BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1729

In the Matter of	)	RENEWABLE ENERGY COALITION AND COMMUNITY RENEWABLE ENERGY ASSOCIATION SUPPLEMENTAL COMMENTS
PACIFICORP, dba PACIFIC POWER,	)	
Application to Update Schedule 37 Qualifying Facility Information	)	

I. INTRODUCTION

The Renewable Energy Coalition (the "Coalition") and the Community Renewable Energy Association ("CREA") (collectively "Joint QF Parties") file these comments to supplement previously filed comments on May 11, 2018, and the previously filed response to emergency motion submitted on May 18, 2018, and again reiterate that the Oregon Public Utility Commission (the "Commission") should reject PacifiCorp's application to update its Schedule 37 qualifying facility ("QF") information (the "Compliance Filing") and its Motion for Emergency Relief ("PacifiCorp's Motion"). We will not repeat the thorough comments and regulatory background contained in those prior submittals and instead urge the Commission to review the prior submittals given the passage of time since the last public meeting.

These comments supplement our prior filings on three unresolved issues: 1) PacifiCorp's claim that the costs of the Aelous-to-Bridger/Anticline transmission line should not be included with PacifiCorp's proxy resource costs; 2) PacifiCorp's unilateral discounting of the transmission costs with unexplained transmission benefits; and

3) PacifiCorp's treatment of renewable capacity—relying upon the 2030 non-renewable sufficiency period rather than the 2021 renewable sufficiency period.

PacifiCorp's recently acknowledge integrated resource plan ("IRP") expressly ties the construction of the new transmission line to the acquisition of the new Wyoming wind resources, and that resource therefore constitutes the avoidable renewable resource for purposes of calculating the renewable avoided costs. Likewise, PacifiCorp's renewable deficiency period[1] commences in 2021 when the Wyoming resource is planned to be online, and in turn the payments for the additional capacity value of renewable baseload and renewable solar QFs must commence at that time. Because PacifiCorp's Compliance Filing fails to correctly calculate the transmission and renewable capacity cost inputs, it is inconsistent with Commission policy.

PacifiCorp should not compensate QFs for merely an incremental portion of the transmission expansion project. PacifiCorp has proposed an entirely new concept of reducing avoided costs (here a transmission line) with alleged avoided benefits. The practical impact of PacifiCorp's proposal is to have an avoided cost rate decrease. It makes no sense that PacifiCorp can move forward with its largest generation and

---

1 The Commission's policy for calculating avoided cost prices is bifurcated between renewable and non-renewable pricing. Each set of pricing is again bifurcated into resource sufficiency and deficiency periods, based upon the utility's next planned major resource acquisition. Because PacifiCorp is planning to acquire a renewable resource in 2020, its sufficiency period runs through 2020 and its deficiency period begins in 2021. The Commission's policy is to base avoided cost prices on market prices during the sufficiency period (where there is no avoidable acquisition) and to base avoided cost prices on the next planned resource (as the proxy resource) during the deficiency period. Re Investigation Into Determination of Resource Sufficiency, Docket No. UM 1396, Order No. 11-505 at 1 (Dec. 13, 2011).

transmission investment in its history, and the practical result would be an avoided cost rate decrease.

Finally, the Commission should resolve all issues *now*, and not put off resolution by another 30 days, as Staff recommends. The Joint QF Parties have pointed out for over two years that PacifiCorp was planning on acquiring new renewable resources, and its rates have been artificially low since then. The Commission was expected to finally resolve the issue of PacifiCorp's avoided cost rates on May 22, 2018, then postponed the decision until July 3, 2018, and is now scheduled to address the issue on July 17, 2018. Staff asks for another month to review PacifiCorp's transmission costs, which is likely to drag out even longer.

PacifiCorp is building more expensive resources, but Oregon QFs have been unable to sell power to the company. PacifiCorp has been in a resource acquisition mode since at least April 2016, when PacifiCorp issued its Renewable Request for Proposal to meet its promises to acquire 600 MW of power in the near term to comply with Senate Bill 1547. The Joint QF Parties have been arguing for over two years that PacifiCorp's renewable rates should reflect the reality that PacifiCorp is acquiring new renewables. PacifiCorp is moving forward with its Wyoming wind acquisitions and required transmission. Once PacifiCorp closes the deals on its new resources, which it will largely own, we expect PacifiCorp to promptly file an avoided cost rate change further lowering rates after it completes those acquisitions.

Meanwhile, Oregon QFs are unable to sell power to PacifiCorp, including some existing projects. As the comments filed in this proceeding show, at least one operating hydro facility has shut down because of PacifiCorp's rates,[2] and two have decided not to build (one of which is in large part due to PacifiCorp requiring the tiny project to pay for excessive transmission costs).[3] There are likely countless other projects that simply have been able to make the economics work. This is illustrated by the fact that since September 2016, PacifiCorp has only entered into *four* QF power purchase agreements: three renewals (one of which has shut down) and one new 200 kilowatt contract with an existing QF adding additional capacity.[4] At the same time, numerous QFs in PacifiCorp's service territory have been willing to pay one or two transmission wheels to sell their power to Portland General Electric.

The Commission has allowed PacifiCorp to kill PURPA in Oregon. Now is the time to reset the balance. Any further delay only benefits PacifiCorp.

II. COMMENTS

A. The New Transmission Line Would Not Be Built But For the New Wyoming Wind Resource Acquisition and Should Therefore Be Included in PacifiCorp's Renewable Avoided Cost Update

The Wyoming wind and transmission resources are inextricably linked in PacifiCorp's IRP, which means that both the wind and transmission costs must also be included in the avoided cost calculation. First, there is no doubt that the Wyoming wind

---

2 Roush Hydro's Comments at 2 (July 9, 2018) ("I haven't operated for the last nine months because it just isn't prudent to do so at the 'squeeze me out of business' rates that PacifiCorp is offering.").

3 Natel Energy's Comments at 1 (June 1, 2018) ("we received interconnection study results from PacifiCorp for the largest project in the portfolio, which was only 900 kW, ... the System Impact Study stated it would require an estimated cost of $27,837,999 for the complete interconnection package"); Houtama Hydropower's Comments at 2 (July 9, 2019) ("PacifiCorp's 2016 feasibility study of the project also was its obituary").

4 See Re PacifiCorp Informational Filing of QF Contracts or Summaries per OAR 860-029-0020(1), Docket No. RE 142.

resource could not be interconnected without the new transmission line and would not be built, but for the new transmission line. Second, there is no doubt that the new transmission line would not be built now, or may never have been built, but for the new Wyoming wind resource. At a more basic level, because the all-in costs for the Wyoming wind resources along with the new transmission expansion were deemed prudent and cost effective by the Commission in PacifiCorp's IRP acknowledgement order, those costs on a $/kw basis should set the avoided cost for Oregon QFs.

While the Commission's avoided cost policy includes a presumption that an on-system proxy resource[5] does not include avoided transmission costs, that presumption is rebuttable.[6] Given the details described below, the Joint QF Parties again ask the question: on what set of facts would one be able to rebut the Commission's presumption, if not these? Should the Commission decide this set of facts does not meet the test, it would effectively deem its presumption un-rebuttable, meaning that this kind of inextricably linked transmission costs would never be included in a utility's avoided cost rates.

---

[5] An on-system resource is a generation facility that is directly interconnected with the utility's system, e.g., the Wyoming wind is directly interconnected with PacifiCorp. An off-system resource is a generation facility that is not directly interconnected with the utility's system, e.g., most of Portland General Electric's "PGE's") generation is interconnected with other utilities. PacifiCorp's service territories are spread out across the Pacific Northwest and Rocky Mountain West, which often requires PacifiCorp to choose between either building new transmission or purchasing transmission from third parties to wheel power from its own interconnected generation resources to its own very distant load.

[6] Re Investigation Into Qualifying Facility Contracting and Pricing, Docket No. UM 1610, Order No. 16-174 at 8 (May 13, 2016) (addressing the question of whether an on-system resource could include avoided transmission for purposes of avoided cost calculations). The Commission's policy is also that off-system generation is presumed to need transmission to wheel the power to load. Thus, because PGE's avoided resource is off-system, PGE's avoided cost rates include transmission costs.

PacifiCorp's position that the Wyoming wind plant did not cause the transmission line expansion is not persuasive. PacifiCorp's most recent IRP expressly links the two projects. According to PacifiCorp, adding "the 1,100 MW of new Wyoming wind resources by the end of 2020 … requires that the new wind and transmission assets achieve commercial operation by the end of 2020 to fully achieve the benefits of federal wind production tax credits (PTCs)."[7] As pointed out in the Commission staff ("Staff") Report filed on May 15, 2018, both PacifiCorp's statements and the Commission's acknowledgement order confirm that the Aelous-to-Bridger/Anticline transmission expansion would not happen without the Wyoming wind plant.[8] The Commission's acknowledgment order explains that the wind resources will be acquired "in conjunction" with the transmission expansion and expressly conditions the acknowledgment of PacifiCorp's Energy Vision 2020 projects "to respond to the unusual timing circumstances caused by expiration of federal Production Tax Credits."[9]

More significantly, the Commission's IRP acknowledgement order deems the costs associated with the new Wyoming wind resources—along with the new transmission expansion—reasonable and prudent. The order notes, "PacifiCorp asserts that the proposed new wind resources net of PTC benefits, when combined with the transmission resource, are expected to provide economic benefits for PacifiCorp's customers, if both resources are operational by the end of 2020."[10] The Commission

---

7 Re PacifiCorp 2017 Integrated Resource Plan, Docket No. LC 67, PacifiCorp's 2017 IRP at 2, 17 (Apr. 4. 2017).

8 Staff Report at 5-6 (May 15, 2018) ("It is clear in PacifiCorp's acknowledged 2017 IRP that their renewable proxy resource must have incremental transmission costs.").

9 Docket No. LC 67, Order No. 18-138 at 1, 7 (Apr. 27, 2018).

10 Id.

expressly recognized that the value of the expiring tax incentives made the resource-transmission combination cost effective. The Joint QF Parties fail to understand why those same costs would not set PacifiCorp's avoided cost rates and be prudent costs to pay Oregon QFs.

Contrary to Staff's position, it is not sufficient to compensate QFs for an incremental portion of the transmission expansion project, because that does not reflect reality. First, PacifiCorp has never had a concrete plan to build the Aelous-to-Bridger/Anticline transmission line until now. PacifiCorp's most recent IRP identifies the Aelous-to-Bridger/Anticline transmission expansion as "a portion of the Windstar to Populus transmission project (Segment D), which is part of Energy Gateway West" and notes that the company "has pursued *permitting* of the Energy Gateway West transmission project since 2008."[11] PacifiCorp goes on to detail the long history of the Energy Gateway West Expansion Plan, noting "[s]ince its announcement in May 2007, Energy Gateway's scope and scale have continued to evolve …."[12]

Moreover, there is no reason to assume the Aelous-to-Bridger/Anticline transmission line would have been build in any specific year. Although PacifiCorp's transmission expansion was announced in 2007, PacifiCorp has never requested acknowledgement of any specific transmission expansion. PacifiCorp *might* have requested acknowledgment, but that does not mean the Aelous-to-Bridger/Anticline transmission line would have been built in 2024, 2025 or at all—absent the current Wyoming wind opportunity. The Commission has never said it was reasonable to build

---

11 Docket No. LC 67, PacifiCorp's 2017 IRP at 62 (emphasis added).
12 Id. at 68-72 ("Energy Gateway's Continued Evolution").

any new transmission projects associated with Energy Gateway, including the Aelous-to-Bridger/Anticline transmission line, until now.

PacifiCorp would have the Commission believe that because similar transmission expansion ideas have generally been contemplated by PacifiCorp since 2007, this specific transmission line *could* have eventually been constructed—even without the new Wyoming wind resource acquisition. According to PacifiCorp, therefore, the Aelous-to-Bridger/Anticline transmission line is not avoidable. That is not how avoided costs for a proxy resource work. Certain portions of PacifiCorp's previously acknowledged IRPs have not been built, because they were avoided. For example, PacifiCorp's past IRPs contemplated new gas acquisitions earlier than the current IRP. Those resources were not built or were been pushed out ten or more years. This illustrates how items in a utilities' long-term plan or IRP can be avoided with the purchase of other resources, like QFs.

Importantly, the fact that PacifiCorp's Energy Gateway West Expansion Plan has been envisioned for so long means that the current fact pattern was actually addressed when the Commission set its avoided cost policy. In fact, it is actually the reason the Commission's presumption that on-system proxy resources do not include avoid transmission costs is rebuttable.[13] The Commission was aware that PacifiCorp was planning, and could potentially build new transmission lines, which is why the Commission decided to allow parties to show that a new transmission project should be included in avoided cost rates. As Staff has concluded, "the circumstances of the D2

---

13 Docket No. UM 1610, Order No. 16-174 at 8 (addressing the question of whether an on-system resource could include avoided transmission for purposes of avoided cost calculations).

segment of the Gateway West and PacifiCorp's Wyoming wind resources are a concrete example that rebuts the presumption of Order No. 16-174."[14]

At bottom, the Commission's policy does not prevent resources from being included in avoided cost rates because they have been included in a long-term plan. Contrary to PacifiCorp's position, putting something in a long-term plan does not mean that it is not avoidable. Inclusion the acquisition an item in a utility's long-term plan simply demonstrates that the company is planning to eventually acquire that item, which should actually make it avoidable. Taking PacifiCorp's argument to its logical end would mean that almost none of PacifiCorp's acquisitions would be avoidable, including the proxy wind plant itself, because the majority of the company's acquisitions are part of its long-term planning. The Commission's policy looks to *any* action in an acknowledged IRP that is relevant to the calculation of the current avoided costs.[15] And the Commission has already determined that avoidable transmission expansion is relevant to the calculation of avoided costs.

B. PacifiCorp Unilaterally Decided to Discount the Transmission Costs Associated with the Aelous-to-Bridger/Anticline Transmission Line

Unfortunately, in addition to determining *whether* PacifiCorp's transmission cost should be included, the Commission must also address *how* those costs should be included. Importantly, PacifiCorp initially declined to provide transmission cost data for the Aelous-to-Bridger/Anticline transmission line, noting that this proceeding is not a contested case. After the issue was raised at the May 22, 2018 Public Meeting, PacifiCorp agreed to provide the relevant cost data. PacifiCorp's work papers indicate

---

14 Staff Report at 7 (July 11, 2018).

15 Docket No. 1610, Order No. 14-058 at 25-26 (setting out the four factors for the requisite annual update).

that the company has deeply discounted the transmission costs, due to other unspecified "benefits" of the transmission line. These "benefits" swallow up the majority of the costs, which means that under PacifiCorp's approach the avoided costs prices with the transmission costs (and benefits) are very similar to the avoided costs without the transmission costs. Thus, there still would be a renewable avoided cost rate *decrease* associated with the wind and transmission acquisition.

The Commission should not allow PacifiCorp to discount its avoided costs by imbedding generalized benefits in its cost calculations. An avoided benefit amounts to a rate decrement, which essentially discounts the avoided cost rate. The Joint QF Parties are not aware of any other examples where this Commission has effectively penalized QFs or otherwise lowered the avoided costs with some sort of an avoided benefit. The transmission line is part of the overall costs of the Commission-approved wind proxy from the IRP, and under a proxy method of setting avoided costs those *costs* are used to set the avoided costs. Benefits of the proxy resource *never* come into play in a proxy method. PacifiCorp has no basis for claiming unknown, unspecified benefits and should not be permitted to do so here.

If PacifiCorp's imbedded benefits are not rejected outright, then they must at least be vetted. As PacifiCorp itself has argued, this is not a contested case. Yet PacifiCorp's Motion and Compliance Filing raise new substantive concerns that warrant additional consideration. If PacifiCorp wants to make changes to the avoided cost calculations, it should put forward its arguments in another proceeding that allows discovery. Thus, the Commission should direct PacifiCorp to include the transmission costs without discounting to accommodate what PacifiCorp considers transmission benefits.

Importantly, this should occur after the Commission adopts new renewable avoided cost rates with the full costs of Wyoming wind and transmission. PacifiCorp's proposal to lower avoided costs with some ill-defined benefits is a novel concept that has never been addressed by the Commission. PacifiCorp should not be allowed to delay the adoption of new renewable rates any further.

C. PacifiCorp Wrongly Ignores the Renewable Capacity Costs Until 2030 When those Renewable Capacity Costs Should Be Included in 2021

PacifiCorp has also incorrectly calculated the capacity cost inputs in its Compliance Filing. PacifiCorp generally uses the correct 2021 renewable sufficiency period to calculate the renewable prices, but incorrectly relies upon the 2030 non-renewable sufficiency period when calculating capacity cost inputs.[16] This means that PacifiCorp is not paying solar and renewable baseload QFs for the additional capacity value they supply as compared to the renewable wind proxy until PacifiCorp is deficient for non-renewable capacity. The Joint QF Parties agree with Staff's analysis on this point in its memorandum dated July 11, 2018.

As Staff correctly notes, PacifiCorp's capacity calculations are inconsistent with Commission policy. The Commission allows utilities to decrement non-renewable wind and solar rates due to a lower capacity value compared to its gas proxy, but correspondingly requires utilities to pay higher rates to baseload and solar QFs when a wind plant is the proxy. The Commission has been explicit on this point. In Order No. 14-058, the Commission explains, "[f]or the Standard Renewable Method, Staff proposes adjusting the capacity component implicit in the renewable on-peak price by the incremental capacity contribution of the specific QF resource type ***relative to the avoided***

[16] PacifiCorp's Supplemental Filing at 2 (July 10, 2018).

renewable resource."[17] The end result is that during the renewable deficiency period where the avoided resource is a wind plant, the renewable baseload and renewable solar rates are higher than the renewable wind rates because renewable baseload and renewable solar QFs provide more capacity value than the avoided wind resource.

PacifiCorp did not initially explain why the company generally correctly uses 2021 as the renewable deficiency date, which is tied to the Wyoming wind resource acquisition, but then uses the 2030 date when calculating the capacity contribution of different renewable QF types. PacifiCorp's supplemental filing, submitted on July 10, 2018, would leave one with the impression that the Company has consistently calculated the capacity payments this way, but that is not accurate.[18] In most cases, the renewable and non-renewable deficiency dates have been the same, but a cursory review of PacifiCorp's filings indicate at least one filing where PacifiCorp had a renewable deficiency date before the non-renewable deficiency date. In that instance, PacifiCorp in fact increased the renewable baseload and renewable solar rates compared to the renewable wind in the year of the *renewable* deficiency.[19] Attachment A includes PacifiCorp's proposed rate tables, along with relevant portions of Appendix 1 (detailing capacity adder) and Appendix 2 (explaining the same). While those rates were not approved, the filing still contradicts PacifiCorp's claim.

By way of comparison, PGE has correctly calculated its capacity payments in the manner proposed by the Joint QF Parties and Staff since Order 14-058. In 2014, PGE's renewable deficiency year of 2020 has higher renewable baseload and solar rates as

---

17 Docket No. 1610, Order No. 14-058 at 15 (emphasis added).

18 PacifiCorp's Supplemental Filing at 1-2.

19 See Attachment A at Exhibits 1-8 (Excerpts from PacifiCorp's June 21, 2016 Schedule 37 Update).

compared to wind, even though non-renewable deficiency cut-off year was not until 2021.[20] In 2015, 2016 and 2017 PGE relied upon the same deficiency years and had the same treatment as it did in 2014.[21]

Importantly, PacifiCorp has unilaterally elected to change how its avoided cost rates are calculated without informing the Commission, Staff or parties. As such, this issue was not briefed by Staff and stakeholders in their initial comments and the Commission could not address the issue at the May 22, 2018 Public Meeting. PacifiCorp has a track record of previously making secretive policy changes that parties have been unable uncover in time to fully discuss.[22] The Joint QF Parties therefore reiterate a now oft-made request that the Commission check PacifiCorp's penchant for unilateral changes to its avoided cost updates.

Just as with the imbedded transmission benefits discussed above, if PacifiCorp wants to make changes to its capacity calculations, it should put forward its arguments in another proceeding that allows discovery.[23] Now is not the time to revise Commission

---

[20] Docket No. UM 1610, PGE's Compliance Filing (Nov. 25, 2014).

[21] Docket No. UM 1728, PGE's Schedule 201 Update (Aug. 13, 2015) (approved by Order No. 15-251); Docket No. UM 1728, PGE's Schedule 201 Update (Apr. 29, 2016) (approved by Order No. 16-220); Docket No. UM 1728, PGE's Schedule 201 Update (May 1, 2017) (approved by Order No. 17-177).

[22] E.g., Docket No. UM 1610, Order No. 16-429 at Appendix A at 3 (Nov. 2, 2016) (noting "PacifiCorp did not request that the Commission change its longstanding policy … [h]ence, neither Staff nor parties addressed the issue in Phase II testimony or briefs"); Re Investigation to Examine PacifiCorp's Non-Standard Avoided Cost Pricing, Docket No. UM 1802, Order No. 18-131 (April 19, 2018) (upholding OPUC policy).

[23] Docket No. UM 1610 Order No. 16-174 at 19 (May 14, 2016) (fining that existing QFs provide capacity value and should be compensated for it). It has been over two years the capacity inputs have not been adjusted to compensate QFs.

policy so that less than full avoided costs are paid to customers.[24] Regardless of PacifiCorp's motivations, the Compliance Filing is inconsistent with Commission policy. The Commission's policy requires PacifiCorp to add a capacity payment during the deficiency period.[25] Because PacifiCorp's deficiency period begins in 2021, PacifiCorp's avoided cost should include that capacity payment beginning in 2021. The Commission should direct PacifiCorp to correct the capacity inputs in the Compliance Filing.

D. PacifiCorp's Emergency Motion Is Moot Because the Renewable Rates Will Be Higher Than the Non-Renewable Rates When Calculated Correctly

The Joint QF Parties still maintain that if PacifiCorp's avoided costs were correctly calculated, PacifiCorp's renewable prices would actually be higher than the non-renewable prices, which would make PacifiCorp's Motion moot.[26] The Commission should direct PacifiCorp to refile its Compliance Filing with the full transmission costs attributed to the Aelous-to-Bridger/Anticline transmission line and with renewable capacity payments beginning in 2021. At that time, if PacifiCorp's renewable avoided cost prices are still lower than the non-renewable avoided cost prices—and only if they are still lower—should the Commission address PacifiCorp's Motion on the merits.

---

24 Id. at 23-26; see also Re Investigation into PacifiCorp's Schedule 37 - Avoided Cost Purchases from Qualifying Facilities of 10,000 kW or Less, Docket No. UM 1794, CREA and the Coalition's Response to PacifiCorp's Reply to Motion for Clarification of Scope of Proceeding at 4-11 (Dec. 5, 2016) (explaining the Commission's policy does not permit challenges to the avoided cost methodology during a utility's post-IRP updates). In UM 1794, PacifiCorp essentially argued that the *only* place to challenge inputs and assumptions used to calculate avoided cost prices was during the IRP process, which is not a contested case proceeding.

25 Docket No. UM 1610, Order No. 16-174 at 2. During the sufficiency period, the Commission has determined that market-based prices adequately compensate QFs for the power produced without adding a capacity payment.

26 See Public Meeting beginning at 1:08:22 (May 22, 2018) (explaining that immediate relief is not warranted because harm has not been established); CREA and the Coalition Comments at 17-21 (May 11, 2018) (same).

III. CONCLUSION

For the reasons stated above, the Joint QF Parties request that the Commission reject PacifiCorp's Compliance Filing and direct PacifiCorp to include the missing transmission and capacity cost inputs in its renewable avoided cost prices.

Dated this 13th day of July 2018.

Respectfully submitted,

____

Irion Sanger
Sidney Villanueva
Sanger Law, PC
1117 SE 53rd Avenue
Portland, OR 97215
Telephone: 503-756-7533
irion@sanger-law.com

Of Attorneys for the Renewable Energy Coalition

RICHARDSON ADAMS, PLLC

____

Gregory M. Adams
OSB No. 101779
515 N. 27th Street
Boise, Idaho 83702
(208) 938-2236
greg@richardsonadams.com

Of Attorneys for the Community Renewable Energy Association

Attachment A

Excerpts from PacifiCorp's June 21, 2016 Schedule 37 Update (Proposed Rate Tables, Appendix 1 Exhibits 1-8, and Appendix 2)

Avoided Cost Prices

Standard Fixed Avoided Cost Prices for Base Load and Wind QF (C)

Deliveries During Calendar Year	Base Load QF (1,3) On-Peak Energy Price	Base Load QF (1,3) Off-Peak Energy Price	Wind QF (2,3) On-Peak Energy Price	Wind QF (2,3) Off-Peak Energy Price
	(a)	(b)	(c)	(d)
2016	2.34	1.99	2.03	1.67
2017	2.63	2.17	2.31	1.85
2018	2.82	2.30	2.50	1.97
2019	2.94	2.38	2.61	2.05
2020	3.10	2.51	2.76	2.17
2021	3.30	2.71	2.95	2.36
2022	3.60	3.00	3.24	2.64
2023	4.03	3.37	3.66	3.00
2024	4.44	3.73	4.07	3.36
2025	4.66	3.93	4.28	3.55
2026	4.84	4.09	4.45	3.70
2027	5.06	4.27	4.66	3.87
2028	6.23	3.25	3.59	2.84
2029	6.39	3.34	3.69	2.92
2030	6.66	3.55	3.91	3.12
2031	6.82	3.64	4.01	3.20
2032	6.99	3.74	4.12	3.29
2033	7.19	3.86	4.25	3.40
2034	7.38	3.98	4.37	3.51
2035	7.56	4.09	4.49	3.61

(C)

(continued)

Avoided Cost Prices (Continued)

Standard Fixed Avoided Cost Prices for Fixed and Tracking Solar QF (N)

Deliveries During Calendar Year	Fixed Solar QF (3)		Tracking Solar QF (3)	
	On-Peak Energy Price	Off-Peak Energy Price	On-Peak Energy Price	Off-Peak Energy Price
	(e)	(f)	(g)	(h)
2016	2.34	1.99	2.34	1.99
2017	2.63	2.17	2.63	2.17
2018	2.82	2.30	2.82	2.30
2019	2.94	2.38	2.94	2.38
2020	3.10	2.51	3.10	2.51
2021	3.30	2.71	3.30	2.71
2022	3.60	3.00	3.60	3.00
2023	4.03	3.37	4.03	3.37
2024	4.44	3.73	4.44	3.73
2025	4.66	3.93	4.66	3.93
2026	4.84	4.09	4.84	4.09
2027	5.06	4.27	5.06	4.27
2028	4.21	3.25	4.34	3.25
2029	4.32	3.34	4.46	3.34
2030	4.55	3.55	4.69	3.55
2031	4.66	3.64	4.81	3.64
2032	4.78	3.74	4.93	3.74
2033	4.93	3.86	5.08	3.86
2034	5.07	3.98	5.22	3.98
2035	5.21	4.09	5.36	4.09

(N)

(1) Capacity Contribution to Peak for Avoided Proxy Resource and Base Load Qualifying Facility resource are assumed 100%. (M) (M)

(2) The standard avoided cost price for wind is reduced by an integration charge of $3.06/MWh ($2014). If Wind Qualifying Facility is not in PacifiCorp's balancing authority area, then no reduction is required. (C)(M) (M)

(3) Standard Resource Sufficiency Period ends December 31, 2027 and Standard Resource Deficiency Period begins January 1, 2028. (N) (N)

(continued)

Avoided Cost Prices (Continued)

Renewable Fixed Avoided Cost Prices for Base Load and Wind QF (M)(C)

Deliveries During Calendar Year	Renewable Base Load QF (1,4)		Wind QF (1,2,3)	
	On-Peak Energy Price	Off-Peak Energy Price	On-Peak Energy Price	Off-Peak Energy Price
	(a)	(b)	(c)	(d)
2016	2.34	1.99	2.03	1.67
2017	2.63	2.17	2.31	1.85
2018	6.04	3.40	3.94	3.08
2019	6.18	3.48	4.03	3.15
2020	6.29	3.62	4.08	3.28
2021	6.41	3.75	4.15	3.40
2022	6.58	3.81	4.27	3.45
2023	6.74	3.88	4.38	3.51
2024	6.88	3.98	4.47	3.61
2025	7.03	4.08	4.56	3.70
2026	7.17	4.18	4.65	3.79
2027	7.33	4.28	4.75	3.88
2028	7.49	4.37	4.86	3.96
2029	7.65	4.46	4.95	4.05
2030	7.82	4.55	5.07	4.12
2031	7.99	4.65	5.18	4.22
2032	8.16	4.77	5.29	4.32
2033	8.33	4.88	5.39	4.43
2034	8.51	5.00	5.51	4.53
2035	8.67	5.13	5.61	4.66

(M)(C)

(continued)

Avoided Cost Prices (Continued)

Renewable Fixed Avoided Cost Prices for Fixed and Tracking Solar QF (N)

Deliveries During Calendar Year	Fixed Solar QF (1,4) On-Peak Energy Price (e)	Fixed Solar QF (1,4) Off-Peak Energy Price (f)	Tracking Solar QF (1,4) On-Peak Energy Price (g)	Tracking Solar QF (1,4) Off-Peak Energy Price (h)
2016	2.34	1.99	2.34	1.99
2017	2.63	2.17	2.63	2.17
2018	4.42	3.40	4.53	3.40
2019	4.53	3.48	4.64	3.48
2020	4.59	3.62	4.71	3.62
2021	4.67	3.75	4.79	3.75
2022	4.80	3.81	4.92	3.81
2023	4.93	3.88	5.05	3.88
2024	5.03	3.98	5.15	3.98
2025	5.13	4.08	5.26	4.08
2026	5.24	4.18	5.37	4.18
2027	5.34	4.28	5.48	4.28
2028	5.47	4.37	5.60	4.37
2029	5.58	4.46	5.72	4.46
2030	5.71	4.55	5.85	4.55
2031	5.83	4.65	5.97	4.65
2032	5.95	4.77	6.10	4.77
2033	6.08	4.88	6.22	4.88
2034	6.21	5.00	6.36	5.00
2035	6.32	5.13	6.48	5.13

(N)

(1) For the purpose of determining: (i) when the Renewable Qualifying Facility is entitled to renewable avoided cost prices; and (ii) the ownership of Environmental Attributes and the transfer of Green Tags to PacifiCorp, the Renewable Resource Sufficiency Period ends December 31, 2017, and the Renewable Resource Deficiency Period begins January 1, 2018. (C) (C) (D)

(2) During the Renewable Resource Deficiency Period, the renewable avoided cost price for a Wind Qualifying Facility will be adjusted by adding the difference between the avoided integration costs and the Qualifying Facility's integration costs. If the Wind Qualifying Facility is in PacifiCorp's Balancing Authority Area (BAA), the adjustment is zero (integration costs cancel each other out). If the Wind Qualifying Facility is not in PacifiCorp's BAA, the renewable avoided cost price will be increased by avoided integration charge of $3.06/MWh ($2014). (C) (C) (C)

(3) During Renewable Resource Sufficiency Period, the renewable avoided cost price for a Wind Qualifying Facility is reduced by an integration charge of $3.06/MWh ($2014) for Wind Qualifying Facilities located in PacifiCorp's BAA (in-system). If a Wind Qualifying Facility is not in PacifiCorp's BAA, the renewable avoided cost price will be increased by avoided integration charge of $3.06/MWh ($2014). (C) (C)

(4) During the Renewable Resource Deficiency Period, the renewable avoided cost price for Base Load, Fixed Solar and Tracking Solar is increased by an integration charge of $3.06/MWh ($2014). (N) (N)

(continued)

PACIFIC POWER
AVOIDED COST CALCULATION

STANDARD RATES FOR AVOIDED COST PURCHASES FROM ELIGIBLE QUALIFYING FACILITIES

OREGON – June 2016

Exhibit 1
Standard Avoided Cost Prices for Base Load QF (1)
$/MWH

	Standard Avoided Resource			Base Load QF Resource	
Year	Capacity Price	Capacity Cost Allocated to On-Peak Hours	Energy Only Price	On-Peak	Off-Peak
	$/kW-yr	($/MWh)	$/MWh	$/MWh	$/MWh
	(a)	(b)	(c)	(d)	(e)
		(a) /(8.76 x 100.0% x 57%)		(b) + (c)	= (c)
2016	Market Based Prices 2016 through 2027			$23.43	$19.86
2017				$26.30	$21.68
2018				$28.22	$22.97
2019				$29.44	$23.80
2020				$30.99	$25.14
2021				$33.03	$27.14
2022				$35.96	$30.03
2023				$40.26	$33.69
2024				$44.43	$37.30
2025				$46.61	$39.32
2026				$48.41	$40.90
2027				$50.57	$42.74
2028	$149.06	$29.85	$32.45	$62.30	$32.45
2029	$152.18	$30.48	$33.37	$63.85	$33.37
2030	$155.56	$31.15	$35.46	$66.61	$35.46
2031	$158.99	$31.84	$36.37	$68.21	$36.37
2032	$162.49	$32.54	$37.35	$69.89	$37.35
2033	$166.05	$33.26	$38.59	$71.85	$38.59
2034	$169.68	$33.98	$39.77	$73.75	$39.77
2035	$173.39	$34.73	$40.88	$75.61	$40.88

(1) Capacity Contribution of the Avoided Proxy and Base Load QF resources are assumed to be 100%.

Columns
- (a) Full fixed cost of a proxy CCCT less capitalized energy
- (b) 100.0% is the on-peak capacity factor of the Proxy Resource
  57.0% is the percent of all hours that are on-peak
- (c) Fuel and Capitalized Energy Cost of the Proxy CCCT
- (d) 2016-2027 On-Peak Blended Market Prices for QF resource
- (e) 2016-2027 Off-Peak Blended Market Prices for QF resource

Exhibit 2

Standard Avoided Cost Prices for Wind QF (1,2)

$/MWH

	Standard Avoided Resource			Wind QF Resource			
Year	Capacity Price	Capacity Cost Allocated to On-Peak Hours	Energy Only Price	Capacity Contribution	Capacity Payment On-Peak Hours	On-Peak	Off-Peak
	$/kW-yr	($/MWh)	$/MWh		$/MWh	$/MWh	$/MWh
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
		(a) /(8.76 x 100.0% x 57%)			= (b) * (d)	= (c) + (e)	= (c)
2016						$20.31	$16.74
2017						$23.11	$18.49
2018		Market Based Prices				$24.95	$19.70
2019		2016 through 2027				$26.09	$20.45
2020		less Wind Integration (2)				$27.56	$21.71
2021						$29.52	$23.63
2022						$32.37	$26.44
2023						$36.59	$30.02
2024						$40.68	$33.55
2025						$42.78	$35.49
2026						$44.50	$36.99
2027						$46.57	$38.74
2028	$149.06	$29.85	$32.45	25.40%	$7.58	$35.94	$28.36
2029	$152.18	$30.48	$33.37	25.40%	$7.74	$36.93	$29.19
2030	$155.56	$31.15	$35.46	25.40%	$7.91	$39.10	$31.19
2031	$158.99	$31.84	$36.37	25.40%	$8.09	$40.10	$32.01
2032	$162.49	$32.54	$37.35	25.40%	$8.27	$41.16	$32.89
2033	$166.05	$33.26	$38.59	25.40%	$8.45	$42.48	$34.03
2034	$169.68	$33.98	$39.77	25.40%	$8.63	$43.74	$35.11
2035	$173.39	$34.73	$40.88	25.40%	$8.82	$44.94	$36.12

(1) The standard avoided cost price is reduced by a wind integration charge of $3.06/MWh ($2014) for wind QF resources located in PacifiCorp's Balancing Area Authority (BAA) (in-system) .
If QF wind resource is not in PacifiCorp's BAA, prices will be increased by the $3.06/MWh ($2014) integration charges

(2) Wind Integration Charge is $3.06 (2014 $ per MWh) - 2015 IRP Volume II-Appendix H, Table H.3
Table 11 - Wind Integration Cost

Columns
- (a) Full fixed cost of a proxy CCCT less capitalized energy
- (b) 100.0% is the on-peak capacity factor of the Proxy Resource
  57.0% is the percent of all hours that are on-peak
- (c) Fuel and Capitalized Energy Cost of the Proxy CCCT
- (d) Peak Capacity Contribution values for renewables (% of nameplate capacity), 2015 IRP
  (2015 IRP Volume II-Appendix N, Table N.1, page 405)
- (f) 2016-2027 On-Peak Blended Market Prices for QF resource
- (g) 2016-2027 Off-Peak Blended Market Prices for QF resource

Wind Capacity Contribution 25.4%

Exhibit 3
Standard Avoided Cost Prices for Fixed Solar QF
$/MWH

	Standard Avoided Resource			Fixed Solar QF			
Year	Capacity Price	Capacity Cost Allocated to On-Peak Hours	Energy Only Price	Capacity Contribution	Capacity Payment On-Peak Hours	On-Peak	Off-Peak
	$/kW-yr	($/MWh)	$/MWh		$/MWh	$/MWh	$/MWh
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
		(a) /(8.76 x 100.0% x 57%)			= (b) * (d)	= (c) + (e)	= (c)
2016	Market Based Prices 2016 through 2027					$23.43	$19.86
2017						$26.30	$21.68
2018						$28.22	$22.97
2019						$29.44	$23.80
2020						$30.99	$25.14
2021						$33.03	$27.14
2022						$35.96	$30.03
2023						$40.26	$33.69
2024						$44.43	$37.30
2025						$46.61	$39.32
2026						$48.41	$40.90
2027						$50.57	$42.74
2028	$149.06	$29.85	$32.45	32.20%	$9.61	$42.06	$32.45
2029	$152.18	$30.48	$33.37	32.20%	$9.81	$43.18	$33.37
2030	$155.56	$31.15	$35.46	32.20%	$10.03	$45.49	$35.46
2031	$158.99	$31.84	$36.37	32.20%	$10.25	$46.62	$36.37
2032	$162.49	$32.54	$37.35	32.20%	$10.48	$47.83	$37.35
2033	$166.05	$33.26	$38.59	32.20%	$10.71	$49.30	$38.59
2034	$169.68	$33.98	$39.77	32.20%	$10.94	$50.71	$39.77
2035	$173.39	$34.73	$40.88	32.20%	$11.18	$52.06	$40.88

Columns
(a) Full fixed cost of a proxy CCCT less capitalized energy
(b) 100.0% is the on-peak capacity factor of the Proxy Resource
57.0% is the percent of all hours that are on-peak
(c) Fuel and Capitalized Energy Cost of the Proxy CCCT
(d) Peak Capacity Contribution values for renewables (% of nameplate capacity), 2015 IRP
(2015 IRP Volume II-Appendix N, Table N.1, page 405)
(f) 2016-2027 On-Peak Blended Market Prices for QF resource
(g) 2016-2027 Off-Peak Blended Market Prices for QF resource

Fixed Solar Capacity Contribution 32.2%

Exhibit 4
Standard Avoided Cost Prices for Tracking Solar QF
$/MWH

	Standard Avoided Resource			Tracking Solar QF			
Year	Capacity Price	Capacity Cost Allocated to On-Peak Hours	Energy Only Price	Capacity Contribution	Capacity Payment On-Peak Hours	On-Peak	Off-Peak
	$/kW-yr	($/MWh)	$/MWh		$/MWh	$/MWh	$/MWh
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
		(a) /(8.76 x 100.0% x 57%)			= (b) * (d)	= (c) + (e)	= (c)
2016	Market Based Prices 2016 through 2027					$23.43	$19.86
2017						$26.30	$21.68
2018						$28.22	$22.97
2019						$29.44	$23.80
2020						$30.99	$25.14
2021						$33.03	$27.14
2022						$35.96	$30.03
2023						$40.26	$33.69
2024						$44.43	$37.30
2025						$46.61	$39.32
2026						$48.41	$40.90
2027						$50.57	$42.74
2028	$149.06	$29.85	$32.45	36.70%	$10.95	$43.40	$32.45
2029	$152.18	$30.48	$33.37	36.70%	$11.19	$44.56	$33.37
2030	$155.56	$31.15	$35.46	36.70%	$11.43	$46.89	$35.46
2031	$158.99	$31.84	$36.37	36.70%	$11.69	$48.06	$36.37
2032	$162.49	$32.54	$37.35	36.70%	$11.94	$49.29	$37.35
2033	$166.05	$33.26	$38.59	36.70%	$12.21	$50.80	$38.59
2034	$169.68	$33.98	$39.77	36.70%	$12.47	$52.24	$39.77
2035	$173.39	$34.73	$40.88	36.70%	$12.75	$53.63	$40.88

Columns
- (a) Full fixed cost of a proxy CCCT less capitalized energy
- (b) 100.0% is the on-peak capacity factor of the Proxy Resource
  57.0% is the percent of all hours that are on-peak
- (c) Fuel and Capitalized Energy Cost of the Proxy CCCT
- (d) Peak Capacity Contribution values for renewables (% of nameplate capacity), 2015 IRP
  (2015 IRP Volume II-Appendix N, Table N.1, page 405)
- (f) 2016-2027 On-Peak Blended Market Prices for QF resource
- (g) 2016-2027 Off-Peak Blended Market Prices for QF resource

Tracking Solar Capacity Contribution 36.7%

Exhibit 5

Renewable Avoided Cost Prices for Base Load QF(1)
$/MWH

Year	Renewable Wind Avoided Resource On-Peak ($/MWh) (a)	Renewable Wind Avoided Resource Off-Peak ($/MWh) (b)	Renewable Base Load QF Resource Capital Cost Allocated to Capacity (On-Peak Hours) ($/MWh) (c)	Renewable Base Load QF Resource QF Capacity Adder ($/MWh) (d) = (c) * 74.6%	On-Peak $/MWh (e) = (a) + (d)	Off-Peak $/MWh (f) = (b)
2016					$23.43	$19.86
2017					$26.30	$21.68
2018	$39.36	$30.75	$23.81	$17.76	$60.39	$34.02
2019	$40.28	$31.46	$24.39	$18.19	$61.82	$34.81
2020	$40.82	$32.80	$24.97	$18.63	$62.88	$36.23
2021	$41.50	$33.97	$25.57	$19.08	$64.09	$37.48
2022	$42.65	$34.50	$26.16	$19.52	$65.76	$38.09
2023	$43.78	$35.14	$26.76	$19.96	$67.41	$38.81
2024	$44.67	$36.06	$27.38	$20.43	$68.85	$39.81
2025	$45.56	$36.99	$27.98	$20.87	$70.26	$40.82
2026	$46.51	$37.85	$28.59	$21.33	$71.75	$41.76
2027	$47.46	$38.80	$29.22	$21.80	$73.26	$42.80
2028	$48.57	$39.58	$29.85	$22.27	$74.93	$43.67
2029	$49.54	$40.45	$30.48	$22.74	$76.46	$44.63
2030	$50.73	$41.22	$31.15	$23.24	$78.24	$45.49
2031	$51.75	$42.16	$31.84	$23.75	$79.86	$46.52
2032	$52.85	$43.23	$32.54	$24.27	$81.58	$47.69
2033	$53.93	$44.26	$33.26	$24.81	$83.30	$48.82
2034	$55.08	$45.32	$33.98	$25.35	$85.09	$49.98
2035	$56.07	$46.58	$34.73	$25.91	$86.74	$51.34

Columns
- (e) 2016-2027 On-Peak Blended Market Prices for QF resource
- (f) 2016-2027 Off-Peak Blended Market Prices for QF resource

(1) The renewable avoided cost price during the deficiency period is increased by the avoided integration charge

Exhibit 6
Renewable Avoided Cost Prices for Wind QF (1) (2) (3)
$/MWH

Year	Renewable Wind Avoided Resource On-Peak	Renewable Wind Avoided Resource Off-Peak	Wind QF Resource Capital Cost Allocated to Capacity (On-Peak Hours)	Wind QF Resource QF Capacity Adder	Wind QF Resource On-Peak	Wind QF Resource Off-Peak
	($/MWh)	($/MWh)	($/MWh)	($/MWh)	$/MWh	$/MWh
	(a)	(b)	(c)	(d)	(e)	(f)
				= (c) * 0.0%	= (a) + (d)	= (b)
2016					$20.31	$16.74
2017					$23.11	$18.49
2018	$39.36	$30.75	$23.81	$0.00	$39.36	$30.75
2019	$40.28	$31.46	$24.39	$0.00	$40.28	$31.46
2020	$40.82	$32.80	$24.97	$0.00	$40.82	$32.80
2021	$41.50	$33.97	$25.57	$0.00	$41.50	$33.97
2022	$42.65	$34.50	$26.16	$0.00	$42.65	$34.50
2023	$43.78	$35.14	$26.76	$0.00	$43.78	$35.14
2024	$44.67	$36.06	$27.38	$0.00	$44.67	$36.06
2025	$45.56	$36.99	$27.98	$0.00	$45.56	$36.99
2026	$46.51	$37.85	$28.59	$0.00	$46.51	$37.85
2027	$47.46	$38.80	$29.22	$0.00	$47.46	$38.80
2028	$48.57	$39.58	$29.85	$0.00	$48.57	$39.58
2029	$49.54	$40.45	$30.48	$0.00	$49.54	$40.45
2030	$50.73	$41.22	$31.15	$0.00	$50.73	$41.22
2031	$51.75	$42.16	$31.84	$0.00	$51.75	$42.16
2032	$52.85	$43.23	$32.54	$0.00	$52.85	$43.23
2033	$53.93	$44.26	$33.26	$0.00	$53.93	$44.26
2034	$55.08	$45.32	$33.98	$0.00	$55.08	$45.32
2035	$56.07	$46.58	$34.73	$0.00	$56.07	$46.58

(1) During the deficiency period, avoided cost prices will be adjusted by adding the difference between the avoided integration costs and Qualifying Facility's integration costs. If the Wind QF resource is in PacifiCorp's Balancing Area Authority (BAA), the adjustment is zero (integration costs cancel each other out).
If Qualifying Facility Wind resource is not in PacifiCorp's BAA, $3.06/MWh ($2014) will be added for avoided integration charges.

(2) During the sufficiency period, avoided cost prices is reduced by an integration charge of $3.06/MWh ($2014) for a Qualifying Facility wind resource located in PacifiCorp's BAA (in-system).
If Qualifying Facility wind resource is not in PacifiCorp's BAA, the renewable avoided cost price will be increased by the $3.06/MWh ($2014) integration charges.

(3) Wind Integration Charge is $3.06 (2014 $ per MWh) - 2015 IRP Volume II-Appendix H, Table H.3
Table 11 - Wind Integration Cost

Columns
(e) On-Peak Blended Market Prices.
(f) Off-Peak Blended Market Prices.

Exhibit 7

Renewable Avoided Cost Prices for Fixed Solar QF (1)
$/MWH

Year	Renewable Wind Avoided Resource On-Peak ($/MWh) (a)	Renewable Wind Avoided Resource Off-Peak ($/MWh) (b)	Fixed Solar QF Resource Capital Cost Allocated to Capacity (On-Peak Hours) ($/MWh) (c)	Fixed Solar QF Resource QF Capacity Adder ($/MWh) (d) = (c) * 6.8%	Fixed Solar QF On-Peak $/MWh (e) = (a) + (d)	Fixed Solar QF Off-Peak $/MWh (f) = (b)
2016					$23.43	$19.86
2017					$26.30	$21.68
2018	$39.36	$30.75	$23.81	$1.62	$44.25	$34.02
2019	$40.28	$31.46	$24.39	$1.66	$45.29	$34.81
2020	$40.82	$32.80	$24.97	$1.70	$45.95	$36.23
2021	$41.50	$33.97	$25.57	$1.74	$46.75	$37.48
2022	$42.65	$34.50	$26.16	$1.78	$48.02	$38.09
2023	$43.78	$35.14	$26.76	$1.82	$49.27	$38.81
2024	$44.67	$36.06	$27.38	$1.86	$50.28	$39.81
2025	$45.56	$36.99	$27.98	$1.90	$51.29	$40.82
2026	$46.51	$37.85	$28.59	$1.94	$52.36	$41.76
2027	$47.46	$38.80	$29.22	$1.99	$53.45	$42.80
2028	$48.57	$39.58	$29.85	$2.03	$54.69	$43.67
2029	$49.54	$40.45	$30.48	$2.07	$55.79	$44.63
2030	$50.73	$41.22	$31.15	$2.12	$57.12	$45.49
2031	$51.75	$42.16	$31.84	$2.17	$58.28	$46.52
2032	$52.85	$43.23	$32.54	$2.21	$59.52	$47.69
2033	$53.93	$44.26	$33.26	$2.26	$60.75	$48.82
2034	$55.08	$45.32	$33.98	$2.31	$62.05	$49.98
2035	$56.07	$46.58	$34.73	$2.36	$63.19	$51.34

Columns
(e) On-Peak Blended Market Prices for QF resource
(f) Off-Peak Blended Market Prices for QF resource

(1) The renewable avoided cost price during the deficiency period is increased by the avoided integration charge

Exhibit 8

Renewable Avoided Cost Prices for Tracking Solar QF (1)
$/MWH

Year	Renewable Wind Avoided Resource On-Peak ($/MWh)	Renewable Wind Avoided Resource Off-Peak ($/MWh)	Tracking Solar QF Resource Capital Cost Allocated to Capacity (On-Peak Hours) ($/MWh)	Tracking Solar QF Resource QF Capacity Adder ($/MWh)	Tracking Solar QF On-Peak $/MWh	Tracking Solar QF Off-Peak $/MWh
	(a)	(b)	(c)	(d)	(e)	(f)
				= (c) * 11.3%		
2016					$23.43	$19.86
2017					$26.30	$21.68
2018	$39.36	$30.75	$23.81	$2.69	$45.32	$34.02
2019	$40.28	$31.46	$24.39	$2.76	$46.39	$34.81
2020	$40.82	$32.80	$24.97	$2.82	$47.07	$36.23
2021	$41.50	$33.97	$25.57	$2.89	$47.90	$37.48
2022	$42.65	$34.50	$26.16	$2.96	$49.20	$38.09
2023	$43.78	$35.14	$26.76	$3.02	$50.47	$38.81
2024	$44.67	$36.06	$27.38	$3.09	$51.51	$39.81
2025	$45.56	$36.99	$27.98	$3.16	$52.55	$40.82
2026	$46.51	$37.85	$28.59	$3.23	$53.65	$41.76
2027	$47.46	$38.80	$29.22	$3.30	$54.76	$42.80
2028	$48.57	$39.58	$29.85	$3.37	$56.03	$43.67
2029	$49.54	$40.45	$30.48	$3.44	$57.16	$44.63
2030	$50.73	$41.22	$31.15	$3.52	$58.52	$45.49
2031	$51.75	$42.16	$31.84	$3.60	$59.71	$46.52
2032	$52.85	$43.23	$32.54	$3.68	$60.99	$47.69
2033	$53.93	$44.26	$33.26	$3.76	$62.25	$48.82
2034	$55.08	$45.32	$33.98	$3.84	$63.58	$49.98
2035	$56.07	$46.58	$34.73	$3.92	$64.75	$51.34

Columns
(e) On-Peak Blended Market Prices for QF resource
(f) Off-Peak Blended Market Prices for QF resource

(1) The renewable avoided cost price during the deficiency period is increased by the avoided integration charge

PACIFIC POWER
AVOIDED COST CALCULATION

STANDARD RATES FOR AVOIDED COST PURCHASES FROM ELIGIBLE QUALIFYING FACILITIES

OREGON – JUNE 2016

PACIFIC POWER
AVOIDED COST CALCULATION

STANDARD RATES FOR AVOIDED COST PURCHASES FROM ELIGIBLE QUALIFYING FACILITIES

OREGON – June 2016

Standard avoided cost rates are paid to eligible small qualifying facilities (QFs). Oregon avoided cost filing requirements as listed in OAR 860-029-0040 and 860-029-0080 require the Company to file updated avoided costs at least every two years. The Commission Order No. 14-058, requires the Oregon investor owned utilities to update avoided cost prices annually on May 1 of each year and within 30-days of Integrated Resource Plan (IRP) acknowledgment. Annual updates, filed on May 1 of each year, are required to update the following data inputs: (1) natural gas prices; (2) on-peak and off-peak forward looking electricity market prices; (3) production tax credit status; and (4) any other action or change in an acknowledged IRP relevant to the calculation of avoided costs.

The last Oregon avoided costs were approved on June 23, 2015.

Sufficiency and Deficiency Periods

In Docket UM-1396 Order 10-488, the Commission directed that the start date of the first "major resource acquisition" in the action plan of the IRP determines the resource "sufficiency" and "deficiency" periods to be used in calculations of standard avoided cost prices. The sufficiency and deficiency periods used in this filing are based on the 2015 IRP which was acknowledged by the Commission on February 29, 2016.

Table 1 presents an excerpt from the 2015 IRP Table 8.7 and shows that the next major resource acquisition is a Combine Cycle Combustion Turbine (CCCT) starting in 2028. Therefore, the resource sufficiency period for the standard avoided cost rates is from 2016-2027 and the deficiency period starts in 2028.

For standard renewable avoided cost rates, the start of the renewable resource deficiency period and renewable proxy plant cost assumptions are revised due to the changed circumstances with the passing of Oregon Senate Bill 1547 legislation. The Company recently issued a renewable resource RFP in to identify potential time sensitive opportunities to acquire renewable resources or renewable energy credits that could be used to meet the Renewable Portfolio Standard requirements set forth in SB 1547. In this filing the renewable resource deficiency period is revised to start in 2018, assuming a new renewable resource that qualifies for 100% production tax credit (PTC) benefits is brought online by January 1, 2018.

Avoided Cost Calculation

Based on the 2015 IRP preferred portfolio shown in **Table 1**, the standard avoided cost calculation is separated into two distinct periods: (1) a period of standard resource sufficiency (2016 through 2027); and (2) a period of standard resource deficiency (2028 and beyond). During the resource sufficiency period (2016 through 2027), standard avoided energy costs are based on market prices. Market prices from the Company's Official Forward Price Curve are weighted by market transactions required to support the addition of an assumed 50 MW Oregon Qualified Facility. To calculate the weighting, two production cost studies are prepared. The only difference between the two studies is an assumed 50 aMW, zero running cost resource. System balancing sales and purchase volumes are extracted from both studies and the change between the two studies is calculated for each market hub. This volume impact is used to weight the Company's Official Market Price Forecast on-peak and off-peak market prices for COB, Mid-Columbia, and Palo Verde for each month. **Table 2** shows the result of this calculation.

The sufficiency period for standard renewable rates is 2016 through 2017 and the renewable resource deficiency period starts in 2018. During the renewable resource sufficiency period (2016 through 2017), the renewable avoided energy costs are based on weighted market prices.

During the resource deficiency period, standard avoided costs are the fixed and variable costs of a proxy resource that could be avoided or deferred. The current thermal proxy resource used to set standard avoided cost rates beginning in 2028 is a west side CCCT from the 2015 IRP.[1]

Since CCCTs are built as base load units that provide both capacity and energy, it is appropriate to split the fixed costs of this unit into capacity and energy components. The fixed cost of a simple cycle combustion turbine (SCCT), which is usually acquired as a capacity resource, defines the portion of the fixed cost of the CCCT that is assigned to capacity.[2] Fixed costs associated with the construction of a CCCT which are in excess of SCCT costs are assigned to energy and are added to the variable production (fuel) cost of the CCCT to determine the total avoided energy costs. **Table 3** shows the capitalized energy costs, which in this case are zero because the costs of an SCCT exceed those of the CCCT.

The fuel cost of the CCCT defines the avoided variable energy costs. The gas price forecast used as the basis for the CCCT fuel cost is discussed later in this document.

---

[1] 477 MW CCCT (Dry "J" Adv 1x1) - West Side Options (1500') –available in 2028 as listed in Tables 6.1 and 6.2 of the 2015 IRP. Fuel costs are from the Company's March 2016 Official Forward Price Curve (1603 OFPC).

[2] SCCT Frame ("F"x1) - West Side Options (1500'), as listed in Tables 6.1 and 6.2 of the 2015 IRP.

Table 4 shows the CCCT fuel cost, the addition of capitalized energy costs at an assumed 72.1% capacity factor, and the total avoided energy costs.

Because energy generated by a QF may vary, we have prepared total standard avoided costs at 75%, 85% and 90% capacity factor to illustrate the impact of differing generation levels. This calculation is shown in **Table 5**.

Standard avoided costs are differentiated between on-peak and off-peak periods, with capacity costs allocated to on-peak periods. On an annual basis, approximately 57% of all hours are on-peak and 43% are off-peak. **Table 6** shows the calculation of on-peak and off-peak avoided energy prices.

For informational purposes, **Tables 7 and 8** show a comparison between current avoided costs currently in effect in Oregon and the proposed avoided costs in this filing.

Table 9 shows the calculation of the total fixed costs and fuel costs of the CCCT and SCCT that are used in **Table 3** and **Table 4**. In this filing, the Company's thermal proxy resource is a CCCT located on the west side of the Company's system. Current Commission approved avoided costs are also based upon a CCCT located on the west side of the Company's system.

Gas Price Forecast

Gas prices used in this filing utilize the Company's March 2016 Official Forward Price Curve (1603 OFPC). **Table 10** shows the natural gas price used in this avoided cost calculation.

Table 11 shows wind integration costs used in 2015 IRP.

Table 12 shows the calculation of total resource cost of the renewable proxy plant, which is an Oregon wind resource with a 35% capacity factor from 2015 IRP Update. The total cost of the Oregon wind resource is used in the calculation of standard renewable avoided cost rates as shown in "**Exhibits 5 through 8"**.

Table 13 shows the calculation of on-peak and off-peak standard renewable avoided cost prices by applying on-peak and off-peak factors. On-peak and off-peak factors are calculated as a ratio of the average annual on-peak Mid-C market price to the flat Mid-C market price.

Exhibit 1- Std Base Load QF tab shows the calculation of proposed standard avoided cost rates for a base load QF. On and off-peak avoided cost rates are based on blended market rates for 2016-2027. For 2028 and beyond, the off-peak price is based on the fuel and capitalized energy cost of the proxy CCCT. The on-peak price includes a capacity adder based on the fixed costs a thermal proxy CCCT.

Exhibit 2- Std Wind QF tab shows the calculation of proposed standard avoided cost rates for a wind QF. On and off-peak avoided cost rates are based on blended market rates for 2016-2027. For 2028 and beyond, the off-peak price is based on the fuel and capitalized energy cost of the proxy CCCT. The on-peak price includes a capacity adder calculated based on fixed costs of the thermal proxy CCCT adjusted by the expected capacity contribution of a wind QF as identified in the 2015 IRP (wind: 25.4%). Standard avoided cost rates for a wind QF are reduced by a wind integration charge of $3.06/MWh ($2014).

Exhibits 3 & 4- Std Solar QF tab shows the calculation of proposed standard avoided cost rates for a solar QF. On and off-peak avoided cost rates are based on blended market rates for 2016-2027. For 2028 and beyond, the off-peak price is based on the fuel and capitalized energy cost of the proxy CCCT. The on-peak price includes a capacity adder calculated based on the fixed costs a thermal proxy CCCT adjusted by expected capacity contribution of a solar QF as identified in the 2015 IRP (fixed solar: 32.2%, tracking solar: 36.7%).

Exhibit 5- Renewable Base Load tab shows the calculation of proposed standard renewable avoided cost rates for a Renewable Base Load QF. On- and off-peak renewable avoided cost rates are based on blended market rates for 2016-2017. For 2018 and beyond, on- and off-peak prices are based on on-peak and off-peak prices of the renewable wind proxy resource as calculated in Table 12 and Table 13. The standard renewable on-peak price includes a capacity adder calculated based on the fixed costs of a thermal proxy CCCT, adjusted by the incremental capacity contribution of a renewable base load QF relative to the avoided renewable wind resource. The renewable avoided cost rates for a base load QF are increased by the avoided wind integration charge of $3.06/MWh ($2014) during the renewable resource deficiency period.

Exhibit 6- Renewable Wind tab shows the calculation of proposed standard renewable avoided cost rates for a Wind QF. On- and off-peak renewable avoided cost rates are based on blended market rates for 2016-2017. For 2018 and beyond, on- and off-peak prices are based on on-peak and off-peak prices of the renewable wind proxy resource as calculated in Table 12 and Table 13.

Exhibits 7 & 8- Renewable Solar tab shows the calculation of proposed standard renewable avoided cost rates for a Renewable Solar QF. On- and off-peak renewable avoided cost rates are based on blended market rates for 2016-2017. For 2018 and beyond, on- and off-peak prices are based on on-peak and off-peak prices of the renewable wind proxy resource as calculated in Table 12 and Table 13. The standard renewable on-peak price includes a capacity adder calculated based on the fixed costs of a thermal proxy CCCT, adjusted by the incremental capacity contribution of a renewable Fixed and Tracking Solar QF relative to the avoided renewable wind resource. The standard renewable avoided cost rates for fixed and tracking solar QF resources are increased by the avoided wind integration charge of $3.06/MWh ($2014) during the renewable resource deficiency period.

Exhibit 9– Blending tab shows the market blending used to weight the Company's Official Forward Price Curve on-peak and off-peak market prices at COB, Palo Verde and Mid-Columbia by month, which are used in the calculation of rates shown in **Table 2.**