BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of PacifiCorp's 2011 Integrated Resource Plan	Docket No. 11-2035-01

COMMENTS OF WESTERN RESOURCE ADVOCATES

September 7, 2011

Western Resource Advocates (WRA) appreciates the opportunity to provide input to the Public Service Commission of Utah (Commission) regarding whether to acknowledge IRP 2011, and respectfully submits the following comments, supporting analysis, and recommendation.

I. SUMMARY AND RECOMMENDATION

IRP 2011 does not appear to be in compliance with the Integrated Resource Planning Standards and Guidelines Order in Docket No. 90-2035-01 issued June 18 (Standards and Guidelines).[1] PacifiCorp developed and evaluated portfolios that are substantially similar, limited "public input and information exchange"[2] during the development of the plan and employed a flawed evaluation of risk and uncertainty. The result is a plan that is not technically supportable. Therefore, WRA believes IRP 2011 cannot be acknowledged as it is.

[1] Public Service Commission of Utah, In the Matter of Analysis of an Integrated Resource Plan for PacifiCorp, Report and Order on Standards and Guidelines, Docket No. 90-2035-01, June 18, 1992.

[2] Ibid, p. 41-42.

Because the IRP is deficient, WRA recommends the Commission pursue one of two paths forward. The Commission could, as it has done in the past, issue an order not acknowledging the IRP with clear directives for improvement in the next planning cycle. This approach seems reasonable when no near-term capital investments or requests for cost recovery are expected. However, given the significant investment the Company is undertaking in the near-term, WRA believes the public may be better served by the Commission taking a more "active-directive role" as allowed for and anticipated by the Standards and Guidelines.[3]

If the Commission determines a more active directive role is warranted, WRA recommends the Commission issue an interim order directing PacifiCorp to address the shortcomings of this IRP with a timeline for correcting the deficiencies and a procedural schedule that could include a hearing before issuing a final order. In the alternative, WRA recommends the Commission issue an order not acknowledging IRP 2011.

II. IRP STANDARDS AND GUIDELINES

WRA identifies the following Standards and Guidelines with which IRP 2011 does not comply. In this section we identify the Procedural Issue, Standard, or Guideline and provide a brief explanation of Commission intent.

- <u>Procedural Issue Five</u>

Consideration of environmental externalities and attendant costs must be included in the integrated planning analysis.

The Commission's discussion of procedural issue number five is informative. The following excerpt encapsulates the more extensive discussion.

[3] "The Commission will review the Plan for adherence to the principles stated herein, and will judge the merit and applicability of the public comment. If the Plan needs further work the Commission will return it to the Company with comments and suggestions for change. This process should lead more quickly to the Commission's acknowledgement of an acceptable Integrated Resource Plan." Ibid, p. 45.

> "The Commission finds that prudent business planning must evaluate risk and uncertainty. Such evaluations will weigh the consequences of such risk and uncertainty with the costs of strategies that insulate the Company from such risks. The Commission finds that future internalization of environmental costs is a risk that is currently facing the electric utility industry…The Commission concludes that requiring the Company to conduct an analysis of the risks associated with future internalization of environmental costs is appropriate at this time."[4]

- Procedural Issue Nine

The Company's Strategic Business Plan must be directly related to its Integrated Resource Plan.

In its discussion of this issue the Commission stated:

> "The Commission finds that consistency between the Company's strategic business plan and its IRP is necessary to ensure that ratepayers receive the benefits from IRP." [5]

- Standard and Guideline One—Definition of Integrated Resource Planning

Integrated resource planning is a utility planning process which evaluates all known resources on a consistent and comparable basis, in order to meet current and future customer electric energy services needs at the lowest total cost to the utility and its customers, and in a manner consistent with the long-run public interest. The process should result in the selection of the optimal set of resources given the expected combination of costs, risk and uncertainty.

The Commission discusses how environmental considerations enter into the definition of integrated resource planning:

> "The Commission's directive to the Company to consider the long-run public interest requires consideration of environmental ramifications of the production and consumption of electrical energy services. All other things being equal, the Company will be expected to pursue resource acquisitions that minimize adverse environmental impacts as a method of reducing risk. The Commission has stated that the IRP process should select resources that yield the optimal combination of costs and risks. The risk of future internalization of environmental costs must be analyzed by the Company and such risk assessment must be incorporated in the Company's decision making and final choice of resource acquired."

[4] Ibid. p. 12.
[5] Ibid. p. 17.

• Standard and Guideline Three

The integrated resource plan will be developed in consultation with the Commission, its staff, the Division of Public Utilities, the Committee [Office] of Consumer Services, appropriate Utah state agencies and interested parties. PacifiCorp will provide ample opportunity for public input and information exchange during the development of its Plan.

This directive stands on its own. No further explanation of its meaning or intent was provided in the Standards and Guidelines.

III. DISCUSSION

IRP 2011 contains two volumes of information and represents countless hours of effort by PacifiCorp, commissions and their staffs, state agencies, consumer and industrial organizations, environmental organizations, and other interested stakeholder groups across five of PacifiCorp's six-state territory. The discussion in the chapter describing the planning environment is thoughtful, and the models used to conduct the analysis sophisticated. Unfortunately, despite the thoughtful discussion and the potential of the IRP modeling tools to provide broad insight into the real cost/risk tradeoffs arising from the significant uncertainties facing the industry today, the primary shortcoming of IRP 2011 is the flawed evaluation of those risks and uncertainties. These flaws are both methodological and assumption driven. WRA believes these errors could have been avoided had the Company complied with the Standards and Guidelines noted above, responded more than superficially to past Commission orders, and been willing to conduct an open and responsive public input process.

1. PacifiCorp Failed to Evaluate Earlier Retirement of Coal-Fired Generation as an Alternative to Environmental Retrofit Investments

A. *Costs to comply with final, proposed, and expected EPA regulations are expected to be substantial.*

As was well documented in testimony submitted this past year in Docket No. 11-035-124, PacifiCorp has recently spent substantial sums upgrading and retrofitting many of the units in its coal fleet in order to comply with the Regional Haze Rule. These expenditures may be but the tip of the iceberg needed for the Company to comply with the Regional Haze Rule and other proposed and expected Environmental Protection Agency (EPA) regulations promulgated under the Clean Air Act, Clean Water Act and Resource Conservation and Recovery Act.

PacifiCorp rate case testimony detailed some of the past and expected costs needed to comply with just the Regional Haze Rule.[6] Between 2005 and 2010, PacifiCorp spent more than $1.2 billion in capital dollars. The testimony indicated that the total costs for all projects that the Company committed to will exceed $2.7 billion by the end of 2022. Total costs, which include capital, O&M, and other costs during the period 2005 through 2023 are expected to exceed $4.2 billion, and by 2023 annual O&M costs will have reached $360 million.

These projected costs were developed assuming Selective Catalytic Reduction (SCR) was installed at five of PacifiCorp's coal-fired facilities. However, PacifiCorp provided testimony to the Senate Committee on Environment and Public Works on June 15, 2011 indicating that EPA Region 8 may require an additional nine units to have SCR installed at an additional $1.7 billion to $2 billion in costs.[7]

This same testimony to the Senate Committee provides information regarding the potential impacts to PacifiCorp from the proposed Utility Hazardous Air Pollutants (HAPS) Maximum Achievable Control Technology (MACT) Rule; Cooling Water Intake Structure Rule;

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[6] See Exhibit RMP_(CAT-1) attached to the Direct Testimony of Chad A. Teply in Docket No. 10-035-124.

[7] Testimony of Cathy S. Woollums, Senior Vice President and Chief Environmental Counsel, MidAmerican Energy Holdings Company, to the Committee on Environment and Public Works, United States Senate, June 15, 2011.

Steam Electric Effluent Guidelines; and Coal Combustion Residuals (CCR or Coal Ash) which could impact existing resource availability within the first five years of the planning period. PacifiCorp estimates that to meet emissions reductions anticipated by the new air regulations, the Company must complete environmental retrofit projects no later than fall of 2014 at a cost of approximately $1.26 billion. According to PacifiCorp, the effect of HAPS alone might be to idle Carbon Units 1 and 2 and Dave Johnston Units 1 & 2 or require conversion of those units to natural gas.[8] PacifiCorp testified that the costs associated with compliance with the Steam Electric Effluent Guidelines are "expected to be high….Wastewater treatment systems generally range from tens of millions of dollars for a small facility, to a hundred million or more for a large facility."[9] With respect to CCR, PacifiCorp testified "the regulation of CCR under either of the EPA's primary options would have a significant impact on the methods that PacifiCorp typically employs to mange its ash. Currently, Carbon, Hunter, and Huntington do not have any wet surface impoundments at the facilities. The remaining coal-fueled units, however, sluice ash and scrubber waste to on-site surface impoundments. In addition, if CCR is ultimately designated as a hazardous waste, the beneficial use market could evaporate and eliminate the over $3.5 million PacifiCorp receives each year on average from this commodity. The loss of the beneficial use market would also increase disposal costs and dramatically increase the rate at which monofills are filled."[10]

Thus, PacifiCorp's coal fleet will require on-going and substantial investment in order to comply with these environmental regulations. These potential costs represent the type of "uncertainty" that integrated resource planning is intended to evaluate. A comprehensive

[8] Ibid., page 12.

[9] Ibid., page 13-14.

[10] Ibid., page 14.

analysis that evaluates, through cost ranges, potential cost impacts, to individual units on a case-by-case basis, including rising and increasingly volatile coal prices,[11] against alternatives is clearly necessary in order to comply with requirements of the Standards and Guidelines.

B. *Coal retirement studies did not evaluate earlier retirement as an alternative to ongoing investment.*

In light of the known and expected cost pressures on coal-fired generation, and in response to PacifiCorp seeking input in June of 2010 regarding the issues that were important to address in the 2011 IRP, public input participants identified the need to evaluate earlier retirement of coal units as an alternative to ongoing investment. PacifiCorp agreed to conduct the coal retirement studies and to provide stochastic analysis of the results.

While PacifiCorp initially targeted providing public input participants with completed results in November of 2010, PacifiCorp did not release the study methodology or results until the IRP 2011 Draft was released March 7, 2011. No explanation was provided.[12]

Unfortunately, the coal retirement studies do not evaluate what they were intended to evaluate – earlier retirement as an alternative to ongoing investment. First, the modeling did not allow pollution control expenditures before 2017 to be avoided. As the discussion above makes clear, the majority of expenditures needed to meet the Regional Haze Rule will be sunk before 2017. Second, by assuming pollution control investments between 2012 and 2017 are sunk costs and by further assuming that the incremental fixed O&M and capital from these investments must be recovered before the unit can be retired, these pollution control investments could

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[11] In recent years, coal prices have been rising and becoming increasingly volatile in response to increasingly expensive mining operations, increasing foreign demand, and retiring long-term contracts. This trend is expected to continue

[12] The effect was to circumvent public participants' opportunity to request the modeling be redone and assured that no comprehensive studies were available for use in the Wyoming or Utah rate cases.

actually extend the lives of the plants in the study, a seemingly perverse result. Finally, PacifiCorp's treatment of coal fuel costs for this study contributed to this effect by lowering the modeled operating costs and increasing the modeled fixed O&M, both of which would lead to operating the plants longer.[13]

By failing to analyze retirement as an alternative to ongoing incremental investment, the Company did not analyze the "risk of future internalization of environmental costs" as required by the Commission in Procedural Guideline Five and in the Definition of Integrated Resource Planning.

C. *Lack of analysis calls into question the underlying load and resource balance, and, therefore, the type, timing, and location of new generation sources and evaluation of Energy Gateway segments.*

Failure to adequately assess the potential for accelerated retirement on a unit-by-unit basis calls into question the IRP results. As previously discussed, PacifiCorp identified in Senate testimony four units, Carbon 1 and 2, and Dave Johnston 1 & 2 that might be candidates for early closure from just new air emission rules. If these four resources or any others were to be switched to burning natural gas, idled, or closed in the 2014 time period, the load and resource balance and/or existing fuel mix could be significantly different from the one used to develop the 2011 Plan. Equally, significant, early retirement of coal facilities would free up transmission capacity. Together, these could significantly alter the type timing and location of new generation

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[13] WRA had noticed that unlike past IRPs, coal price forecasts had not been provided as part of the IRP report, so WRA requested these forecasts through discovery. The discovery response was marked confidential and the requested information was expressed in $/MMbtu. In order to be able to compare the prices with information provided in past IRPs, WRA again requested the information and asked that it be expressed in $/ton. PacifiCorp responded with Attachment WRA Confidential 2.1. Footnote One to Attachment WRA Confidential 2.1 in Docket No. 11-2035-01 states: "Unlike the Company's general rate cases or prior IRPs, the 2011 IRP coal prices reflect cash costs only. The Company's share of mine investment and capital recovery for the affiliated mines … are included in the fixed operation and maintenance of the coal plant. Prior to the 2011 IRP, coal prices included cash costs and mine capital recovery. The change to the IRP modeling of coal fuel prices was done to facilitate the analysis of the coal utilization studies."

and could change the analysis of need for Energy Gateway Segments. For example if Dave Johnston 1 and 2 were to stop producing electricity altogether, more capacity could become available from Wind Star to Populus. Wyoming wind might be accessible earlier than the currently assumed date of 2018, and/or the analysis of needed transmission might change.

D. Linkage to Standards and Guidelines

Failure to examine earlier retirement as an alternative to ongoing investment results in an IRP that did not adequately evaluate the risk and uncertainties facing the Company. In particular, the risk of "future internalization of external costs" was not examined. As a result the IRP does not comply with the following Commission directives:

- Procedural Issue 5: "*Consideration of environmental externalities and attendant costs must be included in the integrated planning analysis*." (Emphasis added)
- Definition: "Integrated resource planning is a utility planning process which evaluates all known resources on a consistent and comparable basis, in order to meet current and future customer electric energy services needs a the lowest total cost to the utility and its customers, and *in a manner consistent with the long-run public interest*. The process should result in the *selection of the optimal set of resources given the expected combination of costs, risk and uncertainty*." (Emphasis added)

By not examining the issue public participants had requested be examined through the "coal retirement studies"—retirement versus ongoing investment—and by not releasing the study results until the draft was published, thereby effectively circumventing public response and input, the public process used does not comply with Standard and Guideline 3 regarding public participation.

- The integrated resource plan will be developed in *consultation* with the Commission, its staff, the Division of Public Utilities, the Committee [Office] of Consumer Services, appropriate Utah state agencies and interested parties. *PacifiCorp will provide ample opportunity for public input and information exchange during the development of its Plan.* (Emphasis added)

2. PacifiCorp Conducted a Flawed Evaluation of Risk and Uncertainty

The greatest risks facing the industry today continue to be the potential regulation of carbon dioxide emissions and the risk of volatile fuel prices (natural gas and coal) and purchased power prices.

A. Evaluation of CO2 risk

The modeling of CO2 risk for this IRP cycle does not capture the potential range of CO2 outcomes. A "High" CO2 cost was used for portfolio development in only three cases[14] and the "High" played no role in PacifiCorp's evaluation of the risk of CO2 regulation. Instead PacifiCorp conducted the stochastic analysis using a "Low-to-Very-High" CO2 forecast. Unfortunately the "High" part of the Low-to-Very-High cost forecast does not kick-in until late in the 20-year planning period when such costs are well discounted by the model. As can be seen in Table 1 below, the Low-to-Very High CO2 forecast does not exceed the Medium until 2024. It does not exceed the High until 2028.

[14] Seven cases were developed using the Low-to-Very-High CO2 cost assumption.

Table 1 also portrays the Averaged CO2 cost that PacifiCorp used to compare the cost/risk performance of the analyzed portfolios. That these costs are unreasonably low can be understood by comparing them to the shadow emissions costs that were generated by System Optimizer for the four portfolios created estimating hard limits on emissions.[15] If policy makers were to decide to address emissions in a manner necessary to meet climate objectives, CO2 costs would exceed the range of values PacifiCorp evaluated in this IRP.

Table 1. CO2 Emissions Cost and Emission Shadow Costs ($ / Short Ton)

Year	None	Medium	Low to Very High	Average Used for Cost/Risk Tradeoff	High	Base Cap Low Gas Case15 Shadow Price	Base Cap Med Gas Case16 Shadow Price	Base Cap High Gas Case17 Shadow Price	HB 3543 Med Gas Case18 Shadow Price
2015	-	19	12	10	25	-	-	-	37
2016	-	20	13	11	27	10	8	1	39
2017	-	21	13	11	29	11	4	16	35
2018	-	22	14	12	31	14	30	34	37
2019	-	23	15	13	33	15	34	39	40
2020	-	24	15	13	35	17	36	50	43
2021	-	25	18	15	37	21	40	64	47
2022	-	27	22	16	40	24	43	71	55
2023	-	28	26	18	43	28	50	78	70
2024	-	29	31	20	45	34	57	85	75
2025	-	31	38	23	49	38	60	91	75
2026	-	32	54	29	52	47	64	94	77
2027	-	34	54	29	55	47	62	95	73
2028	-	35	65	33	59	51	71	108	83
2029	-	37	78	38	63	63	75	114	101
2030	-	39	93	44	68	47	61	78	78

[15] CO2 shadow prices were estimated for Cases 15, 16, 17, and 18. Cases 15-17 were created using a CO2 cap of 15% below 2005 emissions levels by 2020 and 80% by 2050, with three different natural gas prices: low, medium, and high. The fourth set of shadow prices was developed using Case 18. Case 18 was created with the assumption of a hard emissions cap of 10 percent below 1990 levels by 2020 and 80% below by 2050 with a medium natural gas price.

B. Cost/risk tradeoff evaluation

Background

A difficulty for utilities as they plan for the future is the historic existence of a "cost/risk tradeoff." Resources with lower relative capital cost, such as natural gas-fired resources, or short-term market purchases, come with "risky" operating costs. The risk of these resources is that future costs of natural gas or market purchases may be higher than forecast when the decision to pursue them was made. Renewable resources such as wind tend to have higher capital costs, and are, therefore, more costly initially, but once these investments are made, the operating costs are low and fuel is free. And, so historically, resource selection faced a cost/risk-tradeoff. Higher cost is traded for lower risk; lower cost comes with a higher risk.

Which path to pursue is ultimately a policy decision and depends on an individual's or organization's risk and rate impact tolerance. For PacifiCorp, managing differences in these tolerances across its states has been a challenge with Utah constituents consistently demonstrating a lower tolerance for market risk than its Oregon groups. Within Utah, organizations like WRA and UCE have used IRP results to demonstrate the risk mitigating benefits of energy efficiency and renewables in order to advocate for levels of these resources that PacifiCorp has been unwilling to pursue.

PacifiCorp's modeling of risk in this planning cycle removes the traditional cost/risk tradeoff and, thereby, the demonstrated risk-mitigating benefits of renewable and energy efficiency resources. PacifiCorp produced results that appear to demonstrate that resources, traditionally thought to be risky, are, in fact, low cost *and* low risk, and that portfolios traditionally thought to be risk-mitigating, are, in fact, risky. Indeed, this is what PacifiCorp concludes. PacifiCorp repeats on pages 213, 214, and 215 of Volume 1, that the results of the risk analysis demonstrate that the best performing portfolios are more reliant on gas, distributed generation, and Front Office Transactions. This result defies common sense and reverses the results of risk modeling in all past IRP cycles. Despite the dramatic reversal in results, no explanation is provided in the document. WRA believes PacifiCorp should have, and should yet, explain how a trade-off between cost and risk has become a linear relationship between cost and risk.

In the remainder of this section WRA examines factors that may have contributed to, or caused, the fundamental change in relationship between cost and risk.

Stochastic Modeling

The primary risk analyzed with stochastic modeling is market and fuel price risk. This risk occurs when actual prices are higher than expected, actual resource need is higher than expected, or some combination of both. For PacifiCorp, resource need can be higher than expected if load forecasts underestimate growth, summer weather is hotter than expected, existing plants undergo unexpected outages, or hydro production is less than expected. In any of these situations, PacifiCorp will have to run its existing resources harder—burn more fuel—or purchase more power on the market. If fuel and market prices are higher than forecast when need is greater, the combination of an unexpected need with high prices can result in actual expenditures significantly exceeding forecasts at the time resource planning was undertaken.

The purpose of stochastic modeling is to estimate this risk. For this IRP cycle, PacifiCorp limited this risk by removing long-run load variability, reducing short-run load variability, and not modeling unexpected outages at its existing thermal facilities. PacifiCorp does not identify changes in any other modeling parameters for this planning cycle.

Load Variation

This IRP represents a significant departure from how PacifiCorp previously evaluated the risk that loads will differ from forecasts. Without consulting with public participants, PacifiCorp removed the long-run load variability parameter from the modeling. Public participants became aware of the change upon reviewing the draft document. Given the significant effect this change has had on the modeling results, and given the Utah Commission's concern expressed in past orders regarding PacifiCorp modeling of load growth risk, PacifiCorp's apparent unwillingness to consult with public participants on this issue is surprising. In addition, PacifiCorp re-estimated the short-run load parameters using 3 years of data rather than 4. The short-run parameters appear lower on average than the previous short-run load parameters. As a result, load deviations from a base forecast will be smaller than they have been in the past, reducing the measure of risk.

Forced Outages

Unexpected forced outages at PacifiCorp's existing thermal plants were not modeled as a potential risk.[16] PacifiCorp states, "for existing thermal units, planned maintenance schedules are used." The associated footnote states "stochastic simulation of existing thermal unit availability is undesirable because it introduces cost variability unassociated with the evaluation of new resources, which confounds comparative portfolio analysis."[17] WRA believes this statement warrants public vetting. It appears to WRA that planning for an integrated system

[16] The decision to cease modeling forced outages at existing units was made in a previous IRP cycle. WRA does not know whether the decision was made with public input.

[17] PacifiCorp, 2011 Integrated Resource Plan, Volume 1, March 31, 2011, p. 183

requires understanding the underlying risk of the existing system to appropriately add resources that can help mitigate that risk.

Inconsistent Base Assumptions for Stochastic Runs Appear Likely

Based on observation, it appears that PacifiCorp may not have used common base forecast assumptions for its stochastic runs.[18] PacifiCorp appears to have used the underlying forecast assumptions that were the basis of the portfolio creation as the base forecast for the stochastic modeling. Thus, portfolios that were built assuming a low natural gas price future were risk tested allowing for variability only around a low natural gas price forecast, and portfolios that were created using a high natural gas price future were risk tested allowing price fluctuations only around a high gas price future. If PacifiCorp indeed modeled stochastic risk using the same assumptions that were used to develop the portfolio, the disappearance of the cost/risk trade-off would be fully explained.

WRA reached this conclusion by examining Figure 8.10 on page 216 of Volume 1. Of the ten portfolio cases clustered around an expected cost (stochastic mean) of $32.5 billion, half were created using a low natural gas price assumption. The other five were created using a medium natural gas assumption. Of the six cases clustered around an expected cost (stochastic mean) of $34 billion, but displaying the same range of upper-tail risk as the portfolios developed using the low natural gas price, five were created assuming high natural gas prices.

If these observations are correct, the risk analysis is fundamentally flawed. If these observations are not correct, an explanation for the highly unusual results that was not provided in the IRP document is warranted. We look forward to PacifiCorp's Reply Comments.

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[18] We found no documentation relating to the choice of low, medium, or high, price forecasts as a base for the stochastic modeling for this IRP.

Cost Risk Scatter Plots

The cost/risk performance of the portfolios subjected to stochastic analysis is displayed in scatter plots on pages 134-137 of Volume II. The graphics indicate that Cases 17 and 18 developed using a hard CO2 cap are much costlier and much riskier than any other portfolio evaluated. However, an examination of the Present Value Revenue Requirement (PVRR) cost components reveal that capital cost, not operating cost, is the primary driver of differences between the portfolios. Differences in capital cost do not reflect differences in risk since for the most part capital costs tend to be known at the time a resource is acquired. It is the cost of operation over time that is unknown. So risk is measured by variable cost.

Tables E.9-E.11 on pages 146-148 of Volume II display the PVRR cost components of the stochastic mean for the core cases assuming a medium CO2 price.[19] Cases 17 and 18, the apparently riskiest cases, can be compared with Case 3, the Portfolio identified as best performing.[20]

Of the three portfolios, Case 17 has the lowest total variable cost ($27.9 billion versus $28.9 billion). Case 18 and Case 3 have the same total variable cost of $28.9 billion. Case 3 has the lowest capital cost: $5.95 billion. Case 18 has a capital cost of $6.85 billion, and Case 17 has the highest capital cost: $10.1 billion

Significantly within the variable cost component, both Case 17 and Case 18 have lower Fuel & O&M expense, and both have lower emissions cost. Cases 3, 17, and 18 are closely

[19] Given the positive and somewhat linear relationship of cost/risk outcomes for this IRP, where cost and risk appear to increase and decrease together, using the stochastic mean, while less than ideal, appears acceptable. Ideally, this assessment would be undertaken using PVRR detail for the upper tail risk.

[20] Cases 17 and 18 were chosen as comparators because PacifiCorp identified them as having outlying PVRRs and were not included in the cost/risk graphics displayed in Volume 1. Both were developed using hard carbon dioxide caps. In addition, Case 17 is worth evaluating because it adds the most wind of all the portfolios.

equivalent in Front Office Transactions. Case 17 and Case 18 have slightly more DSM expense. Case 17 has more renewables than Case 3; Case 18 has less. Both Case 17 and 18 have lower system sales and higher system purchases than Case 3. Energy not Served is equivalent.

PacifiCorp's unexplained conclusion that portfolios that performed best in an analysis of risk are more reliant on gas, distributed generation, and Front Office Transactions appears incorrect.[21] It appears that capital costs, not variable costs (risk), drive these results.

C. Linkage to Standards and Guidelines

The analysis of statistical risk appears flawed in this IRP cycle and the range of potential CO2 outcomes was not adequately assessed. Without an adequate evaluation of risk and uncertainty, the IRP is not in compliance with Utah's Standards and Guidelines. The process could not have "resulted in the selection of the optimal set of resources given the expected combination of costs, risk and uncertainty."

3. Case Development

A shortcoming of the entire planning exercise in this IRP cycle is the lack of real variation in the resource mix over the planning period. The core case portfolios produced for this IRP are substantially similar and differ relatively little in cost/risk metrics.

This outcome is driven in three ways. First, few resource options were available to System Optimizer over the first 10 years of the planning period. Second, Business Plan assumptions drive the majority of planning study cases. Third, only three of the cases used a "High" CO2 cost, but never with the assumption that the Production Tax Credit (PTC) would be

[21] The conclusion that resources heavy in natural gas and front office transactions are less risky than portfolios that are heavier in DSM and renewables is contrary to common sense and to years of past study results. WRA questions why PacifiCorp would not at least attempt to explain such an unusual conclusion.

extended beyond 2014. The only cases that assumed extension of the PTC were combined with the “Low-to-Very High” CO2 cost assumption. As discussed previously, the Low-to-Very High CO2 assumption affects planning similarly to a “Low” CO2 cost assumption. The Very-High assumptions in the Low-to-Very High occur in the last two years of the planning period.

As a result of the above, the primary differences in the resources mixes of the portfolio cases are in the timing and size of natural gas and market resources over the first part of the planning period. Renewable resources are not made available to the model until 2018 and then the wind is constrained to additions of 200 MW per year.

WRA is concerned that PacifiCorp has intentionally or unintentionally misunderstood the Commission directive regarding the relationship of the Company’s Strategic Plan to its Integrated Resource Plan. The Commission makes clear in the Standards and Guidelines and in later orders pertaining to this issue that the purpose of this directive is to assure that the public benefits from integrated resource planning—in other words, to assure that IRP is not just a regulatory exercise with no real application to resource acquisition.

The benefit to the public of conducting integrated resource planning is to examine how robust a resource acquisition strategy will be in protecting the Company and its customers from cost consequences if the future does not unfold as expected at the time the planning is conducted.

Imposing a business planning view of the future on core case development may provide supporting results for what the Company believes is the way forward, but the evaluation of the cost consequence if the Company is incorrect is limited. The core case development cases did not provide enough variation in resources across the portfolios to evaluate the benefit or risk of substantially different resource portfolios, assuming the evaluation of risk had not been undermined by a positive relationship between cost and risk.

4. Modeling Assumptions Limit Wind Additions

Table 8.1 provides total portfolio cumulative capacity additions by case and resource type across the 20-year planning period. The last three columns report the minimum, the maximum and the average. On average, wind resources added to the core case portfolios over the 20-year planning period average under 700 MW.

In part, the lower levels of wind in IRP 2011's core case portfolios as compared with past IRPs reflect the lower natural gas and market price assumptions and the lower CO2 price assumptions used in this planning cycle.

However, wind was further handicapped with assumptions that specifically limit wind resource additions: high turbine costs, an excessive wind integration cost, removal of the $5/MWh Renewable Energy Credit (REC) revenue credit, and expiration of the PTC during the planning period. Significantly, Wyoming wind is assumed to be unavailable until 2018 while wind resources on the west side of the system are limited to 200 MW total. Finally System Optimizer is allowed to add only 200 MW per year except in the CO2 hard cap cases.

Some of these issues have already been well documented by comments to the Commission as the IRP process was unfolding. Issues with the wind integration study, in particular, have been well documented in this case to date and were also well documented in testimony submitted this past year in Docket No. 11-035-124. The testimony of Mark Widmer for the Utah Industrial Energy Consumers (UIEC) and Randy Falkenberg for the Office of Consumer Services (Office) details some of the issues. The attachment to Randy Falkenberg's

Direct testimony for the Office is particularly helpful in identifying some of the issues with the public input process as well as the study results.

In addition to the technical issues detailed in the referenced documents, regional organizational changes may lower wind integration costs for all utilities from what they are today. The NREL wind integration study completed for SWAT demonstrates that the larger the planning footprint, the lower the cost to integrate wind. Initiatives being pursued jointly by utilities in the west, and the potential development of the Efficient Dispatch Toolkit discussed by PacifiCorp on pages 56 and 57 could serve to lower wind integration costs significantly. For these reasons alone, the cost used by PacifiCorp over a 20-year planning period seems unreasonably high.

5. PacifiCorp Used Inconsistent Modeling Assumptions to Develop Core Case Portfolios and Undertake Energy Gateway Segment Analysis

PacifiCorp frames the conundrum facing it and other utilities as they consider the type, timing, resource selection, and supporting infrastructure needed to meet growing loads over the next decade in the section on transmission modeling. The question PacifiCorp poses and requests stakeholders to comment upon is whether the Company should pursue a "Green Resource Future" or follow the "Incumbent Resource Path."[22] PacifiCorp defines a Green Resource Future as follows:

> This outlook assumes that federal and state governments continue a 'green' resource strategy that optimizes renewable resources as a significant energy source and reduces carbon emissions. The outlook also assumes the United States takes an aggressive role in accelerating renewable resources through incentives, CO2 taxes or renewable targets. Demand for energy experiences a significant increase through renewed economic growth and the higher penetration of electric applications such as electric vehicles. Alternate resource technologies continue to

[22] PacifiCorp, 2011 Integrated Resource Plan, Volume 1, March 31, 2011, p. 48.

> be developed but the mainstay of renewable energy resource for the next twenty years is wind location in areas that offer economic and political acceptance.[23]

It defines the Incumbent Resource Future in the following manner:

> This scenario assumes carbon legislation and federal/state renewable energy requirements will subside, thereby lessening the demand for renewable resources and where they are placed. This scenario ignores natural gas price volatility and assumes stable natural gas prices which diminish the need for large wind resource additions and transmission projects originating in Wyoming over the next twenty years. Lower gas prices translate to serving loads with gas turbines located closer to Company load centers such as Utah. Alternate energy technologies such as electricity storage, battery and smart grid technologies will be developed, but the majority of new energy is generation from existing fuel resources.[24]

PacifiCorp's own conundrum in providing an evidentiary basis for having included the full Energy Gateway buildout in its core cases is its own inconsistently applied view of the future. While PacifiCorp proposes to build the full Energy Gateway to support high levels of Wyoming wind, the assumptions PacifiCorp used for modeling its core cases reflect an Incumbent Resource Future. As discussed above, the assumptions PacifiCorp uses to model wind do not support the very resource additions that are needed to justify constructing the full Energy Gateway, and the stochastic modeling demonstrates little hedging benefit of renewables against adverse market outcomes.

To justify the Energy Gateway segments, PacifiCorp assumes a federal RPS, an assumption that was not part of its core case development, and then adds adequate levels of wind resources to achieve the federal RPS targets. These results are compared against meeting the federal RPS with local wind generation. The results show a small benefit from the full buildout due to the better capacity value of the wind in Wyoming.

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[23] Ibid. p. 66.
[24] Ibid. p. 67.

As modeled, this IRP does not make the case for the full Energy Gateway Buildout. That is not to say that WRA is convinced that the case could not be made with more reasonable assumptions supporting renewable additions. While WRA does find the results significant, they are not compelling. Even with the late timing of the wind additions, and the previously identified issues with the stochastic modeling assumptions that undervalue the hedging benefit of renewable resources, the PVRR of the stochastic mean of the full build out using Wyoming wind is lower than the PVRR of meeting the federal RPS with local renewable resource with a lower capacity value.

IV. CONCLUSION AND RECOMMENDATION

Regrettably, this IRP reflects movement away from a responsive public input process. PacifiCorp controlled the public process, limited input, limited modeling requests, and limited access to results claiming time and resource constraints. The result is an IRP that is not technically supportable. The evaluation of environmental risk is incomplete and the stochastic evaluation of risk appears flawed. Overall, the IRP appears to have become an expensive regulatory exercise that is not providing the public benefit intended.

WRA recommends the Commission pursue one of two paths forward. The Commission could, as it has done in the past, issue an order not acknowledging the IRP with clear directives for improvement in the next planning cycle. This approach seems reasonable when no near-term capital investments or requests for cost recovery are expected. However, given the significant investment the Company is undertaking in the near-term, WRA believes the public may be better served by the Commission taking a more "active-directive role" as allowed for and anticipated by Standard and Guideline 7.[25]

If the Commission determines a more active directive role is warranted, WRA recommends the Commission issue an interim order directing PacifiCorp to address the shortcomings of this IRP with a timeline for correcting the deficiencies and a procedural schedule that could include a hearing before issuing a final order. In the alternative, WRA recommends the Commission issue an order not acknowledging IRP 2011.

Dated this 7th day of September 2011.

Respectfully submitted,

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[25] "The Commission will review the Plan for adherence to the principles stated herein, and will judge the merit and applicability of the public comment. If the Plan needs further work the Commission will return it to the Company with comments and suggestions for change. This process should lead more quickly to the Commission's acknowledgement of an acceptable Integrated Resource Plan."