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November 19, 2014

Via Electronic Filing

OREGON PUBLIC UTILITY COMMISSION
ATTENTION: FILING CENTER
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**RE: Docket No. UM 1610 – In the Matter of
PUBLIC UTILITY COMMISSION OF OREGON
Staff Investigation Into Qualifying Facility Contracting and Pricing.**

Enclosed for electronic filing in the above-captioned docket is the Public Utility Commission Staff's Response Testimony.

/s/ Kay Barnes

Kay Barnes

Filing on Behalf of Public Utility Commission Staff

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**PUBLIC UTILITY COMMISSION
OF OREGON**

UM 1610

STAFF RESPONSE TESTIMONY OF

BRITTANY ANDRUS

**In the Matter of
PUBLIC UTILITY COMMISSION OF OREGON
Staff Investigation Into Qualifying Facility
Contracting and Pricing.**

November 19, 2014

CASE: UM 1610
WITNESS: BRITTANY ANDRUS

**PUBLIC UTILITY COMMISSION
OF
OREGON**

STAFF EXHIBIT 400

Response Testimony

November 19, 2014

1 **Q. Please state your name, occupation, and business address.**

2 A. My name is Brittany Andrus. My business address is 3930 Fairview Industrial
3 Dr. SE., Salem, Oregon 97302-1166.

4 **Q. Please describe your educational background and work experience.**

5 A. My Witness Qualification Statement is found in Exhibit Staff/301.

6 **Q. What is the purpose of your testimony?**

7 A. The purpose of my testimony is to respond to the main points raised in other
8 parties' opening testimony, and to provide additional information on the history
9 of the Commission's policy regarding the calculation of capacity payments to
10 QFs.

11 **Q. Did you prepare an exhibit for this docket?**

12 A. Yes. I prepared Exhibit Staff/401, consisting of 1 page.

13 **Q. Please summarize the issue.**

14 A. In Phase I of this general investigation into implementation of the Public Utility
15 Regulatory Policy Act (PURPA), the Commission modified the calculation of
16 standard renewable and standard non-renewable avoided cost prices to take
17 into account the capacity contribution of different types of Qualifying Facility
18 (QF) resources for prices paid to QFs during the utilities' deficiency periods.
19 Prior to the Commission's order in Phase I, standard avoided cost prices were
20 based on the assumption that each QF had the same contribution to meeting
21 peak load as the avoided resource, which is a combined cycle combustion
22 turbine (CCCT) for standard non-renewable avoided cost prices and a wind
23 farm for standard renewable avoided cost prices. For standard non-renewable

1 avoided cost prices, this generally meant that intermittent resources, which do
2 not reliably generate in all on-peak hours, were over compensated for capacity.

3 For standard renewable avoided cost prices, this would have meant that both
4 solar and baseload QFs would have been under compensated for capacity
5 because they have a greater contribution to meeting peak load than the
6 avoided wind resource.

7 After the Commission issued Order No. 14-058, Obsidian Renewables, LLC
8 (Obsidian) asked the Commission to clarify its order regarding the capacity
9 contribution adjustment for standard renewable avoided cost prices, and in the
10 alternative, reconsider it. Obsidian noted that in the case of the renewable
11 standard avoided cost rate, discounting the volumetric, dollars-per megawatt-
12 hour rate for capacity to account for the hours a solar QF operated, and then
13 effectively making that adjustment again by only paying the solar QF in the
14 hours it operated, results in an unintended double discount that
15 undercompensates the solar QF for capacity.

16 In response to Obsidian's motion, Staff agreed that there appears to be a flaw
17 in the newly-adopted methodology that could result in undercompensating a
18 solar QF for capacity. Staff asked the Commission to allow opportunity to
19 address the issue in the compliance filings following Order No. 14-058. Staff
20 subsequently suggested to parties that the parties address the issue in Phase II
21 of Docket No. UM 1610, but on an accelerated basis, in order to avoid further
22 delay in the implementation of new avoided cost prices.

1 **Q. What are parties' positions regarding modifying the capacity contribution**
2 **adjustment calculation?**

3 **A.** Staff and the Oregon Department of Energy (ODOE) recommend that the
4 Commission modify the capacity contribution methodology to address the
5 "second discount" issue identified by Obsidian. Staff has discussed its
6 recommended fix with the parties in previous workshops, and Obsidian states
7 in its testimony that it is not opposed to the type of modification that Staff
8 proposes.¹ OneEnergy Renewables supports the testimony of Obsidian.
9 Portland General Electric (PGE), PacifiCorp, and Idaho Power Company (Idaho
10 Power) (together, the utilities) oppose any change to the capacity contribution
11 adjustment, asserting that the calculation described in Staff's testimony in
12 Phase I of UM 1610 and adopted by the Commission in Order No. 14-058 is
13 consistent with the two-step process that the Commission has always used to
14 calculate volumetric avoided cost prices.

15 **Q. How are QFs compensated for capacity?**

16 **A.** Before Order No. 14-058, solar QFs received the same rate per MWh, or
17 volumetric rate, as a baseload QF resource. The solar QF received only a
18 portion of the total annual capacity cost, however, because the QF only
19 received the rate in the hours in which it generated.²

20 Under Order No. 14-058, QFs are still paid in the hours in which they generate,
21 but the dollar-per-megawatt hour rate that has been calculated for capacity is

¹ Obsidian/100, Brown/7-8.

² Some of the on-peak hours are at night or during cloudy weather when a solar QF cannot produce energy, and some of the on-peak hours have little wind and therefore little or no wind QF production.

1 adjusted to reflect the capacity contribution of the QF resource type (sourced
2 from the utility's IRP). This calculation was intended to adjust the capacity
3 payment for the differences in contribution to peak (CTP) provided by resources
4 such as solar and wind.

5 **Q. How was the volumetric capacity rate described above determined prior**
6 **to Order No. 14-058?**

7 A. First the capacity-related portion of the CCCT annual cost in dollars is
8 estimated based on the fixed cost of a single-cycle combustion turbine (SCCT).
9 The annualized cost of capacity is then converted to a dollar-per-megawatt-
10 hour ("MWh") rate by dividing the annual capacity-related cost by the product of
11 the number of on-peak hours in a year and the on-peak capacity factor (i.e.,
12 [annual fixed costs of SCCT ÷ (8,760 annual hours x 57 percent x 91.8 percent
13 on-peak capacity factor)]). This step spreads the annual cost evenly over the
14 assumed MWh of on-peak operation of the CCCT.

15 **Q. What is the flaw with the proposed adjustment Staff put forth in Phase I?**

16 A. As noted above, the Staff adjustment in Phase I of Docket No. UM 1610 (i.e.,
17 the "current method") reduces the volumetric capacity **rate** by a fraction
18 representing the QF's relative contribution to capacity. However, because the
19 volumetric rate is specifically designed to spread the cost of capacity over a
20 number of MWh as if the QF's on-peak capacity factor is equivalent to a
21 CCCT's, it is impossible for an intermittent resource that cannot operate in all
22 those hours to receive all of the capacity dollars to which it is entitled.

1 **Q. Please explain Staff's proposal and how it differs from the method used**
2 **prior to Order No. 14-058 and the current method.**

3 A. Prior to Order No. 14-058, a QF of any technology type was paid the full rate
4 per MWh for capacity in any on-peak hours in which it generated. Using the
5 representative calculations in Staff/401, this would result in annual payments of
6 approximately \$42,000 per year per MW to a solar QF. A baseload resource
7 would have been paid approximately \$140,000 annually per MW. So, under
8 the pre-Order No. 14-058 methodology, the solar QF with an on-peak capacity
9 factor of 27.5 percent would have received 30 percent of the dollars per MW
10 that were paid to a baseload resource.

11 Under the current method, the same solar QF would receive just under \$4,000
12 annually for capacity, or less than three percent of the capacity payments to a
13 baseload resource.³ This is far below the value of the incremental contribution
14 to peak using the 9.4 percent incremental capacity the solar QF brings relative
15 to the wind avoided resource.

16 Under Staff's proposal, the solar QF would be expected to incrementally
17 receive \$13,190, or 9.4 percent of the capacity payment a baseload QF would
18 expect during the same period. The 9.4 percent number represents the
19 incremental portion of capacity for the solar QF relative to the avoided
20 renewable resource. Staff Exhibit 401 shows the avoided wind resource
21 contribution to peak (CTP) of 4.2 percent, the solar CTP of 13.6 percent, and

³ This is under the standard renewable avoided cost method.

1 the difference of 9.4 percent. The dollar-per-MWh rate is calculated using the
2 on-peak capacity factor for a solar resource.

3 **Q. Please explain the on-peak capacity factors.**

4 A. For a solar resource, the on-peak capacity factor is determined by multiplying
5 the total solar output by the percentage share that occurs in on-peak hours, and
6 dividing by the number of on-peak hours in a year. The representative on-peak
7 capacity factor calculation for 1 MW of solar is [(total solar output x on-peak
8 percentage of output) ÷ total on-peak hours], or [(1,607 MWh x 84.1%) ÷ 4,993]
9 = 27.5%.

10 For a CCCT, the on-peak capacity factor of 91.8 percent is calculated by
11 dividing the annual capacity factor (52.3 percent) by the ratio of on-peak hours
12 in a year (57 percent).

13 **Q. What is the technical issue in dispute?**

14 A. The dispute turns on whether the capacity value of the CCCT should be
15 discounted after it has been converted into a dollar-per-megawatt hour
16 volumetric rate that is designed to be recovered if the resource operates in all
17 on-peak hours of the year, as it is now, or whether the capacity value of the
18 CCCT should be discounted prior to conversion into a volumetric rate (CCCT
19 fixed cost expressed in dollars x the incremental QF capacity contribution).

20 The utilities assert that departing from the method in Order No. 14-058 would
21 mean they are paying more than their avoided costs. ODOE and Obsidian
22 assert, and Staff agrees, that spreading a discounted rate to all on-peak hours,

1 and only paying the QF in the hours it generates, will undercompensate the
2 solar QF for its capacity contribution.

3 **Q. Why is it appropriate to create a volumetric rate for an intermittent QF that**
4 **allows the intermittent resource an opportunity to recover the full avoided**
5 **cost associated with its contribution to peak?**

6 A. The answer to this question turns on the rationale underlying the Commission's
7 decision to modify the calculation of the standard avoided cost rates. In
8 Phase I, Staff recommended a departure from the traditional calculation of
9 avoided cost prices to take into account characteristics of the QF. Generally,
10 avoided cost prices are based on the costs (and characteristics) of the avoided
11 resource, not the QF. In Phase I, Staff recommended that the Commission
12 modify the standard avoided cost price methodologies to replace the value of
13 the utility's avoided resource's contribution to peak with that of different
14 resource types, thereby creating different standard avoided cost price streams
15 that are differ by resource type.

16 As noted in testimony in Phase I, the Commission has previously not taken
17 particular characteristics of QFs into account in setting standard rates. Staff
18 recommended that the Commission do so to recognize the different capacity
19 contributions of intermittent resources primarily to avoid overcompensating
20 intermittent resources for capacity. Staff did not, however, recommend
21 implementing a methodology that significantly undercompensated intermittent
22 QFs for their capacity contribution.

1 In order to recognize the full value of the solar QF's contribution to peak it is
 2 necessary to adjust the calculation so that the cost of capacity is not spread
 3 over all peak hours (as is done for a baseload resource that is assumed to
 4 operate in all peak hours when developing the volumetric rate), but is spread to
 5 a subset of hours.

6 **Q. Please explain how Staff's proposal is consistent with the method for**
 7 **determining avoided cost capacity payments to QFs in Oregon.**

8 A. The basic principle for determining the per-on-peak MWh relevant capacity
 9 payment is to divide the relevant capacity entitlement by the total amount of on-
 10 peak MWh. The following examples demonstrate that Staff's proposal is
 11 consistent with this principle.

12 For CCCT

13 **Determine capacity entitlement**

14 Annual fixed cost of an SCCT: \$140,320

15 Contribution to peak of CCCT: 100%

16 **Capacity entitlement of CCCT:** $\$140,320 \times 100\% = \$140,320$

17 **Determine rate**

18 On-peak capacity factor of a CCCT: 91.8%

19 On-peak hours in a year: 4,993

20 **Rate:** $\$140,320 \div (4,993 \times 91.8\%) = \30.61 per MWh

21 For solar:

22 **Determine capacity entitlement**

23 Annual fixed cost of an SCCT: \$140,320

24 Contribution to peak of solar: 13.6%

25 Contribution to peak of avoided renewable resource (wind): 4.2%

| | | |
|---|---|--|
| 1 | Incremental contribution to peak of solar above avoided resource: | 9.4% |
| 2 | Capacity entitlement of solar: | $\$140,320 \times 9.4\% = \$13,190$ |
| 3 | Determine rate | |
| 4 | On-peak capacity factor of solar: | 27.5% |
| 5 | On-peak hours in a year: | 4,993 |
| 6 | Rate: | $\$13,190 \div (4,993 \times 27.5\%) = \9.60 per MWh |

7 **Q. What is your response to the position taken by PacifiCorp and Idaho**

8 **Power that the method required under Order No. 14-058 is correct**
 9 **because it has been in place in Oregon for several years?**⁴

10 A. The method that has been used for several years is based on thermal
 11 resources, and allocates costs based on assumptions for operating
 12 characteristics of thermal resources. In Order No. 14-058, the Commission
 13 modified the method for determining the value of capacity for the purpose of
 14 calculating avoided costs so that, for the first time, it takes into account the
 15 value created by resources with different operating characteristics. Using a
 16 volumetric rate based on an assumed production level for a thermal resource is
 17 not the correct starting point for calculating an adjusted capacity payment.
 18 Rather, the correct starting point is the value of the capacity brought to the
 19 utilities' systems for the QF technology type. In order to avoid the use of
 20 incorrect assumptions in a volumetric rate, the dollar per unit of capacity, per
 21 year, is the appropriate starting point for calculating the QF capacity payment.

⁴ PAC/600, Duvall/6, 16-18: "In reality, this is not a discount from avoided costs at all; rather, it is simply the result of the proxy-method's two-step process that has been in place for Oregon QFs for many years."

Idaho Power/600, Youngblood/16, 23-24: "The fact that these payments are made on heavy load hours is the same as it has always been, and is not a 'second discount,' but an appropriate reflection of each utility's need for capacity."

1 **Q. Does this conclude your testimony?**

2 A. Yes.

3

CASE: UM 1610
WITNESS: BRITTANY ANDRUS

**PUBLIC UTILITY COMMISSION
OF
OREGON**

STAFF EXHIBIT 401

**Exhibit in Support
Of Response Testimony**

November 19, 2014

Exhibit 401

I. Method prior to Order No. 14-058

| a | | b | | c | | d | | e | | f | |
|--|--------------|---------------------------------------|-------|-------------------------|--|---------------------|--|---------------|--|---|--|
| SCCT Fixed Costs | | Proxy Resource: CCCT | | | | | | Capacity Rate | | | |
| Annual energy weighted capacity factor | | On-peak hours percent of annual hours | | On-peak capacity factor | | | | | | | |
| \$/kW-Yr | \$/MW-Yr | | | | | | | | | | |
| a | b = a * 1000 | c | d | e = c / d | | f = b / (8,760*d*e) | | | | | |
| \$140.32 | \$ 140,320 | 52.3% | 57.0% | 91.8% | | \$ 30.61 | | | | | |

Annual capacity payments per MW, baseload resource*: \$ 140,250
*difference between \$140,320 and \$140,250 is due to rounding

Solar on-peak capacity factor: 27.5%
Annual capacity payments per MW, solar QF resource: \$ 42,033

II. Current method

| g | | h | | i | | j | | k | | l | | m | | n | | o | |
|--|-------|--|--|--|--|--|--|-----------------------|--|-------------------------|--|---------------|--|--|--|---|--|
| Capital cost allocated to capacity (on-peak hours) | | Renewable proxy resource (wind) contribution to peak | | Solar QF resource contribution to peak | | QF incremental capacity contribution to peak | | On-peak capacity rate | | On-peak capacity factor | | On-peak hours | | Sum of annual capacity payments per 1 MW solar | | Percent of capacity payments to baseload resource | |
| \$/MWh | | | | | | % | | \$/MWh | | | | m = d * 8,760 | | n = k * l * m | | o = n / b | |
| g = f | | | | | | j = l - h | | k = g * j | | | | | | | | | |
| \$ | 30.61 | 4.2% | | 13.6% | | 9.4% | | \$2.88 | | 27.5% | | 4,993 | | \$ 3,951 | | 2.8% | |

III. Staff-proposed method (option 1, capacity payment on all on-peak hours)

| r | | s | | t | | u | | v | | w | | x | | y | |
|------------------------|---------|--|--|--|--|--|--|-------------------|--|-----------------------|--|--|--|---|--|
| Fixed Cost of Capacity | | Renewable proxy resource (wind) contribution to peak | | Solar QF resource contribution to peak | | QF incremental capacity contribution to peak | | QF capacity value | | On-peak capacity rate | | Sum of annual capacity payments per 1 MW solar | | Percent of capacity payments to baseload resource | |
| \$/MW-yr | | | | | | % | | \$/MW-yr | | \$/MWh | | | | | |
| r = b | | | | | | u = t - s | | v = r * u | | w = v / (l * m) | | x = w * l * m | | y = x / b | |
| \$ | 140,320 | 4.2% | | 13.6% | | 9.4% | | \$13,190 | | \$ 9.61 | | \$ 13,190 | | 9.4% | |

CERTIFICATE OF SERVICE

UM 1610

I certify that I have, this day, served the foregoing document upon all parties of record in this proceeding by delivering a copy in person or by mailing a copy properly addressed with first class postage prepaid, or by electronic mail pursuant to OAR 860-001-0180, to the following parties or attorneys of parties.

Dated this 19th day of November, 2014 at Salem, Oregon



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