

BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Acknowledgment of)
PACIFICORP Integrated Resource Plan)
2007)

Docket No. 07-2035-01

SUBMITTED BY WESTERN RESOURCE ADVOCATES
On behalf of:

WESTERN RESOURCE ADVOCATES,
UTAH CLEAN ENERGY & THE SIERRA CLUB

The Public Service Commission of Utah has asked interested parties to comment on PacifiCorp’s 2007 Integrated Resource Plan (IRP). Specifically, the Commission requested comments on both the appropriateness of the IRP, and whether or not it should be acknowledged. Western Resource Advocates (WRA) appreciates this opportunity to provide its comments on PacifiCorp’s IRP.

WRA recognizes the extremely difficult planning environment for all electric utilities today. Uncertainty abounds, with the greatest risks associated with future carbon dioxide regulation, gas and electricity market prices, and new technology. Balancing these risks to provide a least-cost, least-risk portfolio is no easy task. In addition, the choices of available resources to meet growth all have varying degrees of attributes and deficiencies. WRA recognizes that, from a purely economic standpoint, there is no obvious, easy resource answer, and we recognize and appreciate the effort that PacifiCorp has put into developing the IRP.

However, PacifiCorp has failed to fulfill several important features of the Utah IRP process. Due to a range of inaccurate model assumptions and unnecessary model restrictions, we believe the proposed PacifiCorp IRP filing is flawed in the following manner:

- A. PacifiCorp’s proposed IRP fails to include an array of critical new public policy objectives entered into just prior to, and soon following, the submittal of its IRP filing. These current public policy initiatives, excluded from PacifiCorp’s projected planning environment, affect 4 of the 6 states PacifiCorp operates in, representing 75% of the Company’s current energy sales requirement.
- B. PacifiCorp failed to incorporate a wide range of indirect costs and externalities in its evaluation of rival portfolios to fulfill future load obligations. Given the modest differences in cost among tested scenarios and portfolios, appropriate consideration of the excluded impacts may alter the ultimate portfolio selection.

- C. PacifiCorp's IRP model is limited in its ability to accurately assess future risk – particularly concerning the cost of carbon dioxide (CO₂) emission reduction or offset – or the potential of renewable energy and DSM to mitigate that risk. The inputs and logic of the various IRP models, and the analysis of the results, do not convey a realistic assessment of potential future costs. PacifiCorp has recognized the model's limitations, and has relied on simplifications in the models' input assumptions and structure in attempt to address them. Because of these simplifications, the Commission should not rely exclusively on the output of the models to select the ultimate resource portfolio to meet future load obligations.
- D. PacifiCorp significantly downplayed the capability of its DSM programs to reduce load and energy requirements. For example, PacifiCorp's load projection utilized DSM capability values even lower than its own conservative estimates of its DSM programs as calculated in a separate study.
- E. The PacifiCorp IRP fails to properly evaluate the costs and benefits of potential renewable energy resources. Of particular concern, PacifiCorp used wind energy as a proxy for all renewable energy sources and completely ignored the opportunity to fully evaluate other renewable resources including solar and geothermal energy.

Accordingly, despite WRA's respect and understanding of the difficult task PacifiCorp undertakes in the development of its IRP, ***WRA strongly recommends that the Commission not acknowledge PacifiCorp's IRP at this time.***

The Utah IRP Standards and Guidelines

In Utah an IRP will be "acknowledged" if it meets the Standards and Guidelines for Integrated Resource Planning which the Commission promulgated in 1992 in Docket 90-2035-01. Among the specific standards and guidelines¹ which we believe PacifiCorp's IRP fails to satisfy are:

- 1) Consideration of environmental externalities and attendant costs must be included in the integrated resource planning analysis. The IRP analysis should include a range, rather than attempts at precise quantification, of estimated external costs which may be intangible, in order to show how explicit consideration of them might affect selection of resource options.
- 2) The integrated resource plan must evaluate supply-side and demand-side resources on a consistent and comparable basis.
- 3) The process should result in the selection of the optimal set of resources given the expected combination of costs, risk and uncertainty.

¹ See IRP 2007, App.I.

4) The IRP must include an evaluation of all present and future resources, including future market opportunities (both demand-side and supply-side), on a consistent and comparable basis.

5) The IRP must include a plan of different resource acquisition paths for different economic circumstances with a decision mechanism to select among and modify these paths as the future unfolds.

6) The IRP must include considerations permitting flexibility in the planning process so that the Company can take advantage of opportunities and can prevent the premature foreclosure of options.

In the following sections, WRA describes in detail the deficiencies of the PacifiCorp IRP filing. In doing so, we will also describe which of the Utah IRP Standards and Guidelines that PacifiCorp failed to comply with.

A. PacifiCorp’s Proposed IRP Fails to Include an Array of Critical New Public Policy Initiatives and Trends

PacifiCorp’s IRP filing incorporates an inaccurate planning environment, putting in doubt all the scenarios and portfolios tested. In large part, this was no fault of the company’s. PacifiCorp’s IRP analysis occurred just prior to the establishment of critical public policy initiatives. As described in Section 3 of the IRP, the planning environment represents “major external influences that impact PacifiCorp’s long-term resource planning.”²

Two significant public policy initiatives have advanced since just prior to, or just following, PacifiCorp filed its IRP: (1) Utah joined the Western Climate Initiative (WCI), and the WCI established greenhouse gas (GHG) emission reduction goals; and (2) Utah initiated the Renewable Energy Initiative Focus Group (REI), which is currently evaluating a suite of policy options, including a renewable portfolio standard (RPS). These very recent public policy initiatives were excluded by PacifiCorp in the setting of its planning environment to its resource valuation models, yet both of these initiatives are likely to impact the resources and costs PacifiCorp relies on to meet their customer’s load obligations.

Western Climate Initiative

On May 21, 2007 (just nine days prior to filing the proposed IRP), Utah Governor Jon Huntsman signed an agreement to join the WCI. The WCI was formed in order to develop a regional coordinated effort to reduce the emissions of GHG and the impact associated with climate

² IRP at p. 28

change.³ With Utah's membership, the WCI currently includes six western U.S. states, two Canadian provinces, and one Mexican state. Four of the six states served by PacifiCorp are members of the WCI. PacifiCorp's 2007 retail loads in these six states is projected to be roughly 43,650 MWh, representing 75% of PacifiCorp's projected 2007 total retail sales.

Critical to PacifiCorp's future resource planning, approximately just one week ago, on August 22, 2007, the WCI established a goal of a 15% reduction in GHG emissions below 2005 levels (or roughly equivalent to 2% above 1990 emission levels) by 2020. At this juncture, it is not clear how the WCI emissions objective will impact individual economic sectors of each participating state (each state must develop an action plan to meet a state-specific target). Accordingly, for purposes of this discussion, we (conservatively) assume the general 15% emission reduction is applicable to PacifiCorp.

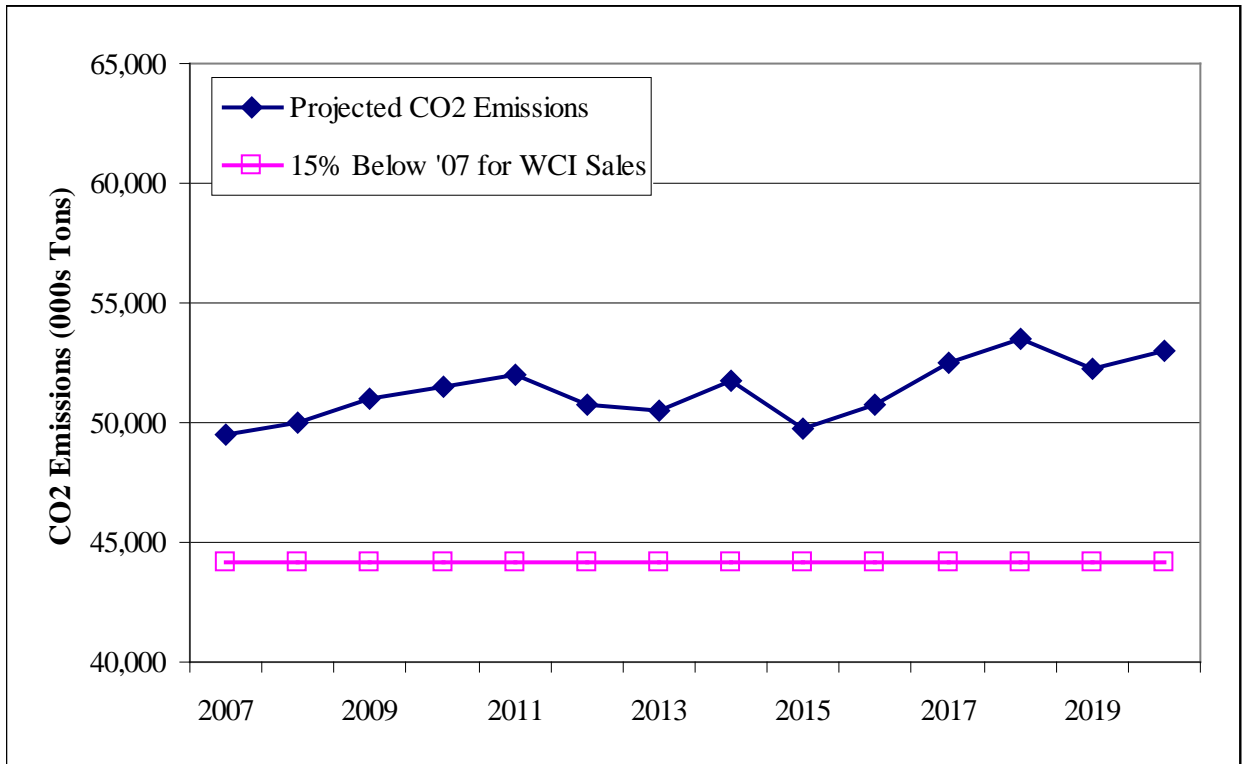
Meeting the WCI emission reduction target will take extraordinary effort and immediate planning and implementation. Simply put, PacifiCorp's proposal to develop and operate two additional pulverized coal plants will greatly jeopardize the company's (and possibly, the state's) ability to meet the new WCI emission reduction goals.

Figure 1 depicts PacifiCorp's projection of CO₂ emissions for the proposed IRP portfolio (RA14). PacifiCorp projects total CO₂ emissions increasing from approximately 49.5 million tons in 2007 to 53.0 million tons in 2020, an increase of 7.1%. Assuming PacifiCorp is required to make a 15% reduction in its CO₂ emissions associated with sales to WCI-member states, its CO₂ output needs to be held to approximately 44,150 thousand tons of CO₂, depicted by the pink line in Figure 1.⁴

³ The WCI expressly described potential impacts of climate change, citing "prolonged droughts, excessive heat waves... more severe forest and rangeland fires, widespread forest diseases and other serious impacts," and made a direct connection between climate change consequences and human activity, stating that "human-caused greenhouse gases (GHGs)... are affecting the Earth's climate."

⁴ 2005 CO₂ levels were not available for PacifiCorp. 2007 was applied as a conservative proxy. The value of 44,150 thousand tons of CO₂ is based on a general requirement of a 15% reduction in 2007 sales to states who have signed on to the WCI commitment thus far.

Figure 1 - PacifiCorp Projected CO₂ Emissions (Avg. of CO₂ Adder Cases)



To meet the general target assumed in the figure above, PacifiCorp will be required to reduce or offset, in some manner, at least 8.85 million tons of CO₂ per year, or roughly 17% of its CO₂ footprint by 2020. At a cost of \$30/ton of CO₂, PacifiCorp’s carbon profile will cost its customers an additional \$265 million per year. This value is obviously rough, but for a variety of reasons, fairly conservative. If, for example, we assumed the \$30/ton allowance value increases at a 2.5% rate of inflation and we assume Wyoming joins the WCI, PacifiCorp’s 2020 emission allowance risk could be as high as \$423 million per year.

As described in greater detail in the Section B of these comments, PacifiCorp failed to adequately consider the risk of controlling or offsetting CO₂ emission due to inappropriate model inputs and the manner it averaged the results of all its assessed alternative futures.

Critically, PacifiCorp’s proposed portfolio will negate the opportunity for the state’s electric sector to meet the regional emission reduction target. The Utah PSC should not allow PacifiCorp to continue down this path without an analysis of how the state’s new commitments are most cost-effectively met. Accordingly, the PSC should not acknowledge the IRP filing without significant revisions evaluating how PacifiCorp will meet the Utah-specific reduction target.

Due to the timing of PacifiCorp’s IRP filing in light of WCI policy announcements, PacifiCorp’s

resource portfolio plans are simply inconsistent with current policy trends. Accordingly, the PacifiCorp IRP should not be acknowledged. PacifiCorp should be directed to redo its analysis to meet current policy objectives.

Utah Renewable Energy Initiative

Utah is currently evaluating various policies, including an RPS, to promote renewable energy under the Renewable Energy Initiative Focus Group. The REI is a sub-stakeholder group for Governor Huntsman's Blue Ribbon Advisory Council on Climate Change and the Department of Environmental Quality's Climate Change Stakeholder Workgroup. Given the trend of RPS as adopted in western states, including California, Oregon, and Washington, and throughout the country, it is possible that Utah will follow suit, requiring PacifiCorp to procure an increasing percentage of energy from renewable resources. Governor Jon Huntsman has indicated his support of a goal for Utah to produce 20-plus percent of its power from renewables within the next two decades.⁵

As part of its IRP analysis, PacifiCorp incorporated far too low a renewable energy requirement as part of its alternative future scenarios. For example, in 13 of the 16 alternative future scenarios, PacifiCorp applied its "medium value" of RPS-required energy. The medium value for the RPS-required energy was just 6% of total system-wide sales by 2020. Assuming Utah adopts an RPS requirement in upcoming legislation, which appears to be a reasonable assumption at this juncture, four of the six states PacifiCorp operates in will require renewable energy content, and 72% of its retail energy sales from 2007-2020 will be subject to an RPS requirement. Assuming Utah adopts a relatively conservative 15% RPS requirement by 2020 (consistent with Washington but below Oregon and California), 11.9% of its total energy sales will be required as derived from renewable sources (or RECs purchased to offset).

Granted, Utah's REI effort represents a very recent policy trend, and is not yet finalized. However, given the state's activities to examine the adoption of an RPS and other renewable energy policies, it is only appropriate at this time for PacifiCorp to set its planning environment based on the most accurate information and reasonably projected future environment available. On its own, this missed policy trend is probably not enough to warrant non-acknowledgement of PacifiCorp's IRP. But when combined with other policy initiatives not incorporated in the planning environment and other deficiencies in the IRP raised herein, in total, the PacifiCorp IRP clearly should not be acknowledged at this time.

B. PacifiCorp Excluded a Wide Range of Direct and Indirect Costs in its IRP Analysis

PacifiCorp's IRP analysis failed to assess the value of numerous indirect costs and externalities in evaluating competing technologies and portfolios. The excluded costs and externalities could be

⁵ See the reporting article at www.ksl.com/?nid=148&sid=1506533

of significant magnitude such that appropriate inclusion of their value would significantly alter the ultimate resource selection.

Price Elasticity of Fuel Commodity Purchases

PacifiCorp failed to include in its resource evaluation process any consideration of the price elasticity of demand for its commodity fuels, natural gas and coal. That is, by reducing its consumption of natural gas and coal, PacifiCorp – as such a large purchaser in the western US – could alter the price of these commodities. In testimony to the U.S. Senate, Dr. Ryan Wiser of Lawrence Berkeley Laboratory reported that natural gas has an inverse price elasticity of 0.8 – 2.0, and possibly as high as 4.0.⁶ Accordingly, for every 1% decline in natural gas consumption, prices are likely to decrease 0.8% - 2.0%. This impact is likely to impact both the pure commodity and the transportation component of the cost of the fuel. For a utility such as PacifiCorp that procures natural gas in significant quantities across a wide region, a reduction in its fuel procurement due to increased efficiency or incremental generation via renewable resources could result in significant cost reductions. This benefit of DSM and renewables is, as we understand PacifiCorp’s modeling techniques, simply not captured in the Company’s resource analyses.

Appropriate Consideration of Environmental Externalities

Utah’s IRP Standards and Guidelines require that the “[c]onsideration of environmental externalities and attendant costs must be included in the integrated resource planning analysis.” However, PacifiCorp’s externality analysis was limited to quantifying only the *direct* cost of anticipated regulation of CO₂, NO_x, SO₂ and mercury.⁷ WRA believes the Commission standards require a far broader analysis. WRA understands the Commission’s guidelines to require the utility to assess the societal costs of all externalities – not just externalities to the extent they might be internalized in the future. PacifiCorp has confused its risk-assessment analysis with its obligation to assess the impacts of its resource choices which will not be reflected in the resource price.⁸

Evaluation of externalities should properly include, but not be limited to, public health impacts, regional haze and air pollution, climate change, wildlife impacts, and disruption of Native American religious sites, noise etc. PacifiCorp’s IRP neglects an assessment of these types of external costs. Moreover, the impacts of externalities (*e.g.*, mercury emissions) must be assigned a cost to generators whether or not one expects that emission to be regulated in the future with an associated cost of removal. Furthermore, the external cost of mercury – in terms of health impacts – may be much greater than the cost of removal. As such, PacifiCorp’s coal generation,

⁶ See

http://energy.senate.gov/public/index.cfm?FuseAction=Hearings.Testimony&Hearing_ID=1403&Witness_ID=4028

⁷ PacifiCorp IRP at 132

⁸ *Ibid* at 187

without mercury removal, must be assigned a cost associated with the health impacts, poisoning of streams and waterways, and effects on fish and wildlife populations.

Importantly, PacifiCorp attaches unwarranted weight to minor differences in its analysis of present value of revenue requirements (PVRR) as the primary tool within the resource selection process. As an example, RA6, which includes no pulverized coal, is projected to increase rates by \$3.31/MWh. Yet even PacifiCorp's own study shows the lowest rate impact scenario, RA-1, would nevertheless increase rates \$3.08/MWh.⁹ This difference is well within what WRA would expect is the margin of error of PacifiCorp's analysis, and even if accurate amounts to an average rate differential of only \$0.00023/KWh. For a typical residential customer consuming 600 KWh per month, this means that PacifiCorp could avoid the risks and impacts of additional pulverized coal for about 12 cents per month. WRA would venture that Utah customers would gladly pay an additional \$0.12/month on their electric bills to avoid the impacts of more pulverized coal plants serving their needs.

Given the myriad externalities not monetized nor even weighted in PacifiCorp's resource selection process, we believe the differences in portfolio costs are likely even less than reported or perhaps inverted (*i.e.*, if accurately monetized, the portfolios with lower emissions of CO₂ and other pollutants would indicate the best PVRR values). Selection of a portfolio which continues the current emissions trend would only exacerbate current risks. Given the wide range of uncertainty surrounding global warming and other impacts of pollution, WRA strongly advises the Utah Commission to issue a ruling that ultimately leads to lower levels of emissions of CO₂ and other pollutants to reduce the risks of associated externalities.

C. PacifiCorp's Models Incorporate Inappropriate Inputs and Logic

A range of inputs and assumptions, critical to PacifiCorp's resource models, were inappropriately designed and applied, distorting the model results. In Section A, above, we referenced PacifiCorp's assumption of a 6% system-wide RPS requirement by 2020 as the medium, or reference, value assumption in 13 of 16 alternative future scenarios.¹⁰ Given the possibility of Utah's implementation of an RPS, we believe that value is significantly too low by roughly half (*i.e.*, the appropriate value is approximately 12% or higher).

CO₂ Adder Inputs and Appropriate Discount Rates

Similarly, PacifiCorp utilized inappropriate CO₂ Adder values, particularly in its analysis of alternative future scenarios via its Capacity Expansion Module. The Company applied three values across the range of alternative futures: a low value of \$0/ton, a medium value of \$8/ton of

⁹IRP at 164.

¹⁰ Of the remaining three scenarios, two were given a low value of only 3% RPS requirement by 2020. Only one scenario incorporated a realistic 15% RPS requirement by 2020.

CO₂ (in 2008 \$), and a high value of \$37.9/ton of CO₂ (again, in 2008 \$). For a variety of reasons, these values are far too low. First, there is essentially no likelihood that CO₂ emissions (or allowances) will have no value whatsoever over the forecast period. Given that 72% of PacifiCorp's energy sales will be in states that have committed to significant reductions in CO₂ emissions via membership in the WCI, we believe PacifiCorp will be subject to the cost of CO₂ allowance purchases, and those allowance will not be free under any foreseeable circumstance. As stated above, we recognize the WCI emission reduction target was established subsequent to PacifiCorp's development and filing of the IRP; nonetheless, we should now proceed with *all* information that may be potentially critical to the Company's cost structure.

Second, even the medium CO₂ Adder value of \$8, escalating with inflation is far too low given current analysis of the cost of mitigating CO₂ emissions. An evaluation performed by SFA Pacific, Inc. indicates that adding existing technologies for CO₂ capture to an electricity generation process could increase the cost of electricity by 2.5 cents to 4 cents/kWh depending on the type of process (this equates to a CCS cost of about \$25-\$40/ton).¹¹ PacifiCorp also inappropriately utilized the \$8/ton value as the reference value for its stochastic analysis.

PacifiCorp does apply a reasonable cost projection of CO₂ allowance values via its high value estimate of \$37.9/ton. However, this high value is applied to only 6 of 16 alternative future scenarios. Importantly, PacifiCorp evaluates the results of its alternative future scenarios via a simple averaging methodology. That is, the weight placed on the low, medium, and high CO₂ Adder values is based on the number of alternative future scenarios run with each input. Of the 16 alternative scenarios, PacifiCorp ran 7 with the low (or \$0/ton) value, 3 with the medium value, and 6 with the high value. PacifiCorp then calculated the simple average of the results of these analyses to report on and to feed the inputs for further evaluation.

In its stochastic analysis via its Planning and Risk (PaR) simulation model, PacifiCorp broadened the array of CO₂ Adders applied; importantly, raising the high value to \$61/ton, which may be conceivable under periods of price volatility consistent with general market behavior. However, due to the assumed delayed implementation of the CO₂ Adder cases and the relatively high discount rate applied, there is only minimal variation among the various CO₂ Adder scenarios tested via the PaR model.

In Table 1, we repeat the values applied by PacifiCorp for the five CO₂ Adder cases defined in the PaR model.¹² PacifiCorp applied no value to CO₂ emissions through 2009 for all CO₂ Adder cases. More importantly, PacifiCorp applied only a minimal escalation value under all CO₂ Adder cases for the next four years of the analysis through 2013. Accordingly, for the first seven years of the IRP analysis period, all CO₂ Adder cases are exactly the same and incorporate only modest adder values. In at least one section of the IRP filing, PacifiCorp describes 2012 as "the

¹¹ See <http://www.fossil.energy.gov/programs/sequestration/capture/index.html>

¹² See Table A.9, Appendix A, p. 20.

assumed year of a fully phased-in CO₂ adder,” but that is only accurate for the \$8 CO₂ Adder case.¹³

The last two rows of Table 1 provide the present value of each CO₂ Adder stream based on an 8.5% discount rate through 2016 and 2026, respectively.¹⁴ Due to PacifiCorp’s applied delay and slow escalation to the target values, the resulting present value of the CO₂ Adders were extremely negligible (\$3.25 per ton of CO₂ in the high \$61 case).

Table 1 – PacifiCorp Values Applied & Statistical Analysis of CO₂ Adder Cases

Year	<i>CO₂ Cost Adder Levels (\$Ton, 2008 Dollars)</i>				
	\$0	\$8	\$15	\$38	\$61
2007	-	-	-	-	-
2008	-	-	-	-	-
2009	-	-	-	-	-
2010	-	4.15	4.15	4.15	4.15
2011	-	6.34	6.34	6.34	6.34
2012	-	8.62	8.62	8.62	8.62
2013	-	8.78	8.78	8.78	8.78
2014	-	8.94	11.05	17.69	24.34
2015	-	9.10	13.89	35.63	67.43
2016	-	9.26	17.64	44.09	70.55
2017	-	9.43	17.97	44.90	71.85
2018	-	9.60	18.29	45.71	73.15
2019	-	9.77	18.62	46.53	74.45
2020	-	9.95	18.96	47.38	75.82
2021	-	10.13	19.30	48.24	77.19
2022	-	10.32	19.67	49.14	78.64
2023	-	10.52	20.05	50.10	80.16
2024	-	10.72	20.43	51.05	81.68
2025	-	10.92	20.81	52.00	83.20
2026	-	11.13	21.20	52.99	84.78
PV thru 2019 @ 8.5%	-	\$2.07	\$2.20	\$2.66	\$3.19
PV thru 2026 @ 8.5%	\$0.00	\$2.08	\$2.22	\$2.70	\$3.25

¹³ See IRP, p. 124

¹⁴ The PV calculation was placed in 2007 dollars (*i.e.*, only 2008 – 2016 values were discounted)

Given the broad societal and long-term impacts of the decisions made through this IRP process, PacifiCorp's discount rate of 8.5% is inappropriately high. Although this value represents PacifiCorp's cost of capital, it is not necessarily the appropriate value to reflect societal investments which have wide ranging impacts as climate change, mercury deposition, and other environmental impacts. Instead, we would recommend using a lower societal discount rate appropriate for long-term decision making.¹⁵

Based on the discount rate applied and slowly escalating CO₂ values applied, the CO₂ Adder scenarios show only minimal variation in the risk exposure from the various CO₂ Adder cases tested. We believe this treatment of future risk greatly undermines its importance in the future. The Utah Commission should evaluate carefully the appropriate discount rate to apply to such long-lived and long-impacting assets. At a minimum, the Utah PSC should review the PVRR calculations under a range of discount rates to allow full assessment of the impact on current and future generations.

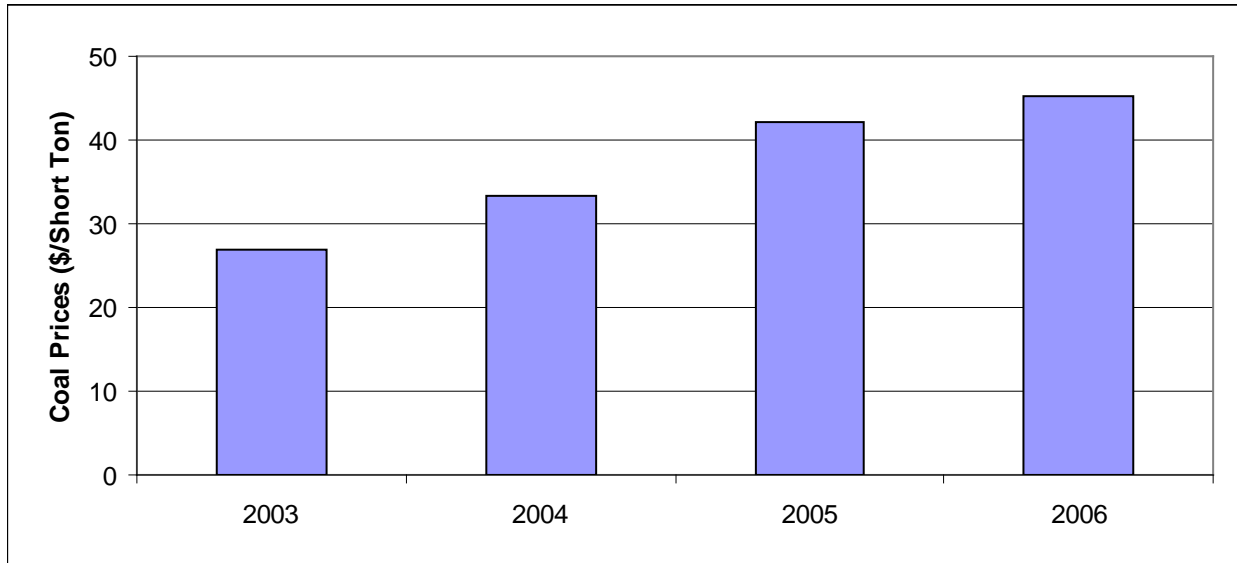
Coal Price Volatility

PacifiCorp's IRP fails to assign realistic price volatility risk to coal as a fuel source. The Company's analysis assumes coal costs will escalate approximately 4% per year. The high value incorporated in 4 of 16 alternative future scenarios include a high value which adds a 20% premium to the reference forecast. In recent past, however, coal prices have been extremely volatile. From 2003 to 2006, coal prices in Utah have increased 68%.¹⁶ See Figure 2. We believe the volatility inherent in the coal markets has been downplayed by PacifiCorp in its application of the models.

¹⁵ See comments of the American Society of Civil Engineers, http://www.asce.org/files/pdf/pressroom/flep_comments.pdf

¹⁶ See EIA Quarterly Coal Price Report, Table 25, 2004 - 2006

Figure 2 – Coal Prices Delivered to Utah Industries



D. PacifiCorp’s IRP Fails to Evaluate Supply-Side and DSM Resources Consistently

Utah’s IRP Standards and Guidelines require that the “integrated resource plan must evaluate supply-side and demand-side resources on a consistent and comparable basis.” PacifiCorp’s IRP failed to meet this basic requirement.

PacifiCorp’s DSM analysis lacked adequate consideration of Class 2 DSM, and understated the potential, and optimality, for all customer classes. PacifiCorp assumes Class 2 DSM will reduce its peak requirements by *only 2.2 % through 2016*.¹⁷ Furthermore, Class 2 DSM resources are projected to reduce total electricity use (MWh) in 2016 by 1,986 GWh, only 2.75% of the projected electricity use of 72,306 GWh in 2016. This is wholly deficient, and below the DSM achievable by even the most conservative utility estimates anywhere in the country. For example, the Energy Efficiency Task Force convened by the Western Governors’ Association reported that leading electric utilities in the country are investing 2-3 percent of their revenues in DSM programs and are savings 0.8-1.0 percent of electricity sales each year. This means saving 8-10% of electricity use after a 10-year DSM effort. In 2006 alone, Rocky Mountain Power’s DSM programs in Utah saved about 120 GWh/yr of electricity, equivalent to about 0.58% of the company’s retail electricity sales. Future DSM programs in Utah and other parts of the PacifiCorp service area should be able to save at least this amount if not more, meaning savings of at least 6% at the end of a 10-year DSM effort.

¹⁷ See IRP App. A at 6

PacifiCorp recently evaluated DSM potential in its overall service area but this study has a number of flaws that lead to underestimation of DSM potential. For example, the study is overly conservative regarding energy savings potential in lighting, the study virtually ignores energy savings potential in electronic products (plug loads), the study fails to adequately address savings opportunities in the important area of HVAC auxiliary energy in commercial buildings, and it does not consider achievable DSM potential in a 10-year time frame, as indicated in comments submitted to PacifiCorp by the Southwest Energy Efficiency Project (SWEET) on Aug. 24, 2007.

Furthermore, PacifiCorp has included less DSM resource in its IRP than even its flawed potential study indicates is achievable. In particular, the flawed DSM potential study shows 7% energy savings potential over 20 years, meaning average savings of 0.35% per year. This suggests savings of 3.5% after 10 years, not the 2.75% savings used in the resource plan. But once again the DSM potential study has numerous shortcomings that lead to underestimation of achievable DSM potential.

Another problem with the consideration of DSM in the IRP is that the resource plan shows the energy savings from DSM programs declining over time (see p. A-28). This runs counter to recent experience of PacifiCorp and many other utilities that have been able to increase the savings from cost-effective DSM programs over time, not reduce it. Energy savings technologies are improving in performance and cost over time, energy prices are rising, and concerns about environmental problems in particular global warming are rising. This further suggests that achievable energy savings potential will continue to rise, not fall.

The IRP has also fails to treat DSM as a true resource that can be scaled up or down depending on resource needs and alternatives. DSM is not a fixed resource. The company can increase the amount of DSM it acquires by increasing incentives paid to customers or by increasing program marketing, for example. Likewise, additional energy efficiency measures or programs can be implemented. PacifiCorp has completely failed to consider DSM robustly as a flexible resource, with varying costs and benefits depending on scale and scope of effort. DSM is taken as a given (and a rather small “given”), rather than compared on a level playing field to supply-side resources. In this manner, DSM should be considered and selected as long as its cost of saving energy is less than the cost of supplying energy from alternative resource options.

PacifiCorp should not be granted approval to go forward with plans to construct significant new greenhouse-gas emitting power plants simply because it has not yet developed a strong DSM analysis or strategy. WRA believes that all cost-effective DSM measures should be utilized by PacifiCorp, as quickly as that resource can be deployed. Moreover, cost-effectiveness must include the anticipated costs of CO2 regulation and any anticipated required mitigation of other environmental impacts. The economics of DSM should be selected with the recognition that it is low-cost, clean, and avoids virtually every risk of traditional supply-side resources in today's markets.

E. The IRP Fails to Properly Evaluate the Costs and Benefits of Potential of Renewable Energy Resources

The Utah IRP Standards and Guidelines require that the “process should result in the selection of the optimal set of resources given the expected combination of costs, risk and uncertainty.” However, PacifiCorp’s evaluation of renewable resources fails to fulfill that requirement of the IRP Standards.

PacifiCorp pre-screened many renewable resources under the notion that modeling “wind energy” could serve as a surrogate for all renewables.¹⁸ Solar, geothermal, wind and other renewables all have different cost, dispatchability, technology risk and carbon risk profiles. Just as a coal plant could not be used as a surrogate for all conventional resources (*e.g.*, SCCTs, CCCTs, pulverized coal, IGCC and nuclear), neither can wind be used as a surrogate for the many types of renewable resources available to PacifiCorp.

PacifiCorp’s IRP concludes that the Company should deploy an additional 2000 MWs of wind power by 2014. While WRA recognizes this as a substantial commitment to a useful resource, PacifiCorp failed to assess the potential of other, possibly superior renewable resources which could be deployed either in addition to, or in lieu of, its wind power commitment. Moreover, PacifiCorp does not adequately consider the likelihood of a substantial renewable energy requirement in Utah in the near future.

Utah’s potential energy production from solar, wind, and geothermal facilities is significantly larger than the state’s actual energy requirements. According to recent analyses, the total productive capacity of these three renewable energy sources is approximately 33 million MWh/year, or roughly 1.5 times Utah’s total 2006 energy requirement of 23 million MWh.¹⁹

Table 2 – Utah Renewable Energy Potential

Renewable Energy Source	Energy Generation Potential (millions of MWh / year)
Solar	1
Geothermal	9
Wind	23
Total	33

¹⁸ IRP at 7

¹⁹ Solar estimate is based on Chaudhari, M.; Frantzis, L.; Hoff, T.E., “PV Grid Connected Market Potential in 2010 under a Cost Breakthrough Scenario,” prepared by Navigant Consulting for The Energy Foundation, September, 2004. The 1 million MWh value is based on a 10% penetration level of Utah’s overall technical potential for rooftop photovoltaic solar in 2010. Wind and geothermal estimates were taken from “Renewable Energy Atlas of the West” written by Land and Water Fund of the Rockies, Northwest Sustainable Energy for Economic Development, and GreenInfo Network, July, 2002.

Importantly, Utah's residents strongly support renewable energy development. KSL-TV and Deseret Morning News recently reported on Utah's views of renewable energy and energy conservation. According to the report, over 90% of Utahns support government incentives and investments to support wind, solar, and energy efficiency.²⁰

Of particular concern in the 2007 IRP is the lack of consideration of solar energy investment by PacifiCorp. Utah has extensive solar resources throughout the state, and PacifiCorp should be taking full advantage of that resource. Although the unitized capital cost for solar is considered fairly high, distributed generation can be significantly more economic because customers are often willing to pay a large percentage of the cost of rooftop photovoltaic installations - which greatly reduces the utility's capital outlay. In addition, Utah recently passed a tax credit to help reduce solar costs for customers.

In its list of potential resources available for consideration, PacifiCorp included a single potential solar installation: a 200 MW solar-thermal trough with natural gas backup in its eastern region.²¹ PacifiCorp excluded entirely distributed solar technologies from consideration.

As discussed above, fuel price risks and risks surrounding CO₂ costs were not properly assessed by PacifiCorp, thereby limiting the potential benefits of solar and other renewable technologies. Furthermore, with respect to distributed solar installations, experience with other southwest utilities indicates strong customer interest in voluntary investment in photovoltaic and solar-thermal technologies. Xcel Energy, for example, has an extensive solar installation program whereby customers pay roughly half the cost of the installation. Xcel Energy's operations in Colorado estimate it will have 6 MW of customer-sited solar installed by the end of 2007, and over 20 MW by year-end 2008. PacifiCorp should alter its analysis of solar resources to include only company-specific funding of the resource.

Nationally, small-scale solar installations currently cost approximately \$7.50 per watt, or \$7,500 per kilowatt, a seemingly large up-front capital cost. However, many customers throughout the country are motivated (for environmental, independence, and economic reasons) to invest in solar energy, greatly reducing the installation cost to a utility such as PacifiCorp. In Colorado, Xcel Energy invests \$2.00 per installed kW, reducing the direct cost to the utility by 73%. Xcel Energy also credits the customer with the Renewable Energy Credits (RECs) up to a value of \$2.50/watt installed.²²

Furthermore, the cost of photovoltaic installations is rapidly declining and thus, will likely increase in cost-effectiveness over the duration of the PacifiCorp IRP planning period. Several companies are commercializing concentrating photovoltaic technologies which require greatly

²⁰ See the reporting article at www.ksl.com/?nid=148&sid=1506533

²¹ See Tables 5.1 and 5.2 of the IRP

²² The value of the RECs is not referenced in the direct cost of the solar rebate program as it represents a pass-through of costs otherwise incurred to meet the state RPS requirements.

reduced quantities of the cost-prohibitive silicon wafers utilized in photovoltaic technology. An additional technology breakthrough is the use of Thin-Film transistor (TFT) which utilizes a photovoltaic process with no silicon required. *First Solar* recently announced panel prices below \$2 per Watt – roughly half of the current price of Si-based products. In the near future, TFT-based products may be coordinated directly into roofing tiles, windows, and other building materials, as are silicon based products currently. All in all, given the resource choices and risks facing PacifiCorp today, a deeper examination of an aggressive solar deployment was warranted, but neglected, in its 2007 IRP.

Likewise, WRA does not believe that energy storage mechanisms should have been pre-screened from the selection process – as they were. Compressed-air energy storage (CAES), in particular, seems to hold great promise for providing dispatchability to renewable energy resources. Adding storage to PacifiCorp’s system can alleviate transmission needs and constraints, provide added capacity value to complement energy resources like wind.

Storage resources also appear economic (\$700/KW), and the IRP indicates they can be deployed quickly (2010) (IRP at 93-96). PacifiCorp’s cost and carbon impact calculations in the charts on these pages appears to assume that CAES and pumped storage would use CCCT energy as an input – when in fact those storage resources would most likely draw wind or other renewable, zero-emission, energy whenever it was available. While the stored energy is typically used for combustion turbine operation, the turbines are able to operate much more efficiently with the availability of already compressed air. In either case, WRA believes the environmental impact and resource cost numbers in the IRP are exaggerated in a way which unfairly disadvantages that resource.

It was incumbent upon PacifiCorp to nevertheless reasonably and fairly assess all potential resource options on a consistent and comparable basis. If the model was incapable of doing so, PacifiCorp should have found another way to compare resource choices. To dismiss or ignore some options because they could not be modeled is not a permissible way to make resource choices which will economically and environmentally impact PacifiCorp customers for decades.

In its discussion of the public participation process, PacifiCorp explains that it was not able to fully study many future resource options because of limitations to its current modeling capability. Specifically, PacifiCorp states that it screened out technology risk, that consideration of plant retirements and retrofits were beyond the capability of its current model, and that specifically its current model does not allow it to examine IGCC capture and sequestration if future conditions warrant such upgrades. Technology risk (*i.e.*, the risk that a new technology will prove uneconomic) should *not* be used as a screen to eliminate resources just as market price risk, gas cost risk and carbon risk are not used to screen out resources. This applies to IGCC, concentrating solar power, compressed air storage, and any other resources which PacifiCorp rejected because they are not yet commercially mature. Technology risk should be analyzed and assessed as any other risk PacifiCorp faces in its resource choice decisions, and valued accordingly. PacifiCorp states that in the future “it intends to explore new resource screening methods to accommodate a

broader range of technologies while meeting the requirement to assess technologies on a ‘consistent and comparable basis.’”²³ In essence, PacifiCorp agrees that its current IRP has not accomplished the task of consistently and comparably assessing all resources.

Conclusions

WRA appreciates the Commission’s consideration of these Comments. WRA requests that the Commission not acknowledge PacifiCorp’s IRP, and that it return the IRP to PacifiCorp for further analysis and development consistent with the discussion contained in these Comments.

Respectfully submitted,
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²³ IRP App. at 144.