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**DEPARTMENT OF JUSTICE**
GENERAL COUNSEL DIVISION

November 9, 2006

VIA EMAIL AND REGULAR MAIL

Attention: Filing Center
Public Utility Commission of Oregon
550 Capitol Street NE, #215
PO Box 2148
Salem, OR 97308-2148
Puc.filingcenter@state.or.us

Re: *In the Matter of PACIFICORP Draft 2009 Request for Proposals to Order No. 91-1383*
PUC Docket No. UM 1208
DOJ File No. 330-030-GN0967-06

Enclosed please find the original Reply Comments of the Oregon Department of Energy and five copies for filing today in the above-captioned matter.

Sincerely,

/s/ *Janet L. Prewitt*

Janet L. Prewitt
Assistant Attorney General
Natural Resources Section

Enclosures

c: Diana Enright, ODOE
UM 1208 Service List

JLP:jrs/GENR8693

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1208

| | | |
|---|---|---|
| In the Matter of<br>PACIFCORP Draft 2009 Request for<br>Proposals Pursuant to Order No. 91-1383 | )<br>)<br>)<br>) | REPLY COMMENTS OF THE OREGON DEPARTMENT OF ENERGY |

The Oregon Department of Energy (ODOE) appreciates the changes that PacifiCorp made to its revised RFP of November 1, 2005. The RFP is substantially improved. ODOE especially appreciates the addition of IGCC and base-load renewables (biomass and geothermal generation) as Eligible Resource Alternative Categories number 10 and 11 (see pages 12, 21 and 22 of the Clean Version of the RFP).

ODOE has some remaining concerns. It is not clear that the Commission will get the analyses that it needs to evaluate the final short list from the RFP when PacifiCorp requests acknowledgement. These include the assumptions regarding the amount and type of renewable resources that PacifiCorp will acquire outside the RFP before 2013, the value of smaller-sized generating units, the value of units with better ramping capability and the implications of alternative input assumptions used in modeling.

**Renewable Resource Assumptions**

The Commission should make clear that PacifiCorp's assumption of 1,400 MW of renewable resources and the associated on-peak capacity to be used in modeling the initial short list of proposals are floor values. The request for acknowledgement will need to demonstrate the appropriate values.

The 1,400 MW is a commitment from the merger docket, UM 1209. It lacks an empirical foundation. The 2006 IRP is considering alternative plans with up to 2,000 MW of wind

generation. The requests for acknowledgment of the IRP and final short list of proposals should demonstrate the appropriate level of renewable acquisitions 2007-to-2013.

The percentage capacity credit proposed by PacifiCorp is also a limiting condition. It assumes that 100 percent of all of the remaining renewable resource acquisitions will be wind, the resource with the lowest on-peak capacity credit. Yet, renewable resource acquisitions to date include significant amounts of small biomass and geothermal resources.

It is likely PacifiCorp will continue to acquire biomass and geothermal resources outside of this RFP. PacifiCorp's response to ODOE data request #29 regarding the capacity credit for the renewable resources to be acquired refers to PacifiCorp's supplemental response to OPUC data request #48. The "Wind" tab of this spreadsheet "OPUC a-1(1st supplement)" contains a 20 percent peak capacity credit for the remaining 538 MW of the East Side renewable commitment to be acquired by 2014. This value implies only 108 MW of on-peak capacity for the East Side of the PacifiCorp system.

PacifiCorp's Compliance Filing Document, *"Preliminary Renewable Energy Action Plan- September 21, 2006,"*[1] contains the following definition and plan description on pages 1 and 2:

> "**Renewable Resources Definition for meeting the 1,400 Megawatt Target**
> For the purposes of this document, PacifiCorp adopts a definition of renewable resources as follows:
>
> > *Renewable energy resources means electricity generation facilities fueled by solar; wind; geothermal; solid, liquid, or gaseous forms of biomass (including co-firing, wood mill waste and forest waste); landfill, coal mine, or digester methane; wave or tidal power; new fresh water hydroelectric facilities or upgrades to existing hydroelectric facilities where the additional generation in either case does not result in new water diversions or impoundments; or hydrogen derived from either electrolysis or a non-hydrocarbon derivation process*.
>
> For the purposes of meeting the 1,400 megawatt target, PacifiCorp will utilize the nameplate generating capability of any renewable resource added to PacifiCorp's portfolio beginning in January 2003 (the date that PacifiCorp first committed to acquiring

[1] The Compliance Filing - Commitment 0-26a from Docket No. UM 1209 (the MEHC acquisition of PacifiCorp docket) can be found at http://edocs.puc.state.or.us/efdocs/HAD/um1209had155918.pdf.

> 1,400 megawatts of cost-effective renewable resources). These renewable resource additions will include all renewable resources as defined by the Renewable Resource definition."[2]

The system capacity credit for the East Side of PacifiCorp's system should assume a mix of renewable resources. Acquisitions to date on the East Side have been 47 percent geothermal and 53 percent wind (data from "OPUC a-1(1st supplement)" spreadsheet "wind" tab, and reproduced on the spreadsheet attached as Exhibit 1). Applying PacifiCorp's capacity credits for these resources would yield an average on-peak capacity credit of 58 percent for the remaining East Side renewable commitments of 538 MW. This would yield a dependable East Side capacity of 311 MW (see Exhibit 1), Page 2 of 2.

This value is substantially different from the assumptions used to justify the size of the 2012 Baseload RFP. The Commission's approval order for the RFP should require that PacifiCorp's request for acknowledgement justify the peak capacity credit for renewables acquired outside the RFP.

The IRP estimated level of renewables in the IRP/RFP modeling needs at least one other refinement. The lifetimes assumed by PacifiCorp for wind and coal plants are 20 and 40 years, respectively. PacifiCorp has not provided a justification specifying the kinds of events or maintenance costs that would limit the life of utility-owned wind turbines to 20 years. Neither the wind towers nor the turbine blades should wear out at 20 years. Only the mechanical components would need replacement at that time. Mechanical components are a relatively low fraction of the capital costs so replacement to extend the wind plant life another 20 years should be economic. The percentage of capital costs of a wind plant for mechanical equipment are certainly less than for a coal plant (given by PacifiCorp as 63 percent of the capital cost of a super-critical pulverized coal plant coal plant in response to ODOE Data Request # 34).

2 The document explains, at footnote #1, that "This definition addresses MEHC commitments c22b, 026b and Wy2lb which specify: 'PacifiCorp commits to address as part of its next IRP the appropriate role of incremental hydropower projects in meeting the 1,400 MW renewables target.'"

Given the risks that high $CO_2$ cost adders will be implemented before 2032, the 20th year of plants built in 2012, the effective lifetime for baseload coal plants might be 20 years while 40 years seems a more likely lifetime for the wind power plants. This is the reverse of PacifiCorp's assumptions. The Commission's approval order should indicate that the application for acknowledgement of the final short list of proposals from the RFP should include a clear justification of PacifiCorp's assumptions for wind and coal lifetimes and the resulting levels of renewable resource acquisitions through 2013. If PacifiCorp continues to insist on its original lifetime assumptions, it should provide a sensitivity analysis with lifetimes of 20 years for coal and 40 years for wind.

**The Value of Smaller-Sized Generating Units**

The useful value of the peaking capacity of four generating units of 100 MW each is greater than for one 400 MW unit. This is referred to as single-shaft risk. It is highly unlikely that four independent generation units will be out of commission simultaneously. In contrast, whenever a 400 MW suffers an unplanned outage, the system loses the full 400 MW of capacity. If that occurs at the time of the system peak load, system reliability will suffer. It is not clear that the modeling of the initial short list will account for the diversity value of smaller-sized generation units. PacifiCorp should demonstrate that it has adequately considered this effect in selecting its final short list of proposals.

An additional value of small plants, which has not been accounted for in PacifCorp's analysis, is that they could contribute to a bridging strategy, allowing PacifiCorp to defer or reduce an irreversible commitment to pulverized coal. This could allow other technologies, such as binary geothermal or IGCC, to emerge.

**The Value of Generating Units with Better Ramp Rates**

Different kinds of generating units have different capabilities to ramp up quickly to meet variations in load and generation. This will be increasingly important as PacifiCorp adds more

intermittent resources, such as wind generation. PacifiCorp should demonstrate that it has adequately considered this effect in selecting its final short list of proposals.

**Additional Analyses to Assist the Commission's Acknowledgement Decision.**

In addition to the analyses discussed above, PacifiCorp should provide appropriate scenarios of input assumptions and provide critical value analyses.

A critical value analysis shows how high an uncertain but important input value would have to be to tip the decision from one project to another. PacifiCorp should determine the critical value for the key but uncertain input assumptions, such as the $CO_2$ cost adder, natural gas prices and coal prices, that drive important decisions in the 2012 Baseload RFP/IRP. If the decision were between a baseload geothermal plant and a baseload pulverized coal plant, a critical-value analysis would show how high the 2020 $CO_2$ cost adder would need to be to tip the decision to the geothermal plant. Similarly, if the decision were between coal plants with different fuel efficiencies (heat rates) and capital costs, the analysis would show what price of fuel would tip the decision to the more efficient plant. Without this type of analysis, it will be difficult for the Commission to judge whether or not to acknowledge the final short list of proposals from the 2012 Baseload RFP.

Finally, there is an additional $CO_2$ cost-adder scenario that might be useful to the Commission. The $CO_2$ scenarios that PacifiCorp plans to use to evaluate the initial short list of proposals have overly simplistic trends. The base-case scenario fixes the $CO_2$ cost-adder (2010$) at $8.30 per ton from 2012 onward. The alternative PacifiCorp scenarios will use fixed $CO_2$ cost adders of zero, $10, $25 and $40 (1990$). Some may argue that adders much above $8 are politically unlikely in 2012 and dismiss the higher $CO_2$ scenarios entirely. However, none of the scenarios has a trend after 2012. A more realistic trend would have the cost adder grow, at least through 2020. A dismissal of the scenarios with higher cost adders would be premature because it is likely the $CO_2$ regulatory costs will continue to rise after 2012.

As an alternative, at least one scenario should start at the $8.30 per ton level of $CO_2$ in 2012 and rise to at least $35 per ton (2010$) in 2020, and remain at $35 thereafter. Note that $8.30 transitioning to $35 (2010$) is in the medium range of the $CO_2$ scenarios required under OPUC Order No. 93-695. This order requires analysis of scenarios in the range of approximately 0-to-$60 2010 dollars (see PacifiCorp IRP, Jan. 2005 at 158). This scenario is more consistent with the recent cost-adders in Europe. Forward prices on the European Trading System for December 2006 allowances were in the range of $13-to-$42 per ton (an exchange rate of 1.2723 U.S. dollars per Euro for prices of 9.45-to-30 euros per metric ton) for the period March 2005 to Nov. 7, 2006. International discussions on a $CO_2$ treaty for the post-2012 period have just begun.

If the Commission views this scenario as useful for judging the reasonableness of the final short list of proposals, then the Commission's order approving the RFP should indicate this scenario should be performed in the modeling of the initial short list of proposals.

**Summary**

- The Commission should indicate that it views the renewable resource commitment from the merger (UM 1029 Commitment O26a) as a floor for renewable acquisition, that capacity credits should be for a mix of renewable resources and that more realistic wind equipment lifetimes should be used. PacifiCorp's request for acknowledgement of the final short list of proposals should include a demonstration of the correct level and type of renewable resource acquisitions outside the RFP.

- PacifiCorp's request for acknowledgement should include analyses that indicate the final short list of proposals has the appropriate ramp rate capabilities for integrating wind resources and that the decision criteria appropriately consider the benefits of smaller-sized generating units.

- PacifiCorp's request for acknowledgement should include the types of scenarios and critical value analyses that clarify the implications of alternative input assumptions, particularly CO2 cost adders.

DATED this 9th day of November 2006.

Respectfully submitted,

HARDY MYERS
Attorney General

/s/ *Janet L. Prewitt*
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CERTIFICATE OF SERVICE

I hereby certify that on the 9th day of November 2006, I served the foregoing REPLY COMMENTS OF THE OREGON DEPARTMENT OF ENERGY, upon, the persons named on the attached service list, by mailing a full, true and correct copy thereof addressed to the persons at the addresses on the UM 1208 service list (with the exception of those parties having waived paper service).

DATED: November 9, 2006.

/s/ *Janet L. Prewitt*

Janet L. Prewitt, #85307
Assistant Attorney General

| System | Nameplate MW | % of MW | Capacity Credit | Weighted Capacity Credit | Capacity Factor | Weighted Capacity Factor |
|---|---|---|---|---|---|---|
| Hydro-upgrades | 102.0 | 18.1% | 1.00 | 0.181 | 0.35 | 0.063 |
| Biomass | 21.6 | 3.8% | 0.90 | 0.034 | 0.85 | 0.033 |
| Geothermal | 85.0 | 15.1% | 1.00 | 0.151 | 0.85 | 0.128 |
| Wind | 355.0 | 63.0% | 0.20 | 0.126 | 0.35 | 0.220 |
| Total | 563.6 | 100.0% | | **0.492** | | **0.445** |

| | |
|---|---|
| Avg. Capacity Credit | 0.492 |
| Avg. Capacity Factor | 0.445 |

MW Data from http://edocs.puc.state.or.us/efdocs/HAD/um1209had155918.pdf
Capacity Credits for geothermal and wind from spreadsheet “OPUC a-1(1st supplement)” from OPUC data request #48
Biomass capacity credit and all Capacity (energy) Factors from ODOE

| East Side | Nameplate MW | % of MW | Capacity Credit | Weighted Capacity Credit | Capacity Factor | Weighted Capacity Factor |
|---|---|---|---|---|---|---|
| Hydro-upgrades | | 0.0% | 1.00 | 0.000 | 0.35 | 0.000 |
| Biomass | | 0.0% | 0.90 | 0.000 | 0.85 | 0.000 |
| Geothermal | 76.0 | 47.2% | 1.00 | 0.472 | 0.85 | 0.401 |
| Wind | 85.0 | 52.8% | 0.20 | 0.106 | 0.35 | 0.185 |
| Total | 161.0 | 100.0% | | **0.578** | | **0.586** |

| | |
|---|---|
| Avg. Capacity Credit | 0.578 |
| Avg. Capacity Factor | 0.586 |

MW from "wind" tab of spreadsheet “OPUC a-1(1st supplement)” from OPUC data request #48
Capacity Credits for geothermal and wind from spreadsheet “OPUC a-1(1st supplement)” from OPUC data request #48
Biomass capacity credit and all capacity (energy) factors from ODOE

**From "wind" tab of "OPUC a-1 (1st supplement)" from PAC response to OPUC data request #48** (except green shaded cells)

| MW | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2003 IRP (nameplate)** | | | | | | | | | | | |
| East | 200 | 400 | 400 | 600 | 600 | 700 | 700 | 700 | 700 | 700 | |
| West | 300 | 300 | 500 | 500 | 700 | 700 | 700 | 700 | 700 | 700 | |
| | | | | | | | | | | | |
| **East** | | | | | | | | | | | |
| Schwendiman | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | wind |
| Wolverine Creek | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | wind |
| Blundell upgrades | 0 | 11 | 11 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | geothermal |
| Cove Fort | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | geothermal |
| **East Total** | 118 | 129 | 129 | 161 | 161 | 161 | 161 | 161 | 161 | 161 | |
| | | | | | | | | | | | |
| **West** | | | | | | | | | | | |
| Combine Hills | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | |
| MEHC_SEWA1 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| MEHC_NCOR1 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| MEHC_NCOR2 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| **West Total** | 341 | 341 | 341 | 341 | 341 | 341 | 341 | 341 | 341 | 341 | |
| | | | | | | | | | | | |
| **2006 IRP (nameplate)** | | | | | | | | | | | |
| East | 82 | 271 | 271 | 439 | 439 | 539 | 539 | 539 | 539 | 539 | |
| West | -41 | -41 | 159 | 159 | 359 | 359 | 359 | 359 | 359 | 359 | |
| Total | | | | | | | | | | 898 | |
| | | | | | | | | | | | |
| **2006 IRP (20%)** | | | | | | | | | | | |
| East | 16 | 54 | 54 | 88 | 88 | 108 | 108 | 108 | 108 | 108 | |
| West | 0 | 0 | 32 | 32 | 72 | 72 | 72 | 72 | 72 | 72 | |
| Total | | | | | | | | | | 180 | |

| | |
|---|---|
| **ODOE analyses (see "factors-rr-plan" tab for capacity credit factors)** | |
| **Capacity Credit from mix of PAC's System Commitment 0-26a from UM 1209** | |
| **East** | 265 |
| **West** | 177 |
| | |
| **East Capacity Credit based on mix in rows 7-10 above** | 311 |