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November 19, 2014

VIA ELECTRONIC FILING & U.S. MAIL

Oregon Public Utility Commission
Attn: Filing Center
P.O. Box 1088
Salem, Oregon 97308-1088

Re: In the Matter of Public Utility Commission of Oregon Investigation Into Qualifying Facility Contracting and Pricing -- Phase II
Docket No. UM-1610

Dear Filing Center:

Enclosed for filing please find the original and five (5) copies of the Response Testimony of David W. Brown along with Exhibit 301 on behalf of Obsidian Renewables, LLC in the above-referenced docket.

Thank you for your assistance with this filing. Should you have any questions, please feel free to contact me.

Very truly yours,

/s/ Chad M. Stokes

Chad M. Stokes

CMS:tjb
Enclosures
c: UM-1610 Service List

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

RESPONSE TESTIMONY OF DAVID W. BROWN

ON BEHALF OF

OBSIDIAN RENEWABLES, LLC

NOVEMBER 19, 2014

Q. PLEASE STATE YOUR NAME, AND CURRENT EMPLOYMENT POSITION OR TITLE.

A. My name is David W. Brown. I am the Owner of Obsidian Renewables LLC ("Obsidian"). My testimony is based on my personal knowledge gained through my experience as a developer of solar and other renewable generating facilities.

Q. DID YOU PROVIDE OPENING TESTIMONY CONCERNING THE CAPACITY PAYMENT FOR RENEWABLE SOLAR QF PROEJCTS?

A. Yes.

Q. PLEASE BREIFLY SUMMARIZE YOUR OPENING TESTIMONY?

A. In my opening testimony, I explained how Staff's original proposal in Phase I of UM 1610 concerning the calculation of a capacity payment to renewable solar QF projects would result in an inadvertent double discount to the total capacity payment amount. The capacity payment paid to solar renewable QF projects would be discounted once in the calculation of the resource-specific capacity rate, and then it would be discounted again by only applying that rate for a subset of high-load or peak hours.

My recommendation was for the Commission to use Staff's *revised* proposal as the basis for calculating the capacity payment for renewable solar QF projects. I agreed with Staff's revised position that the purchasing utility's avoided capacity cost should be multiplied by the renewable solar QF project's capacity value to determine a target annual capacity payment amount. I also agreed that the target annual capacity payment should be the basis of the volumetric rate paid to the renewable solar QF project. In terms of the volumetric rate design, I recommended an adder to the project's peak energy payment that is based on the target annual payment amount divided by the renewable solar QF project's expected annual hours of production during high load hours.

In order to properly implement Staff's revised proposal, I also recommended that the Commission require the purchasing utilities to calculate the solar capacity value—or

"CTP" in the Staff proposal—using the industry standard ELCC method (or an accepted approximation of that method).

Q. HAVE YOU REVIEWED THE OPENING TESTIMONY FILED BY OTHER PARTIES ON THIS ISSUE?

A. Yes. I have reviewed the opening testimony on this issue provided on November 4, 2014, by the Commission Staff, the Oregon Department of Energy ("ODOE"), PacifiCorp, Portland General Electric ("PGE") and Idaho Power. I have also reviewed the comments filed by OneEnergy, Inc. in support of Obsidian's opening testimony.

Q. AFTER REVIEWING THE OTHER PARTIES' TESTIMONY, DO YOU STILL BELIEVE THAT THERE IS A "DOUBLE DISCOUNT" ISSUE WITH STAFF'S ORIGINAL CAPACITY PAYMENT PROPOSAL?

A. Yes. In fact, my testimony concerning the double discount issue is confirmed by the testimony of Staff and ODOE on this issue. Both Staff and ODOE explain that the "double discount" problem in the original Staff testimony arises from the fact that the original methodology starts with the calculation of a discounted capacity *rate* for renewable solar QF projects, rather than starting from a total annual capacity value. *See* Staff/300; Andrus/7-9; ODOE/600; Brockman/2. Staff and ODOE further explain that by starting from a discounted rate, and then applying it as an adder to the renewable solar QF projects energy payment amount, the total capacity payment to the renewable solar QF project ends up being disproportionately low. *Id.* By starting with the total annual capacity value, however, the volumetric rate can be designed so as to avoid a double discount. *Id.*

Q. IN THEIR OPENING TESTIMONY, DO THE PURCHASING UTILITIES AGREE THAT THERE IS AN INAPPROPRIATE DOUBLE DISCOUNT OF THE RENEWABLE SOLAR QF CAPACITY PAYMENT?

A. No. Despite the fact that Staff now readily agrees that its own original proposal was flawed and included an unintentional double-discount of the renewable solar capacity payment, the purchasing utilities cling to the position that the original Staff proposal was

correct. *See generally,* PGE/400; Macfarlane/3; Idaho Power/600; Youngblood/16; PAC/600, Duvall/10.

Q. DID THE PURCHASING UTILITIES OPPOSE OBSIDIAN'S MOTION FOR CLARIFICATION?

A. No. None of the purchasing utilities that now "support" the Staff's original proposal ever opposed Obsidian's Motion for Clarification. That is to say, none of the purchasing utilities previously disputed Obsidian's interpretation of Staff's original proposal.

Q. WHY WOULD THE PURCHASING UTILITIES NOW ADVOCATE FOR STAFF'S INITIAL CAPACITY PAYMENT PROPOSAL?

A. In my view, the purchasing utilities are now simply advocating for the calculation methodology that will produce the lowest possible capacity payment to renewable solar QF projects. As for-profit corporations, the purchasing utilities naturally seek to reduce their operating expenses as much as possible. They also have an economic incentive to underestimate the capacity contribution of QF projects in order to increase the opportunity to invest capital in their own capacity resources and earn a rate of return on such investments. In other words, it is a rational economic decision for the utilities to seek to reduce the capacity payments to QF projects, but that does not mean their position is necessary "correct" or even logically sound.

Q. DOES THE TESTIMONY OF PACIFICORP SUPPORT THE CONCULISION THAT THERE IS NO DOUBLE DISCOUNT OF THE RENEWABLE SOLAR QF CAPACITY PAYMENT?

A. No, it does not. In fact, PacifiCorp's testimony actually admits that the compensation paid to a renewable solar QF project under Staff's original methodology would be disproportionately low as compared to the renewable solar QF project's contribution to PacifiCorp's capacity requirements. The Opening Testimony of Gregory N. Duvall explains that a solar QF project having an assumed capacity contribution of 13.6% should only be paid "5.4 percent of the proxy CCCT capacity costs." PAC/600, Duvall/7. Mr. Duvall further testifies that if a renewable solar QF project were assumed to have a

capacity contribution of 39.5%, it would be "senseless" to pay such project 39.5% of the CCCT capacity costs. *Id.* Thus, PacifiCorp's testimony suggests that the compensation paid to a renewable solar QF project *should* be disproportionately low in comparison to the amount of capacity that it actually provides.

Q. DOES THE TESTIMONY OF IDAHO POWER SUPPORT THE CONCULISION THAT THERE IS NO DOUBLE DISCOUNT OF THE RENEWABLE SOLAR QF CAPACITY PAYMENT?

A. No. Whereas PacifiCorp argues in favor of the double discount, Idaho Power tries to make the case that there actually is no double discount. Idaho Power explains that its avoided cost of capacity from its proxy resource is $13.62 per MWh. The capacity contribution of solar is 32% of the capacity contribution of the proxy resource, so the rate paid to the solar project should be 32% of $13.62, which is $4.36. Idaho Power/600, Youngblood/13. Thus, Idaho Power concludes that $4.36 is the appropriate adder to on-peak generation of the solar QF project, and this is consistent with Staff's original proposal. As I explain below, however, Idaho Power's own mathematical examples show that $4.36 is only the appropriate adder if it is added to *all* on-peak hours, not just the hours of production.

The error with Idaho Power's stated conclusion is clearly revealed in Idaho Power's own mathematic examples. *See generally,* Idaho Power/600; Youngblood/14. Idaho Power's mathematical example shows that the annual capacity cost of the proxy resource is calculated as follows: $13.62 X 4,862 on-peak hours = $66,220.44 per MWh. *Id.* Idaho Power then explains the annual capacity cost of solar resource is calculated as follows: $\underline{13.62}$ X 4,862 on-peak hours X 32% (capacity contribution of solar) = $21,190.54. *Id.* The interesting thing here is that Idaho Power's example actually correctly calculates the solar project's total annual capacity cost because it uses the full capacity value of $13.62 (and not the discounted rate of $4.36) multiplied by a discounted number of on-peak hours (32% of all on-peak hours)! If Idaho Power's example had

followed Staff's original proposal, however, the equation would have looked like this: $4.36 X 4,862 on-peak hours X 32% = $6,780.97—or, stated slightly differently for illustrative purposes: $13.62 X 32% X 4,862 on-peak hours X 32% = $6,780.97. In its own example, however, Idaho Power actually applied only a single discount and calculated the correct annual capacity cost of $21,190.54, rather than applying a double-discount as advocated by PacifiCorp to calculate a disproportionately low annual capacity value of $6,780.97.

Idaho Power then *confirms* this analysis in the next paragraph by moving the discount factor of 32% from the total number of on-peak hours to the hourly capacity rate. *Id.* Idaho Power testifies that "[a]nother way of viewing this is that the total annual capacity cost for the solar QF is $21,190.54 per MW, and if that amount were spread over all 4,862 on-peak hours, the result would be a $4.36 per MWh capacity adder [$21,190.54 per MW ÷ 4,862 on-peak hours = $4.36 per MWh]" (Emphasis added). *Id.* Again, Idaho Power's example is exactly right! If you discount the capacity rate to account for the lower capacity value of the renewable solar QF resource, then you must spread that discounted rate over all on-peak hours in order to get the correct annual payment amount. This is precisely what Obsidian pointed out in its April 24, Motion for Clarification. Idaho Power's own examples clearly show how the math works only if you discount *either* the capacity rate *or* the number of on-peak hours to which the rate is applied, *but not both.*

Going back to PacifiCorp's Opening Testimony, you will recall that PacifiCorp argues that it would be "senseless" to pay a solar project with a capacity value of 39.5% a capacity payment that is equal to 39.5% of the capacity cost of the proxy resource. PAC/600, Duvall/7. In Idaho Power's testimony, however, a solar QF project having a capacity value of 32% would, in fact, receive a capacity payment that is 32% of the capacity cost of the proxy resource. Idaho Power/600; Youngblood/14. As I explain

above, Idaho Power computes the annual capacity cost of the proxy resources to be $66,220.44 per MW. *Id.* Idaho Power then determines the total annual capacity cost of a solar QF with a 32% capacity value to be $21,190.54. *Id.* Not surprisingly, the amount paid to the solar QF ($21,190.54) is precisely 32% of capacity cost of the proxy resource ($66,220.44). Idaho Power's own mathematical example yields the exact outcome that PacifiCorp colorfully dismisses as "senseless."

Q. DOES THE TESTIMONY OF PGE SUPPORT ITS CONCULISION THAT THERE IS NO DOUBLE DISCOUNT OF THE RENEWABLE SOLAR QF CAPACITY PAYMENT?

A. No. PGE's opening testimony simply provides the conclusory statement that it agrees with Staff's original proposal without explanation as to why there is or is not a "double discount." *See generally* PGE/400; Macfarlane/3. As with both PacifiCorp and Idaho Power, PGE's opening testimony conveniently ignores the fact that even Staff itself now agrees that its original proposal requires modification.

Q. DOES OBSIDIAN ADVOCATE THAT THE CAPACITY PAYMENT SHOULD BE PAID AS A FIXED DOLLAR AMOUNT RATHER THAN ON A PER MWh BASIS?

A. No. The recommendation in my opening testimony was quite clear in that the properly calculated capacity payment should be paid as an adder to the on-peak energy rate consistent with Staff's revised proposal. I am aware, however, that the purchasing utilities attribute to Obsidian, either directly or indirectly, the notion that the capacity payment should be a fixed dollar amount. *See* PGE/400; Macfarlane/5; Idaho Power/600; Youngblood/15; PAC/600, Duvall/8.

I believe that this is merely a straw-man argument that the purchasing utilities have collectively devised based on a misunderstanding of Obsidian's April 24, 2014 Motion for Clarification. In the Motion, Obsidian explained how there is a double discount when the lower capacity value of a solar resource is reflected both in the capacity rate and in the number of hours to which that rate is paid. Obsidian explained

that *if* there is to be a discounted capacity rate, then the rate must be paid in all on-peak hours rather than only those hours in which the project is delivering energy. This point is precisely what Idaho Power demonstrates in the mathematical examples used in its own opening testimony, as I have explained above. *See* Idaho Power/600; Youngblood/14.

In the alternative, if the capacity payment is paid as an adder to the energy payment, then the capacity rate must be calculated based on the full annual capacity value of the resource. This point also is confirmed by Idaho Power in its opening testimony. *Id.* I believe that this is essentially what Staff's revised proposal attempts to accomplish, and that is also the recommendation in my opening testimony.

Q. HAVE YOU REVIEWED STAFF'S OPENING TESTIMONY REGARDING ITS REVISED PROPOSAL FOR CALCULATING CAPACITY PAYMENTS?

A. Yes.

Q. WHY DOES STAFF CHARACTERIZE ITS REVISED PROPOSAL AS A TWO-STEP PROCESS, WHEREAS IN YOUR OPENING TESTIMONY YOU DESCRIBE IT AS A THREE-STEP PROCESS?

A. I believe that Staff has simply combined the first two steps of its revised proposal into a singe step. *See generally* Staff/300; Andrus/9. In its opening testimony, Staff says that it's revised "proposal has two steps: First, determine the value of capacity of a dollars-per-MW-basis. This step is analogous to determining the annual revenue requirement for a capacity resource. Second, determine how to pay those dollars of the course of a year on a dollars-per-MWh basis." *Id.* In my testimony, however, I break Staff's first step down into its two constituent parts. First one must determine the annual capacity cost of the purchasing utility's proxy resource. Next, one must multiply that annual capacity cost by the renewable solar QF project's incremental capacity value, or "CTP" in the Staff proposal.

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Q. DO YOU GENERALLY AGREE WITH THE FIRST STEP OF THE REVISED PROPOSAL SET FORTH IN STAFF'S OPENING TESTIMONY?

A. Yes. As I explained in my opening testimony, I agree that it is appropriate to calculate the purchasing utility's avoided capacity cost on an annual basis and then multiple that dollar amount by the renewable solar QF project's incremental capacity value (or CTP). This results in the target annual capacity payment to the renewable solar QF project.

Q. HOW DOES THE FIRST STEP OF STAFF'S REVISED PROPOSAL DIFFER FROM THE FIRST STEP OF STAFF'S ORIGINAL PROPOSAL?

A. As explained by both Staff and ODOE in their opening testimony, the flaw with Staff's original proposal was that it started with a discounted capacity *rate* that is derived from the number of hours that the avoided resource is expected to operate rather than the number of hours that the renewable solar QF project is expected to operate. *See* Staff/300; Andrus/7-9; ODOE/600; Brockman/2. When this rate is paid only during on-peak hours in which the renewable solar QF project is delivering energy, it results in total annual capacity payments that are disproportionately low. *Id.* In order to fix this flaw, the first step of Staff's revised proposal is to calculate the total annual capacity payment to the renewable solar QF project taking into account both: (i) The purchasing utility's annual avoided capacity costs; and (ii) The renewable solar QF project's incremental capacity value (or CTP). In simple terms, Staff's revised proposal is derived from the target annual capacity payment to the renewable solar QF project rather than an already discounted capacity rate.

Q. DOES THE FIRST STEP OF STAFF'S REVISED PROPOSAL FIX THE DOUBLE-DISCOUNT FLAW THAT HAS BEEN IDENTIFIED IN STAFF'S ORIGINAL PROPOSAL?

A. Yes. Staff's revised proposal corrects the double-discount problem. Staff's revised proposal fixes the problem by ensuring that the total annual capacity payments to the renewable QF project remain proportionate with the avoided capacity costs of the purchasing utility's proxy resource. *See* Staff/300; Andrus/9-10. To use Idaho Power's example, if a renewable solar QF project has an incremental capacity value or CTP of

32%, then Staff's revised proposal ensures that the total annual capacity payments paid are 32% of the annual capacity costs of purchasing utility's proxy project (per MWh).

Q. WHAT IS YOUR UNDERSTANDING OF THE FINAL STEP OF STAFF'S REVISED PROPOSAL?

A. The final step of Staff's revised proposal is to design a volumetric rate that spreads the quantity of dollars determined in the first step over a set number of on-peak hours in which the capacity payment is made to the renewable solar QF project. *See* Staff/300; Andrus/10-13. Staff explains that there are multiple rate design options, and Staff describes two of them. *Id.* In Option 1, the volumetric payment for capacity would be added to the energy payment for each on-peak hour of the year in which the renewable solar QF delivers energy to the purchasing utility. *Id.* In Option 2, the volumetric payment would be made only in those hours having the highest lost of load probability. *Id.* In either case, and this is key, the volumetric rate would be set at a level that is expected to pay the same target capacity dollars over the course of a year. *Id.* at 12.

Q. DO YOU AGREE WITH THE PREMISE THAT THE VOLUMETRIC RATE DESIGN SHOULD PRODUCE PAYMENTS EQUAL TO THE TARGET ANNUAL CAPACITY PAYMENT AMOUNT CALCULATED IN STEP 1?

A. Yes. As explained above, making the capacity rate a function of the total annual capacity value of the renewable solar QF project ensures that the project is neither overcompensated nor undercompensated for capacity.

Q. DOES STAFF MAKE A RECOMMENDATION TO THE COMMISSION AS TO WHETHER IT SHOULD ADOPT OPTION 1 OR OPTION 2?

A. No. As I read Staff's opening testimony, Staff simply lays out the potential advantages and disadvantages of each option without making a recommendation to the Commission.

Q. IN TERMS OF THE VOLUMETRIC RATE DESIGN, DO YOU RECOMMEND OPTION 1 OR OPTION 2?

A. In terms of the volumetric rate design, I recommend a slightly modified version of Staff's Option 1. I believe that Option 1 more closely correlates to the recommendation that I made in my opening testimony. In both Option 1 and my opening testimony

recommendation, the capacity payment would be an adder for all on-peak hours in which the renewable solar QF project generates power. And in each case, the capacity rate is calculated based on the expected number of annual peak hours of generation. I prefer Option 1 for standard contracts, adjusted as I discuss below, because it will be much easier for the utility, QF and the Commission to implement and administer.

The primary difference between my recommendation and Staff's Option 1 is the determination of the renewable solar QF project's expected annual hours of peak generation. Staff's Option 1 proposal is to take all peak hours and multiply them by the on-peak capacity factor of a solar resource. *See* Staff/300; Andrus/10. As I understand Staff's revised proposal, the on-peak solar capacity factor would be derived from the purchasing utility's acknowledged IRP based on a representative single-axis tracking utility scale PV solar facility. *See* Staff/300; Andrus/13.

In my opening testimony, however, I recommend using the expected annual on-peak production hours for each specific solar project. The projected on-peak annual production hours for a project would be based on the project's PVsyst and 8,760 reports. Although our two approaches should yield similar results on average, my approach will yield more precise and accurate results that actually account for project-specific characteristics including design, maintenance and location. My approach would also be based on objectively verifiable data that would not be subject to interpretation or manipulation by the either the developer or the purchasing utility.

Q. DO YOU AGREE WITH STAFF'S RECOMMENDATION TO TAKE ALL INPUTS FOR THE VOLUMETRIC RATE DESIGN FROM THE PURCHASING UTILITIES' ACKNOWLEDGED IRPs?

A. No. Although I do agree that the purchasing utility's acknowledged IRP should be the default source of inputs for the volumetric rate design, I firmly believe that this approach should remain flexible enough to account for known differences between a utility's acknowledged IRP and the "real world."

For example, Staff recommends using the on-peak capacity factor for a solar project taken from the purchasing utility's acknowledged IRP as a basis for calculating the volumetric capacity rate. Staff/300; Andrus/13. For the reasons set forth above, I submit that it would be more accurate and objectively verifiable to use project-specific projections of on-peak generation.

More important, however, is using an accurate measure of the renewable solar QF project's capacity value (CTP). Staff's opening testimony appears to endorse the idea of using the purchasing utilities' capacity value (or CTP) from their acknowledged IRPs. *See* Staff/300; Andrus/13. As I explained in my opening testimony, the solar capacity values stated in both PacifiCorp's and PGE's acknowledged 2013 IRPs are unreasonably low because they are based on a flawed methodology. PacifiCorp's current solar capacity value is 13.6% and PGE's is only 5%. These numbers are unreasonably low because they are based on an Exceedance Method that has been rejected by other state regulators such as the Utah PSC. Without repeating my opening testimony here, the overwhelming weight of the evidence is that the purchasing utilities should use either the ELCC method or an approximation of that method.

Q. FOR PURPOSES OF CALCULATING CAPACITY PAYMENTS, SHOULD THE COMMISSION USE THE SOLAR CAPACITY VALUE THAT HAS BEEN UPDATED BY PACIFICORP FOR ITS 2015 IRP?

A. Yes. I do not believe that it is necessary for the Commission to rigidly adhere to inputs from an acknowledged IRP where: (1) The methodology underpinning those inputs has been squarely rejected by other state regulators; and (2) the utility itself has already updated the inputs using an appropriate methodology.

As I explained in my opening testimony, PacifiCorp has already updated its draft 2015 IRP using an approximation of the ELCC method to comply with the directive of the Utah PSC. PacifiCorp's revised solar capacity value in Oregon is 36.7%. This is the

number that should be used for calculating PacifiCorp's solar capacity payment amount even through the 2015 IRP has not yet been acknowledged.

Q. DOES PACIFICORP USE THE UPDATED SOLAR CAPACITY VALUE FROM ITS 2015 IRP AS THE BASIS FOR DETERMINING AVOIDED COST RATES IN OTHER JURISDICTIONS?

A. Yes. On November 7, 2014, PacifiCorp (dba Rocky Mountain Power) filed for an adjustment of its Schedule 37 avoided costs rates applicable to QF projects in Wyoming. In support of the requested rate adjustment, PacifiCorp offered testimony from Gregory N. Duvall, the same witness that has provided testimony on PacifiCorp's behalf in this proceeding. A copy of the relevant portion of the Direct Testimony of Gregory N. Duvall is attached hereto as Exhibit 301. With respect to capacity contribution of solar resources, Mr. Duvall testified that PacifiCorp recently completed a capacity contribution study in support of its 2015 IRP. The methodology used by PacifiCorp in that capacity study was not the discredited Exceedance Method but the capacity factor approximation method ("CF Method") outlined in a 2012 report by the National Renewable Energy Laboratory. The CF Method is an accepted approximation of the ELCC method. PacifiCorp's CF Method study shows an average capacity value for tracking solar PV of 37.9%. PacifiCorp proposes that the capacity value of 37.9% from its 2015 IRP serve as the basis for any avoided capacity cost payments in Wyoming. I submit that, just as PacifiCorp itself has requested in Wyoming, this Commission should also use PacifiCorp's updated capacity contribution numbers from its 2015 IRP.

Q. FOR PURPOSES OF CALCULATING CAPACITY PAYMENTS, SHOULD THE COMMISSION USE THE ELCC SOLAR CAPACITY VALUE FROM PGE'S 2013 IRP, RATHER THAN THE EXCEEDENCE METHOD CAPACITY VALUE?

A. Yes. As I explained in my opening testimony, PGE's acknowledged 2013 IRP actually calculates the capacity value of a solar resource using both the ELCC and the Exceedance Method. The ELCC method produced a capacity value of 20%, whereas the Exceedance Method produced a capacity value of just 5%. Not surprisingly, PGE simply dismissed

the higher ELCC capacity value and elected to use the much lower Exceedance Method capacity value. For the reasons stated above and in my opening testimony, I urge the Commission to use the ELCC method from PGE's IRP rather than the Exceedance Method. Because the ELCC value of 20% is taken directly from PGE's acknowledged IRP, I believe that this would be consistent with the Staff's recommendation of using inputs from the utility's acknowledged IRPs.

Q. DOES THIS CONCLUDE YOUR TESTIMONY AT THIS TIME?

A. Yes.

Docket No. 20000-___-EA-14
Witness: Gregory N. Duvall

BEFORE THE WYOMING PUBLIC SERVICE COMMISSION

ROCKY MOUNTAIN POWER

Direct Testimony of Gregory N. Duvall

November 2014

Capacity Contribution

Q. What does the Company propose with regard to capacity contribution in Schedule 37?

A. Capacity costs included in the calculation of Schedule 37 rates should be adjusted to reflect the capacity contribution of intermittent wind and solar resources. The capacity contribution of wind and solar resources, represented as a percentage of a resource's nameplate capacity, is a measure of the ability of these resources to reliably meet demand. For purposes of calculating Schedule 37 avoided cost prices, the capacity contribution of a QF resource must be applied to the fixed costs of the deferred proxy CCCT to accurately determine the capacity costs that can be avoided due to the addition of the QF resource.

Q. How is the capacity contribution of wind and solar resources calculated?

A. The Company recently completed a capacity contribution study in support of its 2015 IRP. The Company calculated peak capacity contribution values for wind and solar resources using the capacity factor approximation method ("CF Method") as outlined in a 2012 report produced by the National Renewable Energy Laboratory.[1] A description of the Company's study and the resulting capacity contributions for wind and solar resources are provided as Exhibit RMP___(GND-2). The results of the study show the following capacity contribution levels for wind, fixed-tilt solar, and tracking solar resources.

[1] Madaeni, S. H.; Sioshansi, R.; and Denholm, P. "Comparison of Capacity Value Methods for Photovoltaics in the Western United States." NREL/TP-6A20-54704, Denver, CO: National Renewable Energy Laboratory, July 2012 (NREL Report). http://www.nrel.gov/docs/fy12osti/54704.pdf

Table 3

	Wind			Fixed Solar PV			Tracking Solar PV		
	West	East	Weighted Average	West	East	Average	West	East	Average
Peak Capacity Contribution	25.4%	14.5%	18.1%	32.2%	34.1%	33.1%	36.7%	39.1%	37.9%

The Company proposes to adjust the amount of capacity costs included in avoided costs for wind and solar QFs by their respective capacity contributions. Tables 6A through 6D in Exhibit 3 of the Company's filing show how the adjustment for capacity contribution is made to the avoided cost rates.

Q. What differentiates capacity contribution from capacity factor?

A. The capacity factor of a generating resource is a measure of how much energy that resource is expected to produce over a given period of time. Like capacity contribution, the capacity factor is represented as a percentage of plant capacity; however, the two metrics have entirely different meanings. For example, consider two hypothetical power plants operating at a 50 percent capacity factor. Both plants produce energy at half of their full capability over the course of a year. However, assume one plant achieves a 50 percent capacity factor by producing energy in hours when the probability of reliability events are lowest and the other plant achieves its 50 percent capacity factor by producing energy in hours when the probability of reliability events are highest. The former would have a low capacity contribution value and the latter would have a high capacity contribution value. For Schedule 37 avoided cost rates, the QF's capacity contribution is applied to the capacity costs of the proxy CCCT, reducing the amount paid to an intermittent QF for capacity.

CERTIFICATE OF SERVICE

I hereby certify that I caused to be served the foregoing **RESPONSE TESTIMONY OF DAVID W. BROWN ON BEHALF OF OBSIDIAN RENEWABLES LLC** via electronic mail and, where paper service is not waived, via postage-paid first class mail upon the following parties of record:

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