 9b. - Energy Gateway Permitting
Continue permitting Segments D, E, F, and H until PacifiCorp files its 2015 IRP,
when SBT analyses for these segments may be performed.*

Attachment A contains a clean copy of all of Staff's proposed action items.

Bridger Units 3 and 4

In the memo for the March 17, 2014 public meeting, Staff recommended the Commission acknowledge SCR investments at Bridger Units 3 and 4.

PacifiCorp had proposed the following actions for Jim Bridger Units 3 and 4 (Action Item 8c).

- *Complete installation of selective catalytic reduction (SCR) compliance projects at Jim Bridger Unit 3 and Jim Bridger Unit 4 as required by the end of 2015 and 2016, respectively.*

In Staff's March 17, 2014 memo, it was pointed out that while Staff believes there are deficiencies in PacifiCorp's analysis, Staff recognizes the importance of the Bridger facility to PacifiCorp's system. Staff further notes that Bridger provides important ancillary services to the system, including voltage and frequency regulation and response as well as energy imbalance correction and operating reserves to the balancing authorities.

Sierra Club, RNP, NWEA, and CUB do not support acknowledgement of Action Item 8c. Sierra Club points to many flaws in PacifiCorp's analysis, including the company's failure to recognize that retirement of the plants would free up significant transmission

capacity that could defer near-term planned investments. Sierra Club suggests that PacifiCorp's decision to retain these two units is related to its requirement to collect sufficient remediation funds to close Bridger Surface Mine.

RNP does not support acknowledgment because it does not believe investing in coal units is reasonable under scenarios with low natural gas costs or stringent CO2 regulation, or both, and because of the lack of analysis regarding alternative compliance proposals. Similarly, NWECC does not support acknowledgment of any action items related to coal investments because it argues PacifiCorp underestimates the cost of risk of continued reliance on coal and fails to analyze several coal units that should have been evaluated in the 2013 IRP, and that this IRP fails to comply with IRP guidelines. Finally, CUB argues that PacifiCorp's early retirement analysis is flawed and, without a better analysis, it is unclear whether phasing out the plants would be cost effective.

PacifiCorp generally responds that its analysis was comprehensive and covered viable compliance alternatives across a range of natural gas and CO2 assumptions. PacifiCorp notes that it performed phase-out scenarios assuming operation without SCR investment through 2020 and 2021 and also, at Staff's request, through 2022 and 2023. Further, PacifiCorp asserts it analyzed a wide range of CO2 price scenarios in the portfolio development process, which included costs to comply with prospective future regulations of various types. PacifiCorp argues that its analysis supports the SCR investments as the lowest cost alternative even when high CO2 prices are paired with either base case or high natural gas prices.

In response to Sierra Club's transmission savings argument, PacifiCorp argues that the Windstar to Populus Energy Gateway transmission decision was independent of these decisions and that there are other benefits to the transmission project, such as reliability, increased access to wind and other resources and efficient use of the system.

Following the March 17, 2014 special public meeting, the Commission asked Staff to compare PacifiCorp's analysis of Bridger Units 3 and 4 to Idaho Power's analysis. A copy of Staff's response is attached as Appendix B to this memo.

On May 13, 2014, Sierra Club sent a letter to the Commission regarding the treatment of Bridger in an on-going rate case in Utah and attached Sierra Club's redacted Direct Testimony in that case. The testimony calls into question the underlying coal costs serving the Bridger facility, which, Sierra Club argues, could impact the present value of revenue requirement of the various resource options analyzed in LC 57 for Bridger 3 and 4. Sierra Club also raises issues of the timing of the release of this information. PacifiCorp, however, has not had the opportunity to respond to Sierra Club's assertions in the on-going docket in Utah. The timing of this issue does not allow Staff to conduct

a complete analysis prior to the Special Public Meeting on May 28th. The Commission will have the opportunity in a later rate case to determine the prudence of any resource action which is included in that rate case.

Sigurd to Red Butte

In Action Item 9c, PacifiCorp seeks acknowledgement for completing construction of the Sigurd-to-Red Butte (S2RB) transmission line. PacifiCorp originally sought, but did not obtain, acknowledgment of the line in the 2011 IRP.

ICNU opposes acknowledgment because PacifiCorp has already begun construction of this transmission line. ICNU also questions whether PacifiCorp's transmission plans adequately account for expected future conditions and notes that concerns have been raised in Washington about whether PacifiCorp is focused on building transmission rather than other alternatives, such as smart grid technology.

Staff and RNP recommend acknowledgment of Action Item 9c. Because the primary beneficiaries of the line are PacifiCorp's network transmission customers in southwest Utah, Staff contends that the costs should be allocated accordingly. Staff adds that the allocation of costs should be addressed in an appropriate forum.

This transmission segment was not addressed at the March 17, 2014 public meeting. The Commissioners sent bench requests to PacifiCorp related to Sigurd to Red Butte.

PROPOSED COMMISSION MOTION:

The consensus items and modified items described in this memo be adopted. The Commission make a final determination on Bridger Units 3 and 4 and Sigurd to Red Butte.

Attachment A

LC 57 Staff's Modified Action Items

Renewable Resource Actions

Action Item 1b. - Renewable Portfolio Standard Compliance

With renewable portfolio standard (RPS) compliance achieved with unbundled renewable energy credit (REC) purchases, the preferred portfolio does not include incremental renewable resources prior to 2024. Given that the REC market lacks liquidity and depth beyond one year forward, the Company will pursue unbundled REC requests for proposal (RFP) to meet its state RPS compliance requirements.

- Issue at least annually, RFPs seeking then current-year or forward-year vintage unbundled RECs that will qualify in meeting Washington renewable portfolio standard obligations.
- Issue at least annually, RFPs seeking historical, then current-year, or forward-year vintage unbundled RECs that will qualify for Oregon renewable portfolio standard obligations. As part of the solicitation and bid evaluation process, evaluate the tradeoffs between acquiring bankable RECs early as a means to mitigate potentially higher cost long-term compliance alternatives.
- Issue at least annually, RFPs seeking then current-year or forward-year vintage unbundled RECs that will qualify for California renewable portfolio standard obligations.

Action Item 1d. - Solar

- Issue an RFP in the second quarter of 2013 soliciting Oregon solar photovoltaic resources to meet the Oregon small solar compliance obligation (Oregon House Bill 3039). Coordinate the selection process with the Energy Trust of Oregon to seek 2014 project funding. Complete evaluation of proposals and select potential winning bids in the fourth quarter of 2013.
- Issue a request for information 180 days after filing the 2013 IRP to solicit updated market information on utility scale solar costs and capacity factors.

Demand Side Management (DSM) Actions

Action Item 7a. - Class 2 DSM

Acquire 1,425 – 1,876 GWh of cost-effective Class 2 energy efficiency resources by the end of 2015 and 2,034 – 3,180 GWh by the end of 2017.

- Collaborate with the Energy Trust of Oregon on a pilot residential home comparison report program to be offered to Pacific Power customers in 2013 and 2014. At the conclusion of the pilot program and the associated impact evaluation, assess further expansion of the program.
- Implement an enhanced consolidated business program to increase DSM acquisition from business customers in all states excluding Oregon.

- Utah base case schedule is 1st quarter 2014 with an accelerated target of 3rd quarter 2013.
- Washington base case schedule is 4th quarter 2014, with an accelerated target of 1st quarter 2014.
- Wyoming, California, and Idaho base case schedule is 4th quarter 2014, with an accelerated target of 2nd quarter 2014.
- Accelerate to the 2nd quarter of 2014, an evaluation of waste heat to power where generation is used to offset customer requirements – investigate how to integrate opportunities into the DSM portfolio.
- Increase acquisitions from business customers through prescriptive measures by expanding the “Trade Ally Network”.
 - Base case target in all states is 3rd quarter 2014, with an accelerated target of 4th quarter 2013
- Accelerate small-mid market business DSM acquisitions by contracting with third party administrators to facilitate greater acquisitions by increasing marketing, outreach, and management of comprehensive custom projects by 1st quarter 2014.
- Increase the reach and effectiveness of “express” or “typical” measure offerings by increasing qualifying measures, reviewing and realigning incentives, implementing a direct install feature for small commercial customers, and expanding the residential refrigerator and freezer recycling program to include commercial units.
 - Utah base case schedule is 1st quarter 2014 with an accelerated target of 3rd quarter 2013.
 - Washington base case schedule is 4th quarter 2014, with an accelerated target of 1st quarter 2014.
 - Wyoming, California, and Idaho base case schedule is 4th quarter 2014, with an accelerated target of 2nd quarter 2014.
- Increase the reach of behavioral DSM programs:
 - Evaluate and expand the residential behavioral pilot.
 - ◇ Utah base case schedule is 2nd quarter 2014, with an accelerated target of 4th quarter 2013.
 - Accelerate commercial behavioral pilot to the end of the first quarter 2014.
 - Expand residential programs system-wide pending evaluation results.
 - ◇ System-wide target is 3rd quarter 2015, with an accelerated target of 3rd quarter 2014.
- Increase acquisition of residential DSM resources:
 - Implement cost effective direct install options by the end of 2013.
 - Expand offering of “bundled” measure incentives by the end of 2013.
 - Increase qualifying measures by the end of 2013.
 - Review and realign incentives.
 - ◇ Utah schedule is 1st quarter 2014
 - ◇ Washington base case schedule is 2nd quarter 2014, with accelerated target of 1st quarter 2014.

- ◊ Wyoming, California, and Idaho base case schedule is 3rd quarter 2014, with an accelerated target of 2nd quarter 2014
- Accelerate acquisitions by expanding refrigerator and freezer recycling to incorporate retail appliance distributors and commercial units – 3rd quarter 2013.
- By the end of 2013, complete review of the impact of accelerated DSM on Oregon and the Energy Trust of Oregon, and re-contract in 2014 for appropriate funding as required.
- Include in the 2013 IRP Update Class 2 DSM decrement values based upon accelerated acquisition of DSM resources.
- Include in the 2014 conservation potential study an analysis testing assumptions in support of accelerating acquisition of cost-effective Class 2 DSM resources, and apply findings from this analysis into the development of candidate portfolios in the 2015 IRP.

- Provide twice yearly updates on the status of DSM IRP acquisition goals to the Commission in 2014 and 2015, including a summary of DSM acquisitions from large special contract customers. Summarize where efforts have deviated from previously agreed upon action items and report on progress toward specific DSM targets for all states other than Oregon.

- Include in the 2014 conservation potential study information specific to PacifiCorp's service territory for all states other than Oregon that quantifies how much Class 2 DSM programs can be accelerated and how much it will cost to accelerate acquisition.

- Include a PacifiCorp service area specific implementation plan as part of the 2015 IRP filing. At twice yearly updates to the Commission, provide a summary of savings potential, gaps and how PacifiCorp's specific implementation plan and programs are achieving the identified potential.

- In future IRPs, PacifiCorp will provide yearly Class 1 and Class 2 DSM acquisition targets in both GWh and MW for each year in the planning period, by state.

Coal Resource Actions

Action Item 8a. - Naughton Unit 3

- Continue permitting and development efforts in support of the Naughton Unit 3 natural gas conversion project. The permit application requesting operation on coal through year-end 2017 is currently under review by the Wyoming Department of Environmental Quality, Air Quality Division.
- Issue a request for proposal to procure gas transportation for the Naughton plant as required to support compliance with the conversion date that will be established during the permitting process.
- Issue an RFP for engineering, procurement, and construction of the Naughton Unit 3 natural gas retrofit as required to support compliance with the conversion date that will be established during the permitting process.
- Evaluate the Naughton Unit 3 investment decision in the 2015 IRP with updated analysis including the shutdown versus conversion options.

Action Item 8b. – Hunter Unit 1

The Commission does not acknowledge Action Item 8b to complete installation of the baghouse conversion and low NO_x burner compliance projects at Hunter 1 as required by the end of 2014 because the project is under construction and substantially complete and the Company failed to provide evidence explaining the circumstances that prevented its inclusion in previous IRPs

Action Item 8c. - Jim Bridger Units 3 and 4 TO BE DETERMINED

Action Item 8d. - Cholla Unit 4

Continue to evaluate alternative compliance strategies that will meet Regional Haze compliance obligations, related to the U.S. Environmental Protection Agency’s Federal Implementation Plan requirements to install SCR equipment at Cholla Unit 4. Provide an analysis of Cholla Unit 4 compliance alternatives in a special designated IRP Update within six months of the final order in LC 57 and well enough in advance to allow for all potential reasonable pollution control alternatives for Cholla to be adequately pursued.

Action Item 8e. – Craig and Hayden

Within three months of the Commission order in this docket PacifiCorp shall schedule a confidential technical workshop to review existing analysis on the planned Craig and Hayden environmental investments.

Action Item 8f. - Wyodak

For the 2015 IRP the following inter-temporal and fleet trade-off analysis related to the SCR requirement on Wyodak by 2019 will be used as a frame of reference:

	Inter-temporal Scenarios			
	EPA requirement	Time 1	Time 2	Time 3
Wyodak Plant Action	SCR Retrofit	SNCR Retrofit / early retirement	Gas Conversion	Retirement
Timeline	2019	2019 /2030	2022	2027

	Fleet Trade-Off Scenarios				
	EPA requirement	Fleet 1	Fleet 2	Fleet 3	Fleet 4
Wyodak	SCR Retrofit in 2019	No Action	No Action	No Action	No Action
Dave Johnston Units 1 & 2	No Action	Retirement in 2027	No Action	Gas Conversion in 2022	No Action
Dave Johnston Unit 4	No Action	No Action	Retirement in 2027	No Action	Gas Conversion in 2022

- The timing and options will be finalized with stakeholders at the workshops for the 2015 IRP.
- This analysis will include considerations for the necessity of Gateway West with reduced capacity in eastern Wyoming.
- Workshops will be held, including at least one with the Commissioners, to refine the list of specific fleet analyses to be performed in the IRP. Staff will bring final recommendations to the Commission at a Public Meeting and the Company and parties will have an opportunity to respond.

Action Item 8g. – Carbon Analysis

Prior to the end of 2014, the Company will work with Staff and stakeholders to explore options for how the Company plans to model and perform analysis in the 2015 IRP related to what is known about the requirements of Section 111(d).

Action Item 8h. – Screening Tool

As part of the 2015, 2017, and 2019 IRP, the Company shall provide an updated version of the confidential screening tool spreadsheet model that was provided to Staff and parties as part of the LC 52 2011 IRP Update.

Action Item 8i. – Reporting and Requirement for Future IRPs and IRP Updates

Beginning in the third quarter of 2014, PacifiCorp will appear before the Commission to provide quarterly updates on coal plan compliance requirements, legal proceedings, pollution control investments, and other major capital expenditures on its coal plants or transmission projects. PacifiCorp may provide a written report and need not appear if there are no significant changes between periods.

In future IRPs, PacifiCorp will provide:

- Timelines and key decision points for expected pollution control options and transmission investments; and
- Tables detailing major planned expenditures with estimated costs in each year for each plant or transmission project, under different modeled scenarios.

Transmission Actions

Action Item 9b. - Energy Gateway Permitting

Continue permitting Segments D,E, F, and H until PacifiCorp files its 2015 IRP, when SBT analyses for these segments may be performed.

Action Item 9c. - Sigurd to Red Butte 345 kilovolt Transmission Line

TO BE DETERMINED

REDACTED
Commissioner Savage's Bench Request Regarding Jim Bridger Analysis in
Dockets LC 57 and LC 58.
May 20, 2014

At the conclusion of the March 17, 2014 special public meeting regarding Idaho Power's 2013 Integrated Resource Plan, Commissioner Savage requested a comparison of Staff's analysis of the investments at Jim Bridger units 3 and 4 (JB 3 and 4) in the Idaho Power IRP and Staff's analysis of the same investments in PacifiCorp's 2013 Integrated Resource Plan. This memo provides the Staff response to that request.

The analysis of the JB 3 and 4 selective catalytic reduction (SCR) investment performed for Idaho Power in LC 58 is fundamentally different from the analysis for PacifiCorp in LC 57 for two primary reasons. First, when analyzing the alternative of replacing the units with a combined cycle combustion turbine (CCCT), Idaho Power assumed MW for MW replacement at the same point in time when the units are retired. By contract, PacifiCorp's System Optimizer selected the timing, location, size, and technology of the replacement resource or resources. Second, input assumptions for natural gas prices and CO₂ costs differed. Staff did not require Idaho Power to run a scenario using PacifiCorp's methodology and inputs.

Question 1: Was the methodology used the same?

No. The methodologies used by PacifiCorp and Idaho Power to analyze the SCR investments at JB 3 and 4 were not the same.

Idaho Power Analysis

Idaho Power conducted two sets of analyses. The first set evaluated the scheduled installation of SCR at unit 3 in 2015 and at unit 4 in 2016. The base case present value revenue requirement of installing SCR and operating these units to the end of their useful lives is [REDACTED] billion. Idaho Power considered two alternative cases. The first alternative case called for shutting down unit 3 at the end of 2015 and unit 4 at the end of 2016 and replacing these units with equivalently sized natural gas-fired CCCTs at the beginning of 2016 and 2017, respectively. The present value revenue requirement for this replacement case is [REDACTED] billion. The difference in present value revenue requirement (PVRR) between the base case and replacement case is [REDACTED] million.

The second alternative case called for converting unit 3 to a natural gas-fired unit at the end of 2015 and converting unit 4 to a natural gas-fired unit at the end of 2016. The

present value revenue requirement for this conversion case is [REDACTED] billion. The difference in PVRR between the base case and conversion case is [REDACTED] million.

The second set of analyses evaluated the delayed installation of SCR at unit 3 in 2020 and at unit 4 in 2021. The base case present value revenue requirement of installing SCR and operating these units to the end of their useful lives is [REDACTED] billion. The replacement case called for shutting down unit 3 at the end of 2020 and unit 4 at the end of 2021 and replacing these units with equivalently sized natural gas-fired CCCTs at the beginning of 2021 and 2022, respectively. The present value revenue requirement for this replacement case is [REDACTED] billion. The difference in PVRR between the base case and replacement case is [REDACTED] million. The conversion case called for converting unit 3 to a natural gas-fired unit at the end of 2020 and converting unit 4 to a natural gas-fired unit at the end of 2021. The present value revenue requirement for this conversion case is [REDACTED] billion. The difference in PVRR between the base case and conversion case is [REDACTED] million.

PacifiCorp Analysis

PacifiCorp conducted two sets of analyses. The first set evaluated the scheduled installation of SCR at unit 3 in 2015 and at unit 4 in 2016. The base case present value revenue requirement of installing SCR and operating these units to the end of their useful lives is [REDACTED] billion. PacifiCorp considered one alternative case. The alternative case called for a series of major resource actions relative to the base case resource portfolio:

1. Converting unit 3 to a natural gas-fired unit at the end of 2015 and converting unit 4 to a natural gas-fired unit at the end of 2016.
2. Delaying the shutdown of 387 MW Cholla unit 1 from the end of 2024 to the end of 2025.
3. Delaying the 661 MW natural gas-fired CCCT scheduled for the beginning of 2024 to the beginning of 2025.
4. Delaying the 181 MW natural gas-fired single cycle combustion turbine (SCCT) scheduled for the beginning of 2027 to the beginning of 2028.
5. Replacing the 423 MW natural gas-fired CCCT scheduled for the beginning of 2028 with a 181 MW natural gas-fired SCCT at the beginning of 2029, a 181 MW natural gas-fired CCCT at the beginning of 2030, and a 411 MW natural gas-fired CCCT at the beginning of 2032.

The present value revenue requirement for this conversion case is [REDACTED] billion. The difference in PVRR between the base case and this conversion case is [REDACTED] million.

PacifiCorp conducted similar gas conversion analyses in its Certificate of Public Convenience and Necessity (CPCN) cases in Wyoming and Utah using variations in natural gas and carbon dioxide prices. The base case difference in PVRR was [REDACTED] million. The differences in PVRR ranged from [REDACTED] million to [REDACTED] million across the eight sensitivity cases.

The second set of analyses evaluated early shutdown of unit 3 in 2020 and unit 4 in 2021. The base case present value revenue requirement of installing SCR and operating these units to the end of their useful lives is [REDACTED] billion. PacifiCorp considered one alternative case. The alternative case called for a series of major resource actions relative to the base case resource portfolio:

1. Advancing the 661 MW natural gas-fired CCCT scheduled for the beginning of 2024 to the beginning of 2022.
2. Delaying the shutdown of 387 MW Cholla unit 1 from the end of 2024 to the end of 2025.
3. Advancing the 181 MW natural gas-fired SCCT scheduled for the beginning of 2027 to the beginning of 2025.
4. Advancing the 423 MW natural gas-fired CCCT scheduled for the beginning of 2028 to the beginning of 2025.
5. Advancing the 661 MW natural gas-fired CCCT scheduled for the beginning of 2024 to the beginning of 2025.
6. Adding a 181 MW natural gas-fired SCCT in 2028.
7. Replacing the 661 MW natural gas-fired CCCT scheduled for the beginning of 2030 with an 822 MW natural gas-fired CCCT.

The present value revenue requirement for this early shutdown case is [REDACTED] billion. The difference in PVRR between the base case and this shutdown case is [REDACTED] million. In addition to the two analyses described above, for PacifiCorp Staff also requested additional analyses using a later retirement date and lower gas prices.

Comparison

A comparison or reconciliation of the results from the Idaho Power and PacifiCorp analyses is difficult. The Idaho Power analysis isolates the impact of the primary resource decision. For example the difference between installing SCR and operating the Bridger units to the end of their useful lives and replacing the units with equivalently sized natural gas-fired CCCTs. The Idaho Power analysis does not consider secondary portfolio impacts; all other changes are assumed to be held constant. The PacifiCorp analysis considers both the primary impact and the secondary impacts that spread

throughout the 20-year planning period. Staff was unable to determine how much each change to the resource portfolio contributed to the overall difference in PVRR.

Question 2: Did Staff coordinate across the two IRPs?

Yes, Staff coordinated across IRPs on analyses and results associated with Bridger 3 and 4.

Question 3: Did Staff have PacifiCorp and Idaho Power run the exact same scenario?

No, Staff did not have Idaho Power run the exact same scenarios that we had PacifiCorp run.

Question 4: What were the differences in the tools, inputs and results?

Tables 1 and 2 show the results of the Idaho Power and PacifiCorp analyses of the investments at JB 3 and 4 using base case carbon and gas prices.¹ Because of the differences in the analysis described in the Staff Response to Question 1, the results are not directly comparable.

Table 1. Results of Idaho Power Analysis of Investments at Jim Bridger Units 3 and 4.

	PVRR	PVRR Difference
	(in Billion \$)	(in Million \$)
Scheduled SCR Installation 2015/2016		
Base Case		
Conversion Case		
Replacement Case		
Delayed SCR Installation 2020/2021		
Base Case		
Conversion Case		
Replacement Case		

¹ The results of the additional model runs requested by Staff of PacifiCorp are not shown in Table 2.

Table 2. Results of PacifiCorp Analysis of Investments at Jim Bridger Units 3 and 4

	PVRR	PVRR
	(in Billion \$)	Difference
		(in Million \$)
Scheduled SCR Installation 2015/2016		
Base Case		
Conversion Case		
Early Retirement 2020/2021		
Base Case		
Replacement Case		

Two other key differences between the Idaho Power analysis and the PacifiCorp analysis are differences in input assumptions for natural gas prices and carbon dioxide regulation prices. Figure 1 shows a comparison of the natural gas prices used in each company's analysis. Figure 2 shows a comparison of the carbon dioxide regulation prices used in each company's analysis.

Figure 1. Idaho Power and PacifiCorp Natural Gas Price Forecasts

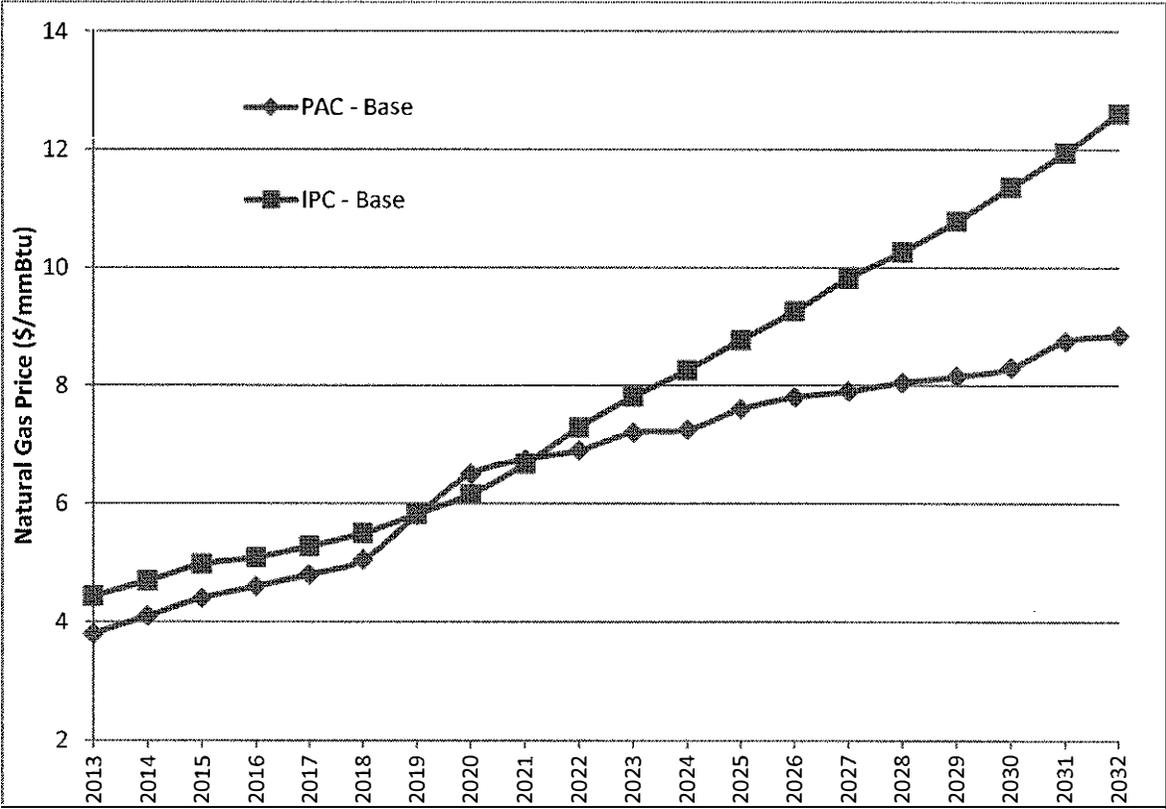


Figure 2. Idaho Power and PacifiCorp CO₂ Regulation Price Forecasts

