PACIFIC POWER
A DIVISION OF PACIFICORP

825 NE Multnomah, Suite 2000
Portland, Oregon 97232

December 31, 2019

VIA ELECTRONIC FILING
AND OVERNIGHT DELIVERY

Public Utility Commission of Oregon
201 High Street SE, Suite 100
Salem, OR 97301-3398

Attn: Filing Center

Re: UM 2049—PacifiCorp's Renewable Portfolio Standard Implementation Plan 2021–2023

On December 20, 2019, the Public Utility Commission of Oregon (Commission) issued Order No. 19-447 adopting the Staff Report for the December 17, 2019 Public Meeting recommending that the Commission waive the requirements of OAR 860-083-0400(2)-(5) for the 2020 Renewable Portfolio Standard Implementation Plan compliance filings (Order). The Order waives these requirements in order to allow time for conclusion of certain pending renewable portfolio standard (RPS) rulemakings that will impact the company's RPS planning process and associated forecasted incremental costs.

In compliance with ORS 469A.075, OAR 860-083-0400(1) and (6)-(10), and Order No. 19-447, PacifiCorp d/b/a Pacific Power encloses for filing its Oregon Renewable Portfolio Standard Implementation Plan for the compliance years 2021-2023 (2021-2023 Plan).

This filing includes confidential and public versions of the RPS Implementation Plan attachments. In addition, enclosed is a compact disc containing confidential work papers associated with this filing. Confidential material in support of this filing is provided under Order No. 19-454.

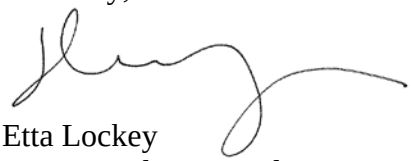
PacifiCorp respectfully requests that all data requests in this docket be addressed to:

By email (preferred): datarequest@pacificorp.com

By regular mail: Data Request Response Center
PacifiCorp
825 NE Multnomah Street, Suite 2000
Portland, Oregon 97232

Please direct any informal questions concerning this filing to Cathie Allen, Regulatory Affairs Manager, at (503) 813-5934.

Sincerely,



Etta Lockey
Vice President, Regulation

Enclosures

CERTIFICATE OF SERVICE

I certify that I served a true and correct copy of **PacifiCorp's Renewable Portfolio Standard Implementation Plan 2021-2023** on the parties listed below via electronic mail delivery in compliance with OAR 860-001-0180. Parties qualified to receive confidential information in this docket will receive the confidential documents via overnight delivery.

Service List
UM 1914

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Dated this 31st day of December, 2019.

Jennifer Angell
Regulatory Project Manager

PacifiCorp
Oregon Renewable Portfolio Standard
Implementation Plan
2021 through 2023

In accordance with ORS 469A.075, OAR 860-083-0400[1], and Order No. 19-447, PacifiCorp, d/b/a Pacific Power (Company or PacifiCorp), respectfully submits its 2021 through 2023 Oregon Renewable Portfolio Implementation Plan (2021–2023 Plan) to the Public Utility Commission of Oregon (Commission).

Summary

The 2021–2023 Plan shows that PacifiCorp intends to meet Oregon Renewable Portfolio Standard (RPS) targets during compliance years 2021 to 2023 with a combination of bundled and unbundled renewable energy certificates (RECs) from existing Oregon-eligible renewable resources and resources under development that are anticipated to be Oregon RPS-eligible.

The 2021–2023 Plan was prepared with information consistent with PacifiCorp's 2017 Renewable Portfolio Implementation Plan (RPIP) and its 2019 Integrated Resource Plan (IRP), unless stated otherwise.[2] The Company's IRP process and its filed documentation are based on the best available information at the time the IRP was prepared. PacifiCorp's 2019 IRP Action Plan represents a road map for implementation of the preferred portfolio. Consistent with the 2019 IRP Action Plan and preferred portfolio, the 2021–2023 Plan incorporates additional generation from wind resources added in the 2020 timeframe, as well as new solar qualifying facilities in the 2022 timeframe. The current economic and regulatory environments are continually changing, and PacifiCorp may modify its plan as state and federal legislation and regulations evolve. Such changes may materially impact resource acquisitions and the timing of those acquisitions.

In the 2021–2023 Plan, the Company included renewable resources that have been acquired or are under contract and received Oregon Department of Energy (ODOE) certification to qualify as eligible for the Oregon RPS. The 2021–2023 Plan also includes resources anticipated to receive certification as eligible for the Oregon RPS under ORS 469A.025. The 2021–2023 Plan also assumes that all qualifying resources will be recertified with ODOE to maintain eligibility through the 2021 to 2023 reporting period. As shown in the 2021–2023 Plan, the existing qualifying resources and resources under development will enable PacifiCorp to meet the 2021 to 2023 Oregon RPS targets. The 2021–2023 Plan currently assumes that PacifiCorp will use its bank of bundled RECs and that the Company will not purchase additional unbundled RECs to meet RPS targets in the 2021 to 2023 reporting period.

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[1]The Commission granted a waiver in Order No. 19-447 of OAR 860-083-0400(2) through (5) for the 2019 Renewable Portfolio Implementation Plan covering the time period 2021 to 2023 to allow time for the Commission, staff, and parties to address various RPS-related issues pending in dockets AR 610, 616, 617, and 622.

[2] PacifiCorp's 2019 IRP was filed with the Commission on October 18, 2019.

Similar to PacifiCorp's 2019 to 2023 implementation plan[3] (the 2019-2023 Plan), the 2021–2023 Plan shows that for some of the eligible resources, the expected incremental costs are positive (costs higher than a proxy resource), while for other resources, the expected incremental costs are negative (costs less than a proxy resource). However, using the methodology established by Commission-adopted rules, the 2021–2023 Plan shows that the expected incremental costs do not trigger the four percent cost limit under ORS 469A.100.

Implementation Plan

For the 2021–2023 Plan, the Company anticipates complying with the applicable Oregon RPS requirements using bundled and unbundled RECs[4]. The 2021–2023 Plan assumes that RECs with the shortest lives will be used first for RPS compliance before RECs with longer or unlimited lives. The Company does not plan to use any bundled RECs issued between January 1 through March 31 of the year following the compliance year or alternative compliance payments.

The format used in the 2021–2023 Plan is to state each requirement, followed by PacifiCorp's response to each of the stated subsections.

[3] PacifiCorp's 2019-2023 Plan was acknowledged by the Commission on May 23, 2018 in Docket No. UM 1914.
[4] All of the unbundled RECs that the Company intends to use for compliance during this period were acquired as part of the Company's 2016 REC Request for Proposals (RFP). PacifiCorp continues to treat as unbundled RECs the portion of RECs purchased under the 2016 REC RFP where the energy from the resources is allocated to states other than Oregon. However, as of this filing there is no state law or Commission order requiring the RECs in question to be treated as unbundled. For a discussion of this issue see Docket No. UE 313, Order No. 17-019 at Appendix A pp. 10-11. PacifiCorp understands that this issue is intended to be resolved as part of the recently opened RPS rulemaking in Docket No. AR 617 and accordingly has not proposed any changes from those discussed in Docket No. UE 313 as part of this 2021–2023 Plan.

ORS 469A.075(2)(a)
Annual targets for acquisition and use of qualifying electricity. The annual megawatt-hour target for compliance with the applicable renewable portfolio standard based on the forecast of electricity sales to its Oregon retail electricity customers.

Response:

Table 1 below provides the estimated annual megawatt-hour (MWh) target for compliance, based on PacifiCorp's March 2019 load forecast.[5]

Table 1	**2021**	**2022**	**2023**
Applicable RPS Standard as % of Electricity Sold	20%	20%	20%
Estimated PacifiCorp Oregon RPS Target (MWh)	2,694,140	2,718,925	2,716,549

Table 2 below shows the generating facilities that have been certified by ODOE as eligible for the Oregon RPS program and resources that are under development and expected to be certified as eligible for the Oregon RPS program. The generating facilities, either owned by the Company or under contract, are expected to provide RECs for compliance with the Oregon RPS during the 2021 to 2023 reporting period.

Table 2 also lists the year the generating facilities became operational, or are expected to become operational, the energy source, and the state where each facility is located. **Confidential Attachment B** provides Oregon's allocation of actual and expected annual MWh output for each resource.

[5] Consistent with the 2019 IRP, the Company used the March 2019 load forecast for the 2021-2023 Plan.

PacifiCorp
Oregon Renewable Portfolio Standard
Implementation Plan
2021 through 2023

Table 2

Energy Source	Generating Facility	State	Commercial Operation Year
BIOGAS	Hill Air Force Base	UT	2005
GEOTHERMAL	Blundell II	UT	2007
WIND	Campbell Hill-Three Buttes (PPA)	WY	2009
	Cedar Springs Wind, LLC*	WY	2020
	Cedar Springs Wind III, LLC*	WY	2020
	Cedar Springs Transmission*	WY	2020
	Chevron Casper Wind Farm (PPA)	WY	2009
	Combine Hills (PPA)	OR	2003
	Dunlap I	WY	2010
	Ekola Flats Wind*	WY	2020
	Foote Creek I	WY	1999
	Foote Creek II	WY	1999
	Foote Creek III	WY	1999
	Glenrock	WY	2008
	Glenrock III	WY	2009
	Goodnoe Hills	WA	2008
	High Plains	WY	2009
	Latigo	WY	2016
	Leaning Juniper I	OR	2006
	Marengo	WA	2007
	Marengo II	WA	2008
	McFadden Ridge	WY	2009
	Mountain Wind Power (PPA)	WY	2008
	Mountain Wind Power II (PPA)	WY	2008
	Pioneer Wind	WY	2016
	Rock River I (PPA)	WY	2001
	Seven Mile Hill I	WY	2008
	Seven Mile Hill II	WY	2008
	TB Flats Wind I-II*	WY	2020
	Top of the World (PPA)	WY	2010
	Wolverine Creek (PPA)	ID	2006
HYDRO	Ashton	ID	1917
	Big Fork	MT	1929
	Clearwater 1	OR	1953
	Clearwater 2	OR	1953
	Copco 1	CA	1918
	Cutler	UT	1927
	Fish Creek	OR	1952
	Grace	ID	1908
	JC Boyle	OR	1958
	Lemolo 1	OR	1955
	Lemolo 2	OR	1956
	Oneida	ID	1915
	Pioneer	UT	1897
	Prospect 2	OR	1928
	Prospect 3	OR	1932
	Slide Creek	OR	1951
	Soda	ID	1924
	Soda Springs	OR	1952

	Toketee	OR	1950
	Yale	WA	1953
SOLAR CAPACITY STANDARD	Black Cap	OR	2012

*Indicates resource has not been included in previous Oregon Implementation Plans.

Table 2

Energy Source	Generating Facility	State	Commercial Operation Year
OREGON SOLAR INCENTIVE	Oregon Solar Incentive Program - Central Oregon (CO 1)	OR	2010
	Oregon Solar Incentive Program - Central Oregon (CO 2)	OR	2011
	Oregon Solar Incentive Program - Central Oregon (CO 3)	OR	2013
	Oregon Solar Incentive Program - Central Oregon (CO 4)	OR	2016
	Oregon Solar Incentive Program - Columbia River (CR 1)	OR	2011
	Oregon Solar Incentive Program - Columbia River (CR 2)	OR	2014
	Oregon Solar Incentive Program - Eastern Oregon (EO 1)	OR	2010
	Oregon Solar Incentive Program - Eastern Oregon (EO 2)	OR	2011
	Oregon Solar Incentive Program - Portland Oregon (PO 1)	OR	2010
	Oregon Solar Incentive Program - Portland Oregon (PO 2)	OR	2013
	Oregon Solar Incentive Program - Portland Oregon (PO 3)	OR	2016
	Oregon Solar Incentive Program - Southern Oregon (SO 1)	OR	2010
	Oregon Solar Incentive Program - Southern Oregon (SO 2)	OR	2011
	Oregon Solar Incentive Program - Southern Oregon (SO 3)	OR	2011
	Oregon Solar Incentive Program - Southern Oregon (SO 4)	OR	2012
	Oregon Solar Incentive Program - Southern Oregon (SO 5)	OR	2012
	Oregon Solar Incentive Program - Southern Oregon (SO 6)	OR	2013
	Oregon Solar Incentive Program - Southern Oregon (SO 7)	OR	2013
	Oregon Solar Incentive Program - Southern Oregon (SO 8)	OR	2013
	Oregon Solar Incentive Program - Southern Oregon (SO 9)	OR	2013
	Oregon Solar Incentive Program - Southern Oregon (SO 10)	OR	2014
	Oregon Solar Incentive Program - Southern Oregon (SO 11)	OR	2014
	Oregon Solar Incentive Program - Southern Oregon (SO 12)	OR	2015
	Oregon Solar Incentive Program - Southern Oregon (SO 13)	OR	2016
	Oregon Solar Incentive Program - Willamette Valley (WV 1)	OR	2010
	Oregon Solar Incentive Program - Willamette Valley (WV 2)	OR	2011
	Oregon Solar Incentive Program - Willamette Valley (WV 3)	OR	2012
	Oregon Solar Incentive Program - Willamette Valley (WV 4)	OR	2013
	Oregon Solar Incentive Program - Willamette Valley (WV 5)	OR	2013
	Oregon Solar Incentive Program - Willamette Valley (WV 6)	OR	2013
	Oregon Solar Incentive Program - Willamette Valley (WV 7)	OR	2014
	Oregon Solar Incentive Program - Willamette Valley (WV 8)	OR	2015
	Oregon Solar Incentive Program - Willamette Valley (WV 9)	OR	2015
	Oregon Solar Incentive Program - Willamette Valley (WV 10)	OR	2017
	Lakeview	OR	2012
	Lakeview II	OR	2013
	Oregon Solar Incentive Program - (Joseph Community) Wallowa County	OR	2011
	Powell Butte	OR	2014
	Crook County Solar	OR	2014
	Confederated Tribes of Warm Springs (CTWS)	OR	2014
	Solwatt	OR	2012
	Solwatt II	OR	2014
	Bourdet	OR	2014
	Bourdet II	OR	2016
	Keeton 1	OR	2016
	Keeton 2	OR	2016
	Hammerich 1	OR	2016
	Hammerich 2	OR	2016
	Oregon Solar Incentive Program - Remaining Capacity	OR	2016-2018
SOLAR	Pavant Solar II LLC	UT	2016
	Pavant Solar, LLC	UT	2015
	Enterprise Solar, LLC	UT	2016

	Adams Solar Center, LLC	OR	2018
	Bear Creek Solar Center, LLC	OR	2018
	Bly Solar Center, LLC	OR	2018
	Elbe Solar Center, LLC	OR	2018
	Sage Solar 1*	WY	2019
	Sage Solar 2*	WY	2019
	Sage Solar 3*	WY	2019
	Sweetwater Solar*	WY	2018

*Indicates resource has not been included in previous Oregon Implementation Plans.

ORS 469A.075(2)(b)
The estimated cost of meeting the annual targets, including: The cost of transmission, firming, shaping and integrating qualifying electricity; The cost of alternative compliance payments and the cost of acquiring renewable energy certificates (RECs); A description of base case incremental cost calculations, using the cost of the RECs retired in a year; Reporting on the incremental cost of RECs generated in each year; and Sensitivities for the use of 20% unbundled RECs and different gas price scenarios.

Response:

Table 3 shows the forecast of the expected incremental costs, on an Oregon-allocated basis, for the qualifying electricity for generating facilities or contracts in service after June 6, 2007. Low impact hydroelectric facilities and qualifying generating facilities or contracts that went into service before June 6, 2007, are deemed to have zero incremental costs, in accordance with OAR 860-083-0100(1)(i).[6]

Using a September 2018 official forward price curve (OFPC) that was used as a base case in the 2019 IRP, **Table 3** below lists the incremental costs for each qualifying resource. Qualifying resources with a positive expected incremental cost represent costs higher than a proxy resource and negative costs (within brackets) represent a benefit relative to a proxy resource. The cost of new resources that were not included in the 2019–2023 RPIP filing are included in **Table 3** and marked with an asterisk.

[6] OAR 860-083-0100(1)(h) states that "[i]ncremental costs are deemed to be zero for qualifying electricity from generating facilities or contracts that became operational before June 6, 2007, and for certified low-impact hydroelectric facilities under ORS 469A.025(5)."

Table 3

2021–2023 Summary
Oregon Allocated Nominal Levelized Incremental Costs ($000)
For Specific Qualifying Resources

2019 IRP Base Case – September 2018 OFPC

Resource	2021	2022	2023
Blundell II	($516)	($518)	($520)
Campbell Hill-Three Buttes	$1,580	$1,584	$1,590
Cedar Springs Wind I (PPA)*	($5,075)	($5,091)	($5,109)
Cedar Springs Wind II (owned)*	($7,523)	($7,546)	($7,573)
Cedar Springs Wind III (PPA)*	($9,101)	($9,129)	($9,161)
Dunlap I	($1,330)	($1,334)	($1,339)
Ekola Flats Wind*	($3,725)	($3,737)	($3,750)
Glenrock	($458)	($459)	($461)
Glenrock III	($66)	($66)	($66)
Goodnoe Hills[7]	($461)	($463)	($464)
High Plains	($42)	($42)	($42)
McFadden Ridge	($295)	($296)	($297)
Marengo	($725)	($728)	($730)
Marengo II	($105)	($105)	($106)
Mountain Wind Power	$274	$275	$276
Mountain Wind Power II	$875	$878	$881
Seven Mile Hill I	($1,472)	($1,476)	($1,481)
Seven Mile Hill II	($301)	($302)	($303)
TB Flats Wind I-II*	($7,123)	($7,145)	($7,170)
Top of the World	$3,279	$3,289	$3,301
Pioneer Wind Park I QF[8]	($498)	($499)	($501)

[7] Incremental cost of repowering provided. Repowering for this resource was not contemplated in the 2017 RPIP.
[8] A QF is a qualifying facility as defined by the Public Utility Regulatory Policies Act.

Table 3

2021–2023 Summary
Oregon Allocated Nominal Levelized Incremental Costs ($000)
For Specific Qualifying Resources

2019 IRP Base Case – September 2018 OFPC

Resource	2021	2022	2023
Latigo Wind Park QF	$739	$742	$744
Pavant II Solar QF	($245)	($245)	($246)
Black Cap Solar	$113	$113	$113
Adams Solar QF	$201	$202	$203
Bear Creek Solar QF	$223	$224	$224
Bly Solar QF	$181	$182	$183
Elbe Solar QF	$214	$215	$216
Enterprise Solar QF	($1,000)	($1,003)	($1,007)
Pavant Solar QF	($831)	($834)	($837)
Sage Solar 1 QF*	($640)	($642)	($644)
Sage Solar 2 QF*	($640)	($642)	($644)
Sage Solar 3 QF*	($532)	($533)	($535)
Sweetwater Solar QF*	($2,607)	($2,616)	($2,625)
OSIP_2010	$131	$131	$131
OSIP_2011	$1,271	$1,271	$1,271
OSIP_2012	$816	$816	$816
OSIP_2013	$967	$967	$967
OSIP_2014	$621	$621	$621
OSIP_2015	$234	$234	$234
OSIP_2016	$109	$109	$109
OSIP_2017	$28	$28	$28

Table 4 below lists the cost of acquiring unbundled RECs based on the weighted average cost of the Company's purchases through the 2016 REC RFP multiplied by the total number of unbundled RECs expected to be used for compliance in a given year.[9] RECs with the shortest life are assumed to be used first.

Table 4

2021–2023 Summary
Oregon Allocated Incremental Costs ($000)
For Unbundled RECs

2019 IRP Base Case- September 2018 OFPC

Resource	2021	2022	2023
Enterprise Solar	$126	$266	$279
Pavant Solar	$126	$266	$279
Adams Solar	$126	$266	$279
Bear Creek Solar	$126	$266	$279
Bly Solar	$126	$266	$279
Elbe Solar	$126	$266	$279

Confidential Attachment C provides an explanation of the key assumptions that PacifiCorp used to forecast the expected incremental costs of renewable resources during the 2021 to 2023 reporting period, consistent with OAR 860-083-0100 and Order No. 12-272 in docket UM 1570.

Table 5 summarizes the results of an additional gas price scenario using a more recent PacifiCorp's November 2019 Official Forward Price Curve.

Table 5

2021–2023 Summary
Oregon Allocated Nominal Levelized Incremental Costs ($000)
For Specific Qualifying Resources

Additional Scenario - November 2019 OFPC

Resource	2021	2022	2023
Blundell II	($490)	($491)	($493)

[9] Refer to PAC OR 2021–2023 Plan Total Compliance Cost Workpaper CONFIDENTIAL

Table 5

2021–2023 Summary
Oregon Allocated Nominal Levelized Incremental Costs ($000)
For Specific Qualifying Resources

Additional Scenario - November 2019 OFPC

Resource	2021	2022	2023
Campbell Hill-Three Buttes	$1,656	$1,661	$1,667
Cedar Springs Wind I (PPA)*	($4,277)	($4,291)	($4,306)
Cedar Springs Wind II (owned)*	($6,695)	($6,716)	($6,739)
Cedar Springs Wind III (PPA)*	($8,562)	($8,589)	($8,619)
Dunlap I	($1,049)	($1,053)	($1,056)
Ekola Flats Wind*	($2,825)	($2,833)	($2,843)
Glenrock	($253)	($253)	($254)
Glenrock III	$14	$14	$14
Goodnoe Hills[10]	($381)	($382)	($383)
High Plains	$178	$179	$179
McFadden Ridge	($233)	($233)	($234)
Marengo	($490)	($492)	($493)
Marengo II	$17	$17	$18
Mountain Wind Power	$321	$322	$323
Mountain Wind Power II	$938	$941	$945
Seven Mile Hill I	($1,242)	($1,246)	($1,250)
Seven Mile Hill II	($256)	($257)	($258)
TB Flats Wind I-II*	($5,278)	($5,294)	($5,313)
Top of the World	$3,454	$3,465	$3,477
Pioneer Wind Park I QF	($498)	($499)	($501)
Latigo Wind Park QF	$739	$742	$744
Pavant II Solar QF	($245)	($245)	($246)

[10] Incremental cost of repowering provided. Repowering for this resource was not contemplated in the 2017 RPIP.

Table 5

2021–2023 Summary
Oregon Allocated Nominal Levelized Incremental Costs ($000)
For Specific Qualifying Resources

Additional Scenario - November 2019 OFPC

Resource	2021	2022	2023
Black Cap Solar	$113	$113	$113
Adams Solar QF	$199	$200	$201
Bear Creek Solar QF	$221	$222	$222
Bly Solar QF	$180	$180	$181
Elbe Solar QF	$212	$213	$214
Enterprise Solar QF	($1,000)	($1,003)	($1,007)
Pavant Solar QF	($831)	($834)	($837)
Sage Solar 1*	($602)	($604)	($606)
Sage Solar 2*	($602)	($604)	($606)
Sage Solar 3*	($500)	($502)	($503)
Sweetwater Solar*	($2,524)	($2,532)	($2,541)
OSIP_2010	$132	$132	$132
OSIP_2011	$1,271	$1,271	$1,271
OSIP_2012	$816	$816	$816
OSIP_2013	$967	$967	$967
OSIP_2014	$621	$621	$621
OSIP_2015	$234	$234	$234
OSIP_2016	$109	$109	$109
OSIP_2017	$28	$28	$28

Confidential Attachment D provides additional detail of the forecast of the expected incremental cost calculation, consistent with the methodology in OAR 860-083-0100. The calculations are consistent with assumptions in the Company's 2017 IRP, as well as the additional sensitivity (Scenario 6) based on the November 2019 OFPC.

Resource and Compliance Strategy Changes Between This Plan and 2021 Renewable Portfolio Standard Implementation Plan
Major changes/new resources have been acknowledged or proposed and how that could change their compliance strategy between now and the next scheduled RPIP in 2021.

Response:

PacifiCorp's 2019 IRP includes wind resources added in the 2020 timeframe as well as new solar qualifying facilities in the 2022 timeframe. However, PacifiCorp does not expect these additional resources to change the Company's compliance strategy between now and the next scheduled Renewable Portfolio Implementation Plan filing in 2021.

OAR 860-083-0400(6)
An implementation plan must provide a detailed explanation of how the implementation plan complies, or does not comply, with any conditions specified in a Commission acknowledgement order on the previous implementation plan and any relevant conditions specified in the most recent acknowledgement order on an integrated resource plan filed or updated by the electric company.

Response:

In Order No. 14-267 in docket UM 1681, the Commission acknowledged PacifiCorp's 2015–2019 Plan with the following two conditions for the 2017–2021 Plan and subsequent Plans:

- Include a "non-confidential summary of RPS total incremental costs for each scenario analyzed…."[11]

Attachment E provides a summary of the RPS incremental costs by resource for each scenario analyzed in the 2021–2023 Plan.

- Include "in subsequent [implementation plans] a scenario that uses the base case price curve assumptions (medium gas and medium CO2 prices) similar that

[11] *In the Matter of PacifiCorp, dba Pacific Power, Renewable Portfolio Standard Implementation Plan 2015–2019,* Docket No. UM 1681, Order 14-267 at Appendix A (July 22, 2014).

used in the other scenarios in the [implementation plan], with the assumption the Company maximizes the use of unbundled RECs for each year analyzed in the [implementation plan] and assuming an unbundled REC price equal to the weighted average price paid for unbundled RECs used for compliance in their last compliance filing."[12]

Table 9 below provides a sensitivity for the base case scenario (September 28, 2018 OFPC) that maximizes the use of unbundled RECs in each year of the 2021–2023 Plan. For this scenario, the Company assumed an unbundled REC price of $1.64 per REC, consistent with PacifiCorp's 2018 Compliance Report filed in docket UM 2014, May 31, 2019.[13]

As discussed above, PacifiCorp's REC retirement strategy is to retire shorter-lived RECs first followed by longer- or unlimited-lived RECs. This strategy is applied to both bundled and unbundled RECs. PacifiCorp may periodically issue solicitations for unbundled RECs to assess cost-effective compliance opportunities. However, given the significant REC bank projected into future years, PacifiCorp has not sought to purchase additional unbundled RECs in the 2021–2023 Plan.

Table 9

Sensitivity - Annual Unbundled RECs Maximized (20%)
2019 IRP Base Case September 2018 OFPC

	MWh		
	2021 Forecast	**2022 Forecast**	**2023 Forecast**
Oregon Renewable Portfolio Standard Requirement	2,694,140	2,718,925	2,716,549
Planned Compliance Method (MWh)			
Bundled RECs	2,155,312	2,175,140	2,173,239
Unbundled RECs	538,828	543,785	543,310
Forecasted Cost ($/MWh)			
Bundled REC (Average $/$MWh)	$ (10.34)	$ (10.39)	$ (10.34)
Unbundled REC (Average $/MWh)	$ 1.64	$ 1.64	$ 1.64
Total Forecasted Incremental Cost of Compliance	$ (21,407,925)	$ (21,710,451)	$ (21,583,826)
Bundled REC	$ (22,289,749)	$ (22,600,388)	$ (22,472,985)

[12] *Id*.
[13] Refer to PAC OR 2021–2023 Plan Unbundled RECs Workpaper CONFIDENTIAL.

Unbundled REC	$ 881,824	$ 889,937	$ 889,159

In Order No. 17-010 in docket UM 1790, the Commission acknowledged PacifiCorp's 2017–2021 Plan with the following conditions for the 2017–2021 Plan and subsequent Plans:

> PacifiCorp must comply with the following steps when it commences a resource procurement action, for the purpose of complying with the Renewable Portfolio Standards law, that materially deviates from its most recently filed Integrated Resource Plan or RPIP:
>
> Calculate new incremental costs with the new resource or resources included over a time period acceptable to PacifiCorp and Staff; and
>
> Respond to requests by the Commission regarding its new analysis arising out of the calculation set forth above; and
>
> Participate in a stakeholder workshop to identify opportunities for revisions to the RPIP process and requirements.[14]

PacifiCorp has not commenced a resource procurement action for the purpose of complying with the RPS that materially deviates from the 2019 IRP.

In Order No. 18-186 in docket UM 1914, the Commission acknowledged PacifiCorp's 2019–2023 Plan with no additional conditions.

OAR 860-083-0400(7)
If there are funds in holding accounts under ORS 469A.180(4) and if the electric company has not filed a proposal for expending such funds for the purposes allowed under ORS 469A.180(5), the implementation plan must include the electric company's plans for expending or holding such funds. If the plan is to hold such funds, the plan should indicate under what conditions such funds should be expended.

Response:

The Company does not have any funds in holding accounts authorized in accordance with ORS 469A.180(4). Accordingly, this requirement is not applicable at this time.

[14] *In the Matter of PacifiCorp, dba Pacific Power, 2017-2021 Renewable Portfolio Standard Implementation Plan,* Docket UM 1790, Order 17-010 at 1 (Jan. 13, 2017).

OAR 860-083-0400(9)
(a) Each electric company must post on its website the public portion of its most recent implementation plan under this rule within 30 days after a Commission acknowledgement order has been issued, including any conditions specified by the Commission under ORS 469.075(3). (b) Each electric company must provide a copy of the public portions of the most recently filed implementation plan to any person upon request, until the Commission has issued an acknowledgement order on such plan.

Response:

The Company will post the 2021–2023 Plan on its website within 30 days after a Commission acknowledgement order is issued. The Company will provide the public portions of the 2021–2023 Plan to any persons upon request.

OAR 860-083-0400(10)
Consistent with Commission orders for disclosure under OAR 860-038-0300, each electric company must provide information about the implementation plan to its customers by bill insert or other Commission-approved method. The information must be provided within 90 days of final action by the Commission on the plan or coordinated with the next available insert required under 860-038-0300. The information must include the URL address for the implementation plan posted under subsection (9)(a) of this rule.

Response:

In compliance with OAR 860-038-0300, the Company will provide information about the 2021–2023 Plan to its customers via bill inserts within 90 days of the final action by the Commission.

PacifiCorp
Renewable Portfolio Standard Oregon
Implementation Plan
2021-2023

Confidential Attachment B

Bundled and Unbundled RECs
Expected Annual MWh Output
(Total Company and Oregon Share)

(Redacted Version)

PacifiCorp Oregon - 2021-2023 RPS Implementation Plan
Attachment B - Oregon's Renewable Energy Credit Share Per Allocation Factors (MWh)[1]

		State	COD[2]	WREGIS ID	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
					Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Forecast[3]	Forecast[3]	Forecast[3]	Forecast[3]	Forecast[3]
BIOGAS	Hill Air Force Base	UT	2005	W1263 / W1273	0	0	0	0	3,797	3,689	3,453	3,558	3,751	4,351	2,566	3,575					
	Total Biogas								**3,797**	**3,689**	**3,453**	**3,558**	**3,751**	**4,351**	**2,566**	**3,575**					
GEOTHERMAL	Blundell II	UT	2007	W230	2,526	18,822	22,876	19,786	21,937	21,213	18,870	19,455	18,113	17,433	17,320	12,948					
	Total Geothermal				**2,526**	**18,822**	**22,876**	**19,786**	**21,937**	**21,213**	**18,870**	**19,455**	**18,113**	**17,433**	**17,320**	**12,948**					
WIND	Campbell Hill-Three Buttes (PPA)	WY	2009	W1383	0	0	10,987	78,605	95,012	88,168	85,121	84,600	75,688	88,859	80,308	80,575					
	Cedar Springs Wind, LLC [6]	WY	2020	TBD	0	0	0	0	0	0	0	0	0	0	0	0					
	Cedar Springs Wind III, LLC	WY	2020	TBD	0	0	0	0	0	0	0	0	0	0	0	0					
	Cedar Springs Transmission (BTA) [6]	WY	2020	TBD	0	0	0	0	0	0	0	0	0	0	0	0					
	Chevron Casper Wind Farm (PPA)	WY	2009	W1370	0	0	1,683	10,110	12,892	11,867	11,081	10,812	9,533	11,194	10,600	5,943					
	Combine Hills (PPA)	OR	2003	W189	117,181	114,458	104,572	104,663	118,643	108,721	102,419	107,568	91,036	116,764	93,507	113,680					
	Dunlap I	WY	2010	W1687	0	0	0	26,839	111,195	100,599	103,222	97,716	87,447	103,400	90,530	102,122					
	Ekola Flats Wind [6]	WY	2020	TBD	0	0	0	0	0	0	0	0	0	0	0	0					
	Foote Creek I	WY	1999	W201	15,666	18,091	14,242	14,650	16,656	13,251	13,469	15,558	12,586	17,365	15,425	16,392					
	Foote Creek II	WY	1999	W1363	0	0	0	0	0	0	0	763	1,327	1,449	1,400	1,547					
	Foote Creek III	WY	1999	W1141	0	0	0	0	0	0	0	8,336	16,083	20,215	17,074	19,200					
	Glenrock	WY	2008	W964	0	560	69,779	75,448	90,011	81,542	81,242	76,287	74,493	82,934	69,141	79,188					
	Glenrock III	WY	2009	W965	0	0	23,435	26,194	34,381	30,893	30,724	28,785	28,019	31,601	25,632	30,645					
	Goodnoe Hills	WA	2008	W536	232	54,050	65,244	55,620	63,226	57,344	57,269	55,304	48,072	59,591	49,462	60,072					
	High Plains	WY	2009	W1334	0	0	19,981	67,432	88,585	81,906	85,994	82,727	64,577	84,151	72,139	85,226					
	Latigo	WY	2016	W4909	0	0	0	0	0	0	0	0	0	21,709	39,859	40,569					
	Leaning Juniper I	OR	2006	W200	79,427	88,113	71,124	58,578	62,000	49,501	51,953	54,917	48,541	53,924	40,124	52,554					
	Marengo	WA	2007	W185	51,406	112,813	87,007	86,716	106,527	93,001	83,472	93,735	76,909	94,765	81,324	87,674					
	Marengo II	WA	2008	W772	0	22,114	43,504	43,359	51,329	46,038	38,962	44,589	35,485	45,343	39,525	42,854					
	McFadden Ridge	WY	2009	W1341	0	0	5,651	20,272	27,092	24,578	26,139	25,108	20,148	25,531	21,793	26,144					
	Mountain Wind Power (PPA)	WY	2008	W1022	0	21,888	35,272	39,153	49,250	44,474	42,065	48,893	36,164	42,820	42,465	41,382					
	Mountain Wind Power II (PPA)	WY	2008	W1023	0	16,401	55,752	52,948	63,599	59,065	57,418	65,199	47,122	56,225	55,904	57,083					
	Pioneer Wind	WY	2016	W5126	0	0	0	0	0	0	0	0	0	8,111	69,498	65,998					
	Rock River I (PPA)	WY	2001	W187	38,665	44,240	37,056	36,213	35,934	35,030	35,676	39,759	30,309	38,801	38,047	36,145					
	Seven Mile Hill I	WY	2008	W975	0	376	83,422	84,929	100,789	88,728	89,736	85,481	76,341	92,847	86,175	90,763					
	Seven Mile Hill II	WY	2008	W976	0	0	17,104	17,745	22,080	18,814	19,416	18,778	16,491	18,591	17,086	19,215					
	TB Flats Wind (I-II) [6]	WY	2020	TBD	0	0	0	0	0	0	0	0	0	0	0	0					
	Top of the World (PPA)	WY	2010	W1749	0	0	0	49,477	181,005	172,464	161,824	163,539	146,747	173,280	157,612	138,689					
	Wolverine Creek (PPA)	ID	2006	W188	40,868	47,992	42,262	42,485	52,451	46,266	38,811	46,892	36,785	46,527	44,360	44,656					
	Total Wind				**343,444**	**541,097**	**788,077**	**991,436**	**1,382,657**	**1,252,250**	**1,216,013**	**1,255,346**	**1,079,903**	**1,335,997**	**1,258,990**	**1,338,316**					
HYDRO	Ashton	ID	1917	W146	0	0	0	5,955	4,779	526	8,703	8,375	7,715	7,658	9,501	9,920					
	Big Fork	MT	1929	W179	199	324	332	353	382	362	317	336	288	332	233	285					
	Clearwater 1	OR	1953	W148	0	0	0	8,248	11,487	13,146	9,520	10,523	8,128	10,770	12,729	10,552					
	Clearwater 2	OR	1953	W149	0	0	0	7,783	14,875	14,042	9,924	11,454	8,274	12,091	17,453	9,623					
	Copco 1	CA	1918	W142	105	126	100	81	137	102	78	87	81	113	144	99					
	Cutler [4]	UT	1927	W151	136	628	1,004	13,221	41,743	13,421	8,363	10,533	9,328	17,351	38,043	18,513					
	Fish Creek	OR	1952	W153	0	0	0	9,820	12,189	11,105	3,973	6,157	2,044	9,274	10,903	3,845					
	Grace	ID	1908	W137	0	0	0	16,636	43,142	21,416	17,902	14,305	16,282	20,629	41,786	32,285					
	JC Boyle	OR	1958	W180	372	1,124	879	728	1,273	898	605	586	548	759	1,093	672					
	Lemolo 1 [4]	OR	1955	W157	3,446	4,281	3,581	29,188	44,405	43,184	31,220	35,939	31,804	35,682	45,082	32,538					
	Lemolo 2 [4]	OR	1956	W158	363	371	212	36,284	48,315	53,683	37,800	44,325	35,173	39,040	51,781	34,670					
	Oneida [4]	ID	1915	W160	803	746	699	7,464	20,418	8,549	7,144	5,534	7,430	10,609	24,257	16,131					
	Pioneer	UT	1897	W162	194	304	496	297	553	287	143	156	172	206	471	162					
	Prospect 2	OR	1928	W140	1,104	1,167	1,076	1,020	1,148	1,068	938	885	721	1,073	1,109	873					
	Prospect 3 [4]	OR	1932	W164	1,196	1,259	1,066	9,257	12,326	9,728	8,504	9,169	7,151	8,782	10,510	5,803					
	Slide Creek	OR	1951	W168	0	0	0	20,716	9,806	25,055	13,386	17,967	11,516	20,127	20,373	14,819					
	Soda	ID	1924	W170	0	0	0	3,658	9,283	5,192	4,089	3,871	3,869	4,833	8,781	7,821					
	Soda Springs	OR	1952	W171	0	0	0	13,598	18,743	13,105	11,537	13,796	8,824	16,261	15,564	11,494					
	Toketee	OR	1950	W173	0	0	0	49,510	69,665	68,399	49,366	57,754	47,363	61,967	65,779	50,833					
	Yale	WA	1953	W141	1,150	2,054	2,004	2,228	2,357	2,460	1,722	2,314	1,675	2,319	2,526	1,827					
	Total Hydro				**9,068**	**12,384**	**11,449**	**236,045**	**367,026**	**305,728**	**225,234**	**254,066**	**208,386**	**279,876**	**378,118**	**262,765**					
OREGON SOLAR INCENTIVE	Oregon Solar Incentive Program - Central Oregon (CO 1)	OR	2010	W1686	0	0	0	11	209	403	409	399	340	342	332	354					
	Oregon Solar Incentive Program - Central Oregon (CO 2)	OR	2011	W2391	0	0	0	0	7	194	393	397	388	397	394	375					
	Oregon Solar Incentive Program - Central Oregon (CO 3)	OR	2013	W3671	0	0	0	0	0	0	22	230	356	365	351	375					
	Oregon Solar Incentive Program - Central Oregon (CO 4)	OR	2016	W5049										25	49	47					
	Oregon Solar Incentive Program - Columbia River (CR 1)	OR	2011	W1970	0	0	0	0	126	192	263	327	357	344	301	330					
	Oregon Solar Incentive Program - Columbia River (CR 2)	OR	2014	W4436	0	0	0	0	0	0	0	0	41	14	13	12					
	Oregon Solar Incentive Program - Eastern Oregon (EO 1)	OR	2010	W1737	0	0	0	2	137	340	371	354	351	304	284	289					
	Oregon Solar Incentive Program - Eastern Oregon (EO 2)	OR	2011	W2611	0	0	0	0	0	116	200	298	378	364	384	384					
	Oregon Solar Incentive Program - Portland Oregon (PO 1)	OR	2010	W1738	0	0	0	2	81	189	299	310	311	278	298	323					
	Oregon Solar Incentive Program - Portland Oregon (PO 2)	OR	2013	W3672	0	0	0	0	0	0	17	111	220	251	269	298					
	Oregon Solar Incentive Program - Portland Oregon (PO 3)	OR	2016	W4910										97	115	111					
	Oregon Solar Incentive Program - Southern Oregon (SO 1)	OR	2010	W1806	0	0	0	3	362	419	453	437	513	409	420	408					

PacifiCorp Oregon - 2021-2023 RPS Implementation Plan
Attachment B - Oregon's Renewable Energy Credit Share Per Allocation Factors (MWh)[1]

		State	COD[2]	WREGIS ID	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
					Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Actual[3]	Forecast[3]	Forecast[3]	Forecast[3]	Forecast[3]	Forecast[3]
	Oregon Solar Incentive Program - Southern Oregon (SO 2)	OR	2011	W2240	0	0	0	0	161	420	573	508	515	472	445	513					
	Oregon Solar Incentive Program - Southern Oregon (SO 3)	OR	2011	W2392	0	0	0	0	35	453	537	484	482	451	472	458					
	Oregon Solar Incentive Program - Southern Oregon (SO 4)	OR	2012	W2690	0	0	0	0	0	316	467	450	427	403	395	423					
	Oregon Solar Incentive Program - Southern Oregon (SO 5)	OR	2012	W3207	0	0	0	0	0	8	438	436	405	403	425	431					
	Oregon Solar Incentive Program - Southern Oregon (SO 6)	OR	2013	W3516	0	0	0	0	0	0	302	412	417	422	385	398					
	Oregon Solar Incentive Program - Southern Oregon (SO 7)	OR	2013	W3554	0	0	0	0	0	0	182	408	399	380	382	380					
	Oregon Solar Incentive Program - Southern Oregon (SO 8)	OR	2013	W3673	0	0	0	0	0	0	8	375	386	394	413	366					
	Oregon Solar Incentive Program - Southern Oregon (SO 9)	OR	2013	W4084	0	0	0	0	0	0	0	275	338	406	345	379					
	Oregon Solar Incentive Program - Southern Oregon (SO 10)	OR	2014	W4187	0	0	0	0	0	0	0	152	446	415	400	431					
	Oregon Solar Incentive Program - Southern Oregon (SO 11)	OR	2014	W4485	0	0	0	0	0	0	0	1	363	314	139	329					
	Oregon Solar Incentive Program - Southern Oregon (SO 12)	OR	2015	W4576	0	0	0	0	0	0	0	0	146	356	425	515					
	Oregon Solar Incentive Program - Southern Oregon (SO 13)	OR	2016	W5521										4	12	15					
	Oregon Solar Incentive Program - Willamette Valley (WV 1)	OR	2010	W1739	0	0	0	6	253	280	314	308	313	300	315	318					
	Oregon Solar Incentive Program - Willamette Valley (WV 2)	OR	2011	W2326	0	0	0	0	14	202	380	395	391	427	391	355					
	Oregon Solar Incentive Program - Willamette Valley (WV 3)	OR	2012	W3208	0	0	0	0	0	25	333	329	326	327	307	302					
	Oregon Solar Incentive Program - Willamette Valley (WV 4)	OR	2013	W3396	0	0	0	0	0	0	367	313	243	323	306	308					
	Oregon Solar Incentive Program - Willamette Valley (WV 5)	OR	2013	W3410	0	0	0	0	0	0	256	323	328	356	348	320					
	Oregon Solar Incentive Program - Willamette Valley (WV 6)	OR	2013	W3673	0	0	0	0	0	0	44	348	340	326	337	341					
	Oregon Solar Incentive Program - Willamette Valley (WV 7)	OR	2014	W4085	0	0	0	0	0	0	0	118	323	340	393	357					
	Oregon Solar Incentive Program - Willamette Valley (WV 8)	OR	2015	W4643	0	0	0	0	0	0	0	0	37	331	308	306					
	Oregon Solar Incentive Program - Willamette Valley (WV 9)	OR	2015	W4858										260	299	300					
	Oregon Solar Incentive Program - Willamette Valley (WV 10)	OR	2017	W5541										0	46	44					
	Lakeview	OR	2012	W3468	0	0	0	0	0	0	248	596	699	660	593	679					
	Lakeview II	OR	2013	W3960	0	0	0	0	0	0	0	839	898	910	863	880					
	Oregon Solar Incentive Program - (Joseph Community) Wallowa County	OR	2011	W2448	0	0	0	0	44	666	746	740	667	685	669	614					
	Powell Butte	OR	2014	W4274	0	0	0	0	0	0	0	123	288	302	297	307					
	Crook County Solar	OR	2013	W3847	0	0	0	0	0	0	244	973	870	933	874	915					
	Confederated Tribes of Warm Springs (CTWS)	OR	2014	W4105	0	0	0	0	0	0	0	292	309	330	295	325					
	Solwatt	OR	2012	W2968	0	0	0	0	0	257	484	521	509	506	511	300					
	Solwatt II	OR	2014	W4273	0	0	0	0	0	0	0	110	294	304	282	541					
	Bourdet	OR	2014	W4486	0	0	0	0	0	0	0	0	95	135	116	165					
	Bourdet II	OR	2016	W4998	0	0	0	0	0	0	0	0		86	62	161					
	Keeton 1	OR	2016	W5420	0	0	0	0	0	0	0	0	0	0	159	209					
	Keeton 2	OR	2016	W5421	0	0	0	0	0	0	0	0	0	0	181	171					
	Hammerich 1	OR	2016	W5418	0	0	0	0	0	0	0	0	0	0	175	200					
	Hammerich 2	OR	2016	W5419	0	0	0	0	0	0	0	0		0	169	193					
	Oregon Solar Incentive Program - Remaining Capacity	OR	2016-2018	W4910																	
	Total Oregon Solar Incentive							**25**	**1,429**	**4,480**	**8,350**	**12,692**	**14,509**	**15,451**	**15,744**	**16,555**					
SOLAR	Adams Solar Center, LLC [7]	OR	2018	W7039												696					
	Bear Creek Solar Center, LLC [7]	OR	2018	W7047												801					
	Bly Solar Center, LLC [7]	OR	2018	W7046												152					
	Elbe Solar Center, LLC [7]	OR	2018	W7044												769					
	Enterprise Solar, LLC [7]	UT	2016	W4938										22,516	57,800	58,722					
	Pavant Solar, LLC [7]	UT	2015	W4619										3,718	30,412	31,704					
	Pavant Solar II LLC	UT	2016	W5057	0	0	0	0	0	0	0	0	0	2,265	30,715	31,680					
	Sage Solar 1	WY	2019	W8800																	
	Sage Solar 2	WY	2019	W8808																	
	Sage Solar 3	WY	2019	W8811																	
	Sweetwater Solar	WY	2018	W7365																	
	Total Solar													**28,499**	**118,927**	**124,524**					
SOLAR CAPACITY STANDARD	Black Cap [5]	OR	2012	W3104	0	0	0	0	0	1,924	9,398	9,024	9,200	8,042	7,932	8,226					
	Total Utility Solar									**1,924**	**9,398**	**9,024**	**9,200**	**8,042**	**7,932**	**8,226**					
Total					**355,038**	**572,302**	**822,402**	**1,247,291**	**1,776,846**	**1,589,284**	**1,481,318**	**1,554,141**	**1,333,862**	**1,689,649**	**1,799,597**	**1,766,909**					

Oregon's Share Based on SG Allocation Factors[3]					**27.44%**	**28.19%**	**27.49%**	**26.20%**	**26.41%**	**25.93%**	**25.20%**	**25.51%**	**25.47%**	**25.57%**	**25.77%**	**26.06%**					

(1) Includes resources under development that are anticipated to receive certification by ODOE for the Oregon RPS as eligible under ORS 469A.025.
(2) COD means commercial operation date (year). For Oregon Solar Incentive Program Blocks, COD represents the first year in which capacity was added to the block/the block was established.
(3) Oregon share forecast and actual generation based on SG allocation factors.
(4) Includes contributions from incremental hydro
(5) Black Cap is eligible for 2x multiplier under ORS 757.375. Values here include multiplier.
(6) Resources categorized as "New Wyoming Wind" in 2017 RPIP.
(7) Resources treated as bundled up to Oregon's SG allocation, and unbundled up to its CAGW allocation.

Compliance Purchases Oregon RPS (MWh)	Transaction Date		Fuel	State	WREGIS ID	Commercial Operation Date	Price	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
[redacted]	1/25/2013							[redacted]																						
		[redacted]	Biogas	ID	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Biogas	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Biogas	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	1/25/2013							[redacted]																						
		[redacted]	Wind	CA	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	CA	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	2/6/2013							[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Hydroelectri	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Hydroelectri	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Hydroelectri	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Hydroelectri	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	2/11/2013							[redacted]																						
		[redacted]	Wind	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	2/6/2013							[redacted]																						
		[redacted]	Wind	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	WY	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	1/31/2013							[redacted]																						
		[redacted]	Biogas	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	2/4/2013							[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	2/4/2013							[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	6/28/2013							[redacted]																						
		[redacted]	Wind	NM	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	2/28/2013							[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	7/9/2013							[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	8/28/2013							[redacted]																						
		[redacted]	Wind	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	11/5/2013							[redacted]																						
		[redacted]	Wind	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	WA	[redacted]	[redacted]	[redacted]	[redacted]																						
[redacted]	8/10/2016							[redacted]																						
		[redacted]	Wind	CO	[redacted]	[redacted]	[redacted]	[redacted]																						
		[redacted]	Wind	CO	[redacted]		[redacted]	[redacted]																						
[redacted]								[redacted]																						
	8/18/2016	[redacted]	Solar	UT	[redacted]	[redacted]	[redacted]	[redacted]																						
								[redacted]																						
[redacted]	8/18/2016	[redacted]	Solar	UT	[redacted]	[redacted]	[redacted]	[redacted]																						
								[redacted]																						
[redacted]	9/2/2016	[redacted]	Solar	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
								[redacted]																						
[redacted]	9/2/2016	[redacted]	Solar	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
								[redacted]																						
[redacted]	9/2/2016	[redacted]	Solar	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
								[redacted]																						
[redacted]	9/2/2016	[redacted]	Solar	OR	[redacted]	[redacted]	[redacted]	[redacted]																						
Total								[redacted]																						

(7) Resources treated as bundled up to Oregon's SG allocation, and unbundled up to its CAGW allocation.

PacifiCorp
Renewable Portfolio Standard Oregon Implementation Plan 2021-2023

Confidential Attachment C

Preliminary Key Assumptions
Incremental Cost Calculation

(Redacted Version)

Confidential Attachment C
Protected Information
Subject to General Protective Order

PacifiCorp
Oregon Renewable Portfolio Standard
Implementation Plan
2021 through 2023

Key Assumptions – Expected Incremental Cost Calculation

Background

As part of its compliance with ORS 469A, PacifiCorp is required to file an implementation plan with the Public Utility Commission of Oregon (Commission), by January 1, 2020, that provides, among other things, a forecast of expected incremental costs of renewable resources in service during the 2021-2023 Oregon Renewable Portfolio Implementation Plan (2021-2023 RPIP) reporting period. The expected incremental cost calculation compares the cost of renewable resources to the cost of a proxy plant, a combined cycle combustion turbine (unless otherwise specified by the Commission). The annual expected incremental cost calculation for renewable resources in service during the 2021-2023 reporting period is the difference between the nominal levelized cost of the renewable resource and the nominal levelized cost of the proxy plants.

Order No. 17-010 in docket UM 1790 states that when PacifiCorp commences a resource procurement action for the purposes of complying with the Renewable Portfolio Standard (RPS) law that materially deviates from the filed integrated resource plan (IRP) or RPIP, it must calculate new incremental costs and respond to requests from the Commission regarding that analysis. On December 17, 2019, the Commission issued Order No. 19-447 granting a waiver of OAR 860-083-0400(2) through (5) with respect to the 2021-2023 RPIP. The waiver was granted to allow time for the Commission, staff, and parties to address various RPS-related issues in dockets AR 610, 616, 617, and 622. In accordance with the waiver, the incremental cost calculation for 2021-2023 RPIP focuses on major changes and new resources. Resources previously reported[1] are left largely unchanged.

The incremental cost calculations for new qualifying resources are aligned with PacifiCorp's 2019 IRP filed October 18, 2019 in docket LC 70 (2019 IRP). Qualifying resources previously reported are aligned with PacifiCorp's 2017 IRP filed on April 4, 2017 in docket LC 67 (2017 IRP) with the exception of 1,100 Megawatts (MW) of anticipated wind in Wyoming reported in PacifiCorp's 2017 RPIP. The 1,100 MW of anticipated wind in Wyoming served as a placeholder in the 2017 RPIP and is now replaced with specific resources in this 2019 report: Cedar Springs I, Cedar Springs II, Ekola Flats, and TB Flats I and II.

Methodology

The nominal levelized costs have been developed using an approach similar to that used to create the supply-side resource tables in Chapter 6 of the 2019 IRP. For qualifying renewable resources currently in service, forecasted ongoing capital, and operation and maintenance (O&M) are based on PacifiCorp's 2017 data. Actual ongoing capital and O&M values are used for the historical period of

[1] PacifiCorp's 2019-2023 RPIP (2017 RPIP) was filed with the Commission on December 28, 2017 in Docket No. UM 1914.

2007-2016. New resources' ongoing capital, and O&M forecasts are consistent with 2019 IRP assumptions.

Repowering
For repowered resources, the forecasted values for generation, capital, O&M and production tax credits (PTCs), starting in 2019 (2020 for Dunlap) are derived from the 2017 IRP with the exception of Goodnoe Hills. Goodnoe Hills repowering was introduced in the 2019 IRP and aligns with the 2019 IRP preferred portfolio assumptions.

The year when the resource is under construction is treated as a transition year with the following assumptions:

1. Generation is based on pre-repower forecast levels
2. Repowering capital is added to business plan forecasted capital
3. Fixed and variable O&M are held at pre-repower levels
4. PTCs are based on post-repowered generation (in service year)

The year following the transition year is considered the full in-service year where values reflect forecast for generation, capital, fixed and variable O&M and PTCs. Repowering will extend the life of the facility by 30 years and therefore the incremental costs are levelized over the extended period of 41 years (the remaining 11 years for the resource as originally put in-serve and the 30 year extension).

Power Purchase Agreement (PPA)
Data for renewable resources acquired through PPAs reflect the associated contract terms. Nominal levelized incremental cost was calculated by using an average $/MWh based on the incremental cost calculations for each resource, multiplied by anticipated generation. Six new PPA renewable resources were added in this year's filing: Cedar Springs I, Cedar Springs III, Sage Solar I, Sage Solar II, Sage Solar III, and Sweetwater.

The generation from Adams Solar, Bear Creek Solar, Bly Solar, Elby Solar, Enterprise Solar, and Pavant Solar, LLC is acquired through qualifying facility PPAs with non-renewable proxy pricing. PacifiCorp receives the renewable energy certifications (RECs) from these facilities under a supplemental REC-only agreement. The incremental cost analysis includes the normal levelized cost of the non-renewable contract price per megawatt-hour (MWh) plus the cost of the REC purchase based on the contracted price per REC for each resource. Generation for these PPAs is assumed to equal the number of forecasted bundled RECs.

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Proxy Plant
Nine new long-term qualifying renewable resources are contemplated in the 2021-2023 incremental cost analysis.

Five new qualifying renewable facilities or contracts—Cedar Springs III, Sage Solar I, Sage Solar II, Sage Solar II, and Sweetwater—use PacifiCorp's 2019 IRP East Side combined cycle combustion turbine (CCCT) Dry "J", Adv 1x1 at the Dave Johnston Brownfield location as the proxy plant.

Four new qualifying facilities or contracts—Cedar Springs I, Cedar Springs II, Ekola Flats and TB Flats—replace the previously reported 1,100 MW Wyoming Wind and use 2017 IRP proxy assigned to 1,100 MW Wyoming Wind placeholder in PacifiCorp's 2017 RPIP.

The proxy plant used in this analysis for the existing qualifying facilities continues to be a CCCT water-cooled "F" class 2x1 with duct firing at the Lake Side location from the 2008 IRP for the 2015-2019 filing; the CCCT Dry "J" class Adv 1x1 at the Dave Johnston Brownfield location, from PacifiCorp's 2015 IRP for the resources added during the 2017-2021 filing; and the CCCT Dry "J/HA.02", 1x1 at the Dave Johnston Brownfield location for East Side and the CCCT Dry "G/H", 1x1 at the Willamette Valley location from West Side for resources added during the 2019-2023 filing. The proxy plant's characteristics remain unchanged from those stated in the 2017 RPIP. .

The following official forward price curve (OFPC) scenarios[2] are considered in this incremental cost analysis:

- Scenario 1: September 28, 2018 OFPC IRP BASE
- Scenario 2: 2019 IRP OFPC Scenario High Gas High CO_2
- Scenario 3: 2019 IRP OFPC Scenario Low Gas Low CO_2
- Scenario 4: 2019 IRP OFPC Scenario Med Gas Med CO_2
- Scenario 5: 2019 IRP OFPC Scenario Med Gas SC CO_2
- Scenario 6: November 8, 2019 OFPC

Consistent with the discussion in Commission Order No. 09-299,[3] capital costs and O&M costs for the existing proxy plants based on 2008 IRP, 2015 IRP, and 2017 IRP remain unchanged from PacifiCorp's 2017 RPIP. Capital and O&M costs for the 2019 proxy plants are based on 2019 IRP. [4]

[2] Scenarios 1-5 are from the 2019 IRP Table 7.4 on page 182. *See* PacifiCorp's 2019 IRP at page 180 for details on carbon dioxide emission policy scenarios.
[3] *See* Docket No. AR 518, Order No. 09-299 (Aug. 3, 2009), at 4.
[4] See PacifiCorp's 2019 IRP – Volume I, Chapter 6, Tables 6.1 and 6.2.

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Consistent with the 2019 IRP, fuel price data is from PacifiCorp's November 2019 OFPC with natural gas delivered at the Lake Side, Dave Johnston Brownfield, and Willamette Valley locations.

The proxy plant CCCTs are sized to have an equal amount of annual energy output as the qualifying renewable resource. The proxy CCCT nameplate capacity is calculated as follows: *Proxy nameplate capacity = (RPS Resource nameplate capacity) X (RPS Resource capacity factor/Proxy CCCT capacity factor)* where the capacity factor of the proxy CCCT equals the capacity factor of a representative CCCT from the IRP.

Consistent with Order No. 12-272 issued in docket UM 1570 requiring inclusion of firming costs associated with qualifying renewable resources, the fixed cost of a simple cycle combustion turbine (SCCT) is added to the qualifying resource in order to create a capacity equivalent proxy resource for comparison to qualifying renewable resources supplying intermittent generation. The SCCT is sized to equal the difference between the respective capacity contribution of the proxy CCCT and the qualifying renewable resource. Incremental cost calculations do not include shaping costs consistent with Order No. 12-272.

Renewable Resources
Table 1 provides the qualifying renewable resources that are included in the expected incremental cost calculation in the 2021-2023 Plan.

Table 1 – List of Qualifying Resources Included in Incremental Cost

Resource (*Repowered Resources)	Assumed Capacity Factor (%)	In-Service Year	Capacity (MW)	Design Plant Life / Contract Term (Years)
Adams Solar QF		2016	10	10
Bear Creek Solar QF		2016	10	10
Black Cap Solar		2012	2	16
Blundell II		2007	12	26
Bly Solar QF		2016	8.5	10
Campbell Hill-Three Buttes		2009	99	20
Dunlap I *		2010	111	41
Elbe Solar QF		2016	10	10
Enterprise Solar QF		2016	80	21
Glenrock *		2009	99	41
Glenrock III *		2009	39	41
Goodnoe Hills *		2008	94	42

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High Plains *	2009	99	41
Latigo Wind Park QF	2015	39	20
Marengo *	2007	156	41
Marengo II *	2008	78	41
McFadden Ridge *	2009	28.5	41
Mountain Wind Power	2008	60.9	25
Mountain Wind Power II	2008	79.8	25
~~New 1100 MW WY Wind Proposal~~	~~2021~~	~~1100~~	~~30~~
Pavant II Solar QF	2016	50	20
Pavant Solar QF	2016	50	20
Pioneer Wind Park I QF	2016	79.8	20
Seven Mile Hill I *	2009	99	41
Seven Mile Hill II *	2009	19.5	41
Top of the World	2010	200.2	20
Oregon Solar Incentive Program 2010- 2017[5]	2010-2017	9.8	15
Cedar Springs I	2021	200	20
Cedar Springs II	2020	200	30
Cedar Springs III	2021	120	20
Ekola Flats	2020	250	30
TB Flats	2020	500	30
Sage Solar I	2019	20.0	20
Sage Solar II	2019	20.0	20
Sage Solar III	2019	17.6	20
Sweetwater	2018	80.0	20

In accordance with OAR 860-083-0100(1)(i), renewable resources that were in service before June 6, 2007, and low impact hydroelectric facilities have been excluded from the cost analysis. Hill Air Force Base, Leaning Juniper, Foote Creek II, and Foote Creek III are not included in the calculation, as these resources were in service before June 6, 2007. Additionally, the Rolling Hills facility is currently not included in Oregon rates and has been excluded from this cost analysis.[6]

Table 2 provides information relating to the PPAs, including nominal prices, which are based on contract terms. The nominal prices do not include the cost of integration, which is added as an adjustment in the levelized cost calculation. For PPA contracts with a REC purchase agreements, the

[5] To calculate the estimated incremental costs of the Oregon Solar Incentive Program (OSIP), capacity added to OSIP in each year was treated as an individual resource.
[6] *In the Matter of PacifiCorp, dba Pacific Power 2009 Renewable Adjustment Clause Schedule 202*, Docket No. UE 200, Order 548 at 19-20 (Nov. 14, 2008).

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nominal price does not include the price per REC, but the additional cost for the REC purchases is added as an adjustment in the levelized cost calculation.

Table 2 – Power Purchase Agreements (PPAs)

Resource	PPA Annual Nominal Levelized Contract Price ($/MWh)	REC Price	Contract Start Year	Average Capacity (MW)	Contract Term (Years)
Adams Solar QF (PPA) + RECs	[redacted]	[redacted]	2018	10	10
Bear Creek Solar QF (PPA) + RECs	[redacted]	[redacted]	2018	10	10
Bly Solar QF (PPA) + RECs	[redacted]	[redacted]	2018	8.5	10
Campbell Hill-Three Buttes (PPA)	[redacted]	[redacted]	2009	99	20
Cedar Springs I	[redacted]	[redacted]	2021	200	20
Cedar Springs III	[redacted]	[redacted]	2021	120	20
Elbe Solar QF (PPA) + RECs	[redacted]	[redacted]	2018	10	10
Enterprise Solar QF+ RECs	[redacted]	[redacted]	2016	80	21
Latigo Wind Park QF	[redacted]	[redacted]	2015	60	20
Mountain Wind Power (PPA)	[redacted]	[redacted]	2008	60.9	25
Mountain Wind Power II (PPA)	[redacted]	[redacted]	2008	79.8	25
Pavant Solar QF+ RECs	[redacted]	[redacted]	2016	50	20
Pavant II Solar QF	[redacted]	[redacted]	2016	50	20
Pioneer Wind	[redacted]	[redacted]	2016	80	20
Sage I	[redacted]	[redacted]	2019	20	20
Sage II	[redacted]	[redacted]	2019	20	20
Sage III	[redacted]	[redacted]	2019	17.6	20
Sweetwater	[redacted]	[redacted]	2018	80	20
Top of the World (PPA)	[redacted]	[redacted]	2010	200.2	20

Consistent with the 2019 IRP, a discount rate of 6.920 percent has been used in this expected incremental cost analysis. The associated payment factors have also been applied consistent with the 2019 IRP.

Inflation values are based on PacifiCorp's official inflation forecast. However, where a calculation requires a single value, the 2.2 percent average annual inflation rate from 2021-2050 was used. Otherwise, yearly values from PacifiCorp's official inflation forecast have been applied.

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PacifiCorp receives federal PTCs associated with owned wind projects excluding PPAs. Levelized PTC values for eligible resources have been adjusted to correspond to the in-service year of each resource. The assumption, consistent with the IRP, is an effective tax rate of 24.587 percent.

Capacity factors for existing renewable resources are based on the most current data available. Capacity factors for owned facilities and PPAs are calculated based on average generation over the life of facility or contract term and nameplate capacity. Generation values for 2007-2018 are actuals; generation values for 2019 include a combination of actual generation from January through May 2019 and forecasted values for June through December 2019. Generation values for years 2020 and beyond are forecasted.

The wind integration costs for calendar years (CY) 2007-2016 are from PacifiCorp's previously filed Oregon Transition Adjustment Mechanism (TAM) filings; except for 2014 which used 2014 Wind Integration Study in alignment with the 2015 IRP. Wind and solar integration values for 2020 and beyond are based on the 2019 Flexible Resource Study (2019 IRP Appendix F, Table F.2).

Peak Capacity Contribution values for qualifying facilities are derived from the values from the 2017 IRP.[7] PacifiCorp's 2019 IRP introduces a new method for calculating Peak Contribution. Until the Commission has an opportunity to weigh in on this approach, the RPIP will continue to use the last acknowledged IRP.

Payment factors for qualifying facilities are updated using the discount rate from the 2019 IRP.

Actual Bonneville Power Administration (BPA) costs for long-term and short-term point-to-point (PTP) transmission and scheduling charges have been included in the incremental cost calculation for Goodnoe Hills. Starting April 2013, Goodnoe Hills became part of PacifiCorp's control area, which resulted in the termination of BPA integration charges and the inclusion of PacifiCorp's integration cost going forward. The BPA wheeling costs going forward include only long-term PTP rates, and reflect the most recently effective BPA rates.

Transaction costs associated with fuel purchases are unchanged from the previous RPIP filing. Transaction costs are added to the proxy resource costs to comply with Order No. 12-272. Actual broker fees associated with forward gas purchases compared to total gas consumption by PacifiCorp's gas units for CY 2012-2016 are used to calculate an average annual historical gas transaction cost of $0.00003/MMBTU. Values for 2017 and beyond are estimated by applying annual inflation rates to the average annual historical gas transaction cost.

[7] See PacifiCorp's 2017 IRP – Volume II, Appendix N, Table N.1, p. 316.

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Levelized Calculation

The levelized calculation for each qualifying resource is based on the year that it is placed into service. Costs per MWh are escalated over the economic life of the resource. The annual cost per MWh is multiplied by the expected annual generation to develop the dollar cost in each year. Once the annual costs are calculated, the net present value of the costs (over the resource life) is calculated using a nominal discount rate, which is in turn used to calculate an annual nominal levelized value.

The proxy plant costs are similarly calculated with nominal levelized values aligned to the service years of each qualifying resource.

Some simplifying assumptions have been made, such as including a full year of generation for the qualifying resources' in-service year and rounding the economic life of a resource to a full year.

Expected Incremental Cost

The annual calculated nominal levelized cost of the proxy plant is subtracted from the annual calculated nominal levelized cost of each qualifying renewable resource. This difference is the annual incremental nominal levelized cost. The incremental nominal levelized cost is presented for each year of the 2019-2023 reporting period, and calculated for each of the fuel price scenarios identified in the proxy plant discussion above.

Allocation Factors

Table 3 provides the forecast Oregon system generation (SG) allocation factors using the October 2019 load forecast.

Table 3 – Allocation Factors

Year	SG Allocation Factor
2019	[redacted]
2020	
2021	
2022	
2023	

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Confidential Attachment D

Incremental Cost Analysis

(Redacted Version)

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PacifiCorp Oregon - 2021-2023 RPS Implementation Plan
2019 - 2023 Summary: RPS incremental costs

Scenario 1: Sept 28, 2018 OFPC IRP BASE Fuel Curve

	SYSTEM						2019 Oregon			2020 Oregon			2021 Oregon			2022 Oregon			2023 Oregon		
Resource	Levelized Cost of Qualifying Resource ($000)	Levelized Cost of Firming SCCT ($000)	Levelized Total Cost of Qualifying Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Incremental Cost ($/MWh)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)
Blundell II									-513.34			-512.88			-516.13			-517.75			-519.57
Campbell Hill-Three Buttes									1570.99			1569.57			1579.53			1584.48			1590.04
Dunlap I									-1322.78			-1321.59			-1329.98			-1334.14			-1338.83
Glenrock									-455.18			-454.77			-457.66			-459.09			-460.70
Glenrock III									-65.65			-65.60			-66.01			-66.22			-66.45
Goodnoe Hills									-458.81			-458.40			-461.31			-462.75			-464.38
High Plains									-41.57			-41.54			-41.80			-41.93			-42.08
McFadden Ridge									-293.39			-293.12			-294.98			-295.91			-296.95
Marengo									-721.35			-720.70			-725.27			-727.54			-730.10
Marengo II									-104.56			-104.47			-105.13			-105.46			-105.83
Mountain Wind Power									272.50			272.25			273.98			274.83			275.80
Mountain Wind Power II									870.04			869.25			874.77			877.51			880.59
Seven Mile Hill I									-1463.72			-1462.41			-1471.69			-1476.29			-1481.48
Seven Mile Hill II									-299.36			-299.09			-300.99			-301.93			-302.99
Top of the World									3261.13			3258.20			3278.87			3289.14			3300.70
Pioneer Wind Park I QF									-494.88			-494.43			-497.57			-499.13			-500.88
Latigo Wind Park QF									735.39			734.73			739.39			741.70			744.31
Pavant II Solar QF									-243.19			-242.97			-244.51			-245.28			-246.14
Black Cap Solar									113.25			113.25			113.25			113.25			113.25
Adams Solar QF									200.11			199.93			201.20			201.83			202.54
Bear Creek Solar QF									221.73			221.53			222.93			223.63			224.42
Bly Solar QF									180.49			180.33			181.48			182.04			182.68
Elbe Solar QF									212.98			212.79			214.14			214.81			215.57
Enterprise Solar QF									-994.47			-993.58			-999.88			-1003.01			-1006.53
Pavant Solar QF									-826.93			-826.18			-831.42			-834.03			-836.96
OSIP_2010									131.47			131.47			131.47			131.47			131.47
OSIP_2011									1270.67			1270.67			1270.67			1270.67			1270.67
OSIP_2012									816.37			816.37			816.37			816.37			816.37
OSIP_2013									966.54			966.54			966.54			966.54			966.54
OSIP_2014									620.92			620.92			620.92			620.92			620.92
OSIP_2015									233.55			233.55			233.55			233.55			233.55
OSIP_2016									108.91			108.91			108.91			108.91			108.91
OSIP_2017									28.38			28.38			28.38			28.38			28.38
Cedar Springs I									-5047.91			-5043.37			-5075.37			-5091.25			-5109.15
Cedar Springs II									-7481.96			-7475.23			-7522.66			-7546.20			-7572.72
Cedar Springs III									-9051.37			-9043.22			-9100.60			-9129.09			-9161.17
Ekola Flats									-3705.12			-3701.78			-3725.27			-3736.93			-3750.06
TB Flats									-7084.38			-7078.01			-7122.92			-7145.21			-7170.32
Sage Solar I									-636.74			-636.16			-640.20			-642.20			-644.46
Sage Solar II									-636.16			-635.59			-639.62			-641.62			-643.88
Sage Solar III									-528.77			-528.30			-531.65			-533.31			-535.19
Sweetwater									-2593.30			-2590.96			-2607.40			-2615.56			-2624.76

Scenario 2: 2019 IPR OFPC Scenario High Gas High CO2 Fuel Curve

	SYSTEM						2019 Oregon			2020 Oregon			2021 Oregon			2022 Oregon			2023 Oregon		
Resource	Levelized Cost of Qualifying Resource ($000)	Levelized Cost of Firming SCCT ($000)	Levelized Total Cost of Qualifying Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Incremental Cost ($/MWh)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)
Blundell II																					
Campbell Hill-Three Buttes																					
Dunlap I																					
Glenrock																					
Glenrock III																					
Goodnoe Hills																					
High Plains																					
McFadden Ridge																					
Marengo																					
Marengo II																					
Mountain Wind Power																					
Mountain Wind Power II																					
Seven Mile Hill I																					
Seven Mile Hill II																					
Top of the World																					
Pioneer Wind Park I QF																					
Latigo Wind Park QF																					
Pavant II Solar QF																					
Black Cap Solar																					
Adams Solar QF																					
Bear Creek Solar QF																					
Bly Solar QF																					
Elbe Solar QF																					
Enterprise Solar QF																					
Pavant Solar QF																					
OSIP_2010																					
OSIP_2011																					
OSIP_2012																					
OSIP_2013																					
OSIP_2014																					
OSIP_2015																					
OSIP_2016																					
OSIP_2017																					
Cedar Springs I																					
Cedar Springs II																					
Cedar Springs III																					
Ekola Flats																					
TB Flats																					
Sage Solar I																					
Sage Solar II																					
Sage Solar III																					
Sweetwater																					

Scenario 3: 2019 IPR OFPC Scenario Low Gas Low CO2 Fuel Curve

	SYSTEM						2019 Oregon			2020 Oregon			2021 Oregon			2022 Oregon			2023 Oregon		
Resource	Levelized Cost of Qualifying Resource ($000)	Levelized Cost of Firming SCCT ($000)	Levelized Total Cost of Qualifying Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Incremental Cost ($/MWh)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)
Blundell II	[redacted]																				
Campbell Hill-Three Buttes																					
Dunlap I																					
Glenrock																					
Glenrock III																					
Goodnoe Hills																					
High Plains																					
McFadden Ridge																					
Marengo																					
Marengo II																					
Mountain Wind Power																					
Mountain Wind Power II																					
Seven Mile Hill I																					
Seven Mile Hill II																					
Top of the World																					
Pioneer Wind Park I QF																					
Latigo Wind Park QF																					
Pavant II Solar QF																					
Black Cap Solar																					
Adams Solar QF																					
Bear Creek Solar QF																					
Bly Solar QF																					
Elbe Solar QF																					
Enterprise Solar QF																					
Pavant Solar QF																					
OSIP_2010																					
OSIP_2011																					
OSIP_2012																					
OSIP_2013																					
OSIP_2014																					
OSIP_2015																					
OSIP_2016																					
OSIP_2017																					
Cedar Springs I																					
Cedar Springs II																					
Cedar Springs III																					
Ekola Flats																					
TB Flats																					
Sage Solar I																					
Sage Solar II																					
Sage Solar III																					
Sweetwater																					

Scenario 4: 2019 IPR OFPC Scenario Med Gas Med CO2 Fuel Curve

	SYSTEM						2019 Oregon			2020 Oregon			2021 Oregon			2022 Oregon			2023 Oregon		
Resource	Levelized Cost of Qualifying Resource ($000)	Levelized Cost of Firming SCCT ($000)	Levelized Total Cost of Qualifying Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Incremental Cost ($/MWh)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)	Levelized Cost of Resource ($000)	Levelized Cost of CCCT Proxy ($000)	Levelized Incremental Cost ($000)
Blundell II	[redacted]																				
Campbell Hill-Three Buttes																					
Dunlap I																					
Glenrock																					
Glenrock III																					
Goodnoe Hills																					
High Plains																					
McFadden Ridge																					
Marengo																					
Marengo II																					
Mountain Wind Power																					
Mountain Wind Power II																					
Seven Mile Hill I																					
Seven Mile Hill II																					
Top of the World																					
Pioneer Wind Park I QF																					
Latigo Wind Park QF																					
Pavant II Solar QF																					
Black Cap Solar																					
Adams Solar QF																					
Bear Creek Solar QF																					
Bly Solar QF																					
Elbe Solar QF																					
Enterprise Solar QF																					
Pavant Solar QF																					
OSIP_2010																					
OSIP_2011																					
OSIP_2012																					
OSIP_2013																					
OSIP_2014																					
OSIP_2015																					
OSIP_2016																					
OSIP_2017																					
Cedar Springs I																					
Cedar Springs II																					
Cedar Springs III																					
Ekola Flats																					
TB Flats																					
Sage Solar I																					
Sage Solar II																					
Sage Solar III																					
Sweetwater																					

Scenario 5: 2019 IPR OFPC Scenario Med Gas SC CO2 Fuel Curve

Resource	SYSTEM Levelized Cost of Qualifying Resource ($000)	SYSTEM Levelized Cost of Firming SCCT ($000)	SYSTEM Levelized Total Cost of Qualifying Resource ($000)	SYSTEM Levelized Cost of CCCT Proxy ($000)	SYSTEM Levelized Incremental Cost ($000)	SYSTEM Levelized Incremental Cost ($/MWh)	2019 Oregon Levelized Cost of Resource ($000)	2019 Oregon Levelized Cost of CCCT Proxy ($000)	2019 Oregon Levelized Incremental Cost ($000)	2020 Oregon Levelized Cost of Resource ($000)	2020 Oregon Levelized Cost of CCCT Proxy ($000)	2020 Oregon Levelized Incremental Cost ($000)	2021 Oregon Levelized Cost of Resource ($000)	2021 Oregon Levelized Cost of CCCT Proxy ($000)	2021 Oregon Levelized Incremental Cost ($000)	2022 Oregon Levelized Cost of Resource ($000)	2022 Oregon Levelized Cost of CCCT Proxy ($000)	2022 Oregon Levelized Incremental Cost ($000)	2023 Oregon Levelized Cost of Resource ($000)	2023 Oregon Levelized Cost of CCCT Proxy ($000)	2023 Oregon Levelized Incremental Cost ($000)
Blundell II	[redacted]																					
Campbell Hill-Three Buttes																						
Dunlap I																						
Glenrock																						
Glenrock III																						
Goodnoe Hills																						
High Plains																						
McFadden Ridge																						
Marengo																						
Marengo II																						
Mountain Wind Power																						
Mountain Wind Power II																						
Seven Mile Hill I																						
Seven Mile Hill II																						
Top of the World																						
Pioneer Wind Park I QF																						
Latigo Wind Park QF																						
Pavant II Solar QF																						
Black Cap Solar																						
Adams Solar QF																						
Bear Creek Solar QF																						
Bly Solar QF																						
Elbe Solar QF																						
Enterprise Solar QF																						
Pavant Solar QF																						
OSIP_2010																						
OSIP_2011																						
OSIP_2012																						
OSIP_2013																						
OSIP_2014																						
OSIP_2015																						
OSIP_2016																						
OSIP_2017																						
Cedar Springs I																						
Cedar Springs II																						
Cedar Springs III																						
Ekola Flats																						
TB Flats																						
Sage Solar I																						
Sage Solar II																						
Sage Solar III																						
Sweetwater																						

Scenario 6: Nov 8, 2019 OFPC Fuel Curve

Resource	SYSTEM Levelized Cost of Qualifying Resource ($000)	SYSTEM Levelized Cost of Firming SCCT ($000)	SYSTEM Levelized Total Cost of Qualifying Resource ($000)	SYSTEM Levelized Cost of CCCT Proxy ($000)	SYSTEM Levelized Incremental Cost ($000)	SYSTEM Levelized Incremental Cost ($/MWh)	2019 Oregon Levelized Cost of Resource ($000)	2019 Oregon Levelized Cost of CCCT Proxy ($000)	2019 Oregon Levelized Incremental Cost ($000)	2020 Oregon Levelized Cost of Resource ($000)	2020 Oregon Levelized Cost of CCCT Proxy ($000)	2020 Oregon Levelized Incremental Cost ($000)	2021 Oregon Levelized Cost of Resource ($000)	2021 Oregon Levelized Cost of CCCT Proxy ($000)	2021 Oregon Levelized Incremental Cost ($000)	2022 Oregon Levelized Cost of Resource ($000)	2022 Oregon Levelized Cost of CCCT Proxy ($000)	2022 Oregon Levelized Incremental Cost ($000)	2023 Oregon Levelized Cost of Resource ($000)	2023 Oregon Levelized Cost of CCCT Proxy ($000)	2023 Oregon Levelized Incremental Cost ($000)
Blundell II	[redacted]				-487.19				-486.75			-489.84			-491.37			-493.10			
Campbell Hill-Three Buttes					1646.74				1645.26			1655.70			1660.88			1666.72			
Dunlap I					-1043.52				-1042.58			-1049.19			-1052.48			-1056.18			
Glenrock					-251.17				-250.95			-252.54			-253.33			-254.22			
Glenrock III					13.63				13.61			13.70			13.74			13.79			
Goodnoe Hills					-378.65				-378.31			-380.71			-381.90			-383.24			
High Plains					177.27				177.11			178.24			178.79			179.42			
McFadden Ridge					-231.29				-231.08			-232.55			-233.28			-234.10			
Marengo					-487.42				-486.98			-490.07			-491.61			-493.33			
Marengo II					17.27				17.25			17.36			17.42			17.48			
Mountain Wind Power					319.22				318.94			320.96			321.96			323.09			
Mountain Wind Power II					933.30				932.46			938.37			941.31			944.62			
Seven Mile Hill I					-1234.86				-1233.75			-1241.58			-1245.46			-1249.84			
Seven Mile Hill II					-255.00				-254.77			-256.38			-257.19			-258.09			
Top of the World					3435.14				3432.05			3453.82			3464.63			3476.81			
Pioneer Wind Park I QF					-494.88				-494.43			-497.57			-499.13			-500.88			
Latigo Wind Park QF					735.39				734.73			739.39			741.70			744.31			
Pavant II Solar QF					-243.19				-242.97			-244.51			-245.28			-246.14			
Black Cap Solar					113.25				113.25			113.25			113.25			113.25			
Adams Solar QF					198.22				198.04			199.30			199.92			200.62			
Bear Creek Solar QF					219.76				219.56			220.95			221.64			222.42			
Bly Solar QF					178.78				178.62			179.76			180.32			180.95			
Elbe Solar QF					211.09				210.90			212.24			212.91			213.65			
Enterprise Solar QF					-994.47				-993.58			-999.88			-1003.01			-1006.53			
Pavant Solar QF					-826.93				-826.18			-831.42			-834.03			-836.96			
OSIP_2010					131.47				131.47			131.47			131.47			131.47			
OSIP_2011					1270.67				1270.67			1270.67			1270.67			1270.67			
OSIP_2012					816.37				816.37			816.37			816.37			816.37			
OSIP_2013					966.54				966.54			966.54			966.54			966.54			
OSIP_2014					620.92				620.92			620.92			620.92			620.92			
OSIP_2015					233.55				233.55			233.55			233.55			233.55			
OSIP_2016					108.91				108.91			108.91			108.91			108.91			
OSIP_2017					28.38				28.38			28.38			28.38			28.38			
Cedar Springs I					-4254.19				-4250.36			-4277.33			-4290.72			-4305.80			
Cedar Springs II					-6658.65				-6652.66			-6694.86			-6715.82			-6739.42			
Cedar Springs III					-8515.38				-8507.72			-8561.70			-8588.50			-8618.68			
Ekola Flats					-2809.17				-2806.65			-2824.45			-2833.30			-2843.25			
TB Flats					-5248.92				-5244.20			-5277.47			-5293.99			-5312.59			
Sage Solar I					-598.89				-598.35			-602.15			-604.03			-606.15			
Sage Solar II					-598.31				-597.78			-601.57			-603.45			-605.57			
Sage Solar III					-497.39				-496.94			-500.09			-501.66			-503.42			
Sweetwater					-2510.25				-2508.00			-2523.91			-2531.81			-2540.71			

PacifiCorp
Renewable Portfolio Standard Oregon Implementation Plan 2019-2023

Attachment E

Scenarios 1-6

Summary of Incremental Cost by Resource

PacifiCorp - Oregon 2021-2023 RPS Implementation Plan
Attachment E - Summary of RPS Incremental Costs by Resource

Scenario 1: Sept 28, 2018 OFPC IRP BASE Fuel Curve

Resource	2019 Levelized Incremental Cost ($000)	2020 Levelized Incremental Cost ($000)	2021 Levelized Incremental Cost ($000)	2022 Levelized Incremental Cost ($000)	2023 Levelized Incremental Cost ($000)
Latigo Wind Park QF	$735	$735	$739	$742	$744
Pavant II Solar QF	($243)	($243)	($245)	($245)	($246)
Black Cap Solar	$113	$113	$113	$113	$113
Adams Solar QF	$200	$200	$201	$202	$203
Bear Creek Solar QF	$222	$222	$223	$224	$224
Bly Solar QF	$180	$180	$181	$182	$183
Elbe Solar QF	$213	$213	$214	$215	$216
Enterprise Solar QF	($994)	($994)	($1,000)	($1,003)	($1,007)
Pavant Solar QF	($827)	($826)	($831)	($834)	($837)
OSIP_2010	$131	$131	$131	$131	$131
OSIP_2011	$1,271	$1,271	$1,271	$1,271	$1,271
OSIP_2012	$816	$816	$816	$816	$816
OSIP_2013	$967	$967	$967	$967	$967
OSIP_2014	$621	$621	$621	$621	$621
OSIP_2015	$234	$234	$234	$234	$234
OSIP_2016	$109	$109	$109	$109	$109
OSIP_2017	$28	$28	$28	$28	$28
Cedar Springs I	($5,048)	($5,043)	($5,075)	($5,091)	($5,109)
Cedar Springs II	($7,482)	($7,475)	($7,523)	($7,546)	($7,573)
Cedar Springs III	($9,051)	($9,043)	($9,101)	($9,129)	($9,161)
Ekola Flats	($3,705)	($3,702)	($3,725)	($3,737)	($3,750)
TB Flats	($7,084)	($7,078)	($7,123)	($7,145)	($7,170)
Sage Solar I	($637)	($636)	($640)	($642)	($644)
Sage Solar II	($636)	($636)	($640)	($642)	($644)
Sage Solar III	($529)	($528)	($532)	($533)	($535)
Sweetwater Solar	($2,593)	($2,591)	($2,607)	($2,616)	($2,625)

Scenario 2: 2019 IPR OFPC Scenario High Gas High CO2 Fuel Curve

Resource	2019 Levelized Incremental Cost ($000)	2020 Levelized Incremental Cost ($000)	2021 Levelized Incremental Cost ($000)	2022 Levelized Incremental Cost ($000)	2023 Levelized Incremental Cost ($000)
Blundell II	($612)	($611)	($615)	($617)	($619)
Campbell Hill-Three Buttes	$1,175	$1,174	$1,181	$1,185	$1,189
Dunlap I	($2,262)	($2,260)	($2,275)	($2,282)	($2,290)
Glenrock	($1,157)	($1,156)	($1,163)	($1,167)	($1,171)
Glenrock III	($337)	($337)	($339)	($340)	($341)
Goodnoe Hills	($796)	($796)	($801)	($803)	($806)
High Plains	($787)	($786)	($791)	($794)	($797)
McFadden Ridge	($507)	($507)	($510)	($511)	($513)
Marengo	($1,507)	($1,506)	($1,516)	($1,520)	($1,526)
Marengo II	($512)	($511)	($514)	($516)	($518)
Mountain Wind Power	$55	$55	$55	$55	$56
Mountain Wind Power II	$577	$577	$580	$582	$584
Seven Mile Hill I	($2,257)	($2,255)	($2,269)	($2,276)	($2,284)
Seven Mile Hill II	($454)	($454)	($457)	($458)	($460)
Top of the World	$2,378	$2,376	$2,391	$2,398	$2,407
Pioneer Wind Park I QF	($495)	($494)	($498)	($499)	($501)
Latigo Wind Park QF	$735	$735	$739	$742	$744
Pavant II Solar QF	($243)	($243)	($245)	($245)	($246)
Black Cap Solar	$113	$113	$113	$113	$113
Adams Solar QF	$167	$167	$168	$169	$169
Bear Creek Solar QF	$188	$188	$189	$189	$190
Bly Solar QF	$151	$151	$152	$152	$153
Elbe Solar QF	$180	$180	$181	$182	$183
Enterprise Solar QF	($994)	($994)	($1,000)	($1,003)	($1,007)
Pavant Solar QF	($827)	($826)	($831)	($834)	($837)
OSIP_2010	$131	$131	$131	$131	$131
OSIP_2011	$1,271	$1,271	$1,271	$1,271	$1,271
OSIP_2012	$816	$816	$816	$816	$816
OSIP_2013	$967	$967	$967	$967	$967
OSIP_2014	$621	$621	$621	$621	$621
OSIP_2015	$234	$234	$234	$234	$234
OSIP_2016	$109	$109	$109	$109	$109

OSIP_2017	$28	$28	$28	$28	$28
Cedar Springs I	($6,674)	($6,668)	($6,711)	($6,732)	($6,755)
Cedar Springs II	($9,155)	($9,147)	($9,205)	($9,234)	($9,266)
Cedar Springs III	($10,150)	($10,141)	($10,205)	($10,237)	($10,273)
Ekola Flats	($5,548)	($5,543)	($5,578)	($5,595)	($5,615)
TB Flats	($10,859)	($10,850)	($10,919)	($10,953)	($10,991)
Sage Solar I	($730)	($729)	($734)	($736)	($739)
Sage Solar II	($729)	($728)	($733)	($735)	($738)
Sage Solar III	($606)	($605)	($609)	($611)	($613)
Sweetwater Solar	($2,936)	($2,933)	($2,952)	($2,961)	($2,972)

Scenario 3: 2019 IPR OFPC Scenario Low Gas Low CO2 Fuel Curve

	2019	2020	2021	2022	2023
Resource	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**
Blundell II	($467)	($467)	($470)	($471)	($473)
Campbell Hill-Three Buttes	$1,701	$1,700	$1,710	$1,716	$1,722
Dunlap I	($696)	($696)	($700)	($702)	($705)
Glenrock	$2	$2	$2	$2	$2
Glenrock III	$111	$111	$112	$112	$113
Goodnoe Hills	($309)	($308)	($310)	($311)	($312)
High Plains	$447	$447	$450	$451	$453
McFadden Ridge	($154)	($154)	($155)	($155)	($156)
Marengo	($210)	($209)	($211)	($211)	($212)
Marengo II	$163	$163	$164	$164	$165
Mountain Wind Power	$367	$366	$369	$370	$371
Mountain Wind Power II	$997	$996	$1,002	$1,006	$1,009
Seven Mile Hill I	($948)	($947)	($953)	($956)	($959)
Seven Mile Hill II	($199)	($199)	($200)	($201)	($201)
Top of the World	$3,571	$3,568	$3,591	$3,602	$3,615
Pioneer Wind Park I QF	($495)	($494)	($498)	($499)	($501)
Latigo Wind Park QF	$735	$735	$739	$742	$744
Pavant II Solar QF	($243)	($243)	($245)	($245)	($246)
Black Cap Solar	$113	$113	$113	$113	$113
Adams Solar QF	$219	$219	$220	$221	$222
Bear Creek Solar QF	$242	$241	$243	$244	$245
Bly Solar QF	$198	$198	$199	$200	$200
Elbe Solar QF	$232	$232	$233	$234	$235
Enterprise Solar QF	($994)	($994)	($1,000)	($1,003)	($1,007)
Pavant Solar QF	($827)	($826)	($831)	($834)	($837)
OSIP_2010	$131	$131	$131	$131	$131
OSIP_2011	$1,271	$1,271	$1,271	$1,271	$1,271
OSIP_2012	$816	$816	$816	$816	$816
OSIP_2013	$967	$967	$967	$967	$967
OSIP_2014	$621	$621	$621	$621	$621
OSIP_2015	$234	$234	$234	$234	$234
OSIP_2016	$109	$109	$109	$109	$109
OSIP_2017	$28	$28	$28	$28	$28
Cedar Springs I	($3,198)	($3,195)	($3,215)	($3,225)	($3,237)
Cedar Springs II	($5,437)	($5,432)	($5,467)	($5,484)	($5,503)
Cedar Springs III	($7,802)	($7,795)	($7,845)	($7,869)	($7,897)
Ekola Flats	($1,470)	($1,468)	($1,478)	($1,482)	($1,488)
TB Flats	($2,505)	($2,503)	($2,518)	($2,526)	($2,535)
Sage Solar I	($542)	($542)	($545)	($547)	($549)
Sage Solar II	($542)	($541)	($545)	($546)	($548)
Sage Solar III	($450)	($450)	($453)	($454)	($456)
Sweetwater Solar	($2,266)	($2,264)	($2,278)	($2,286)	($2,294)

Scenario 4: 2019 IPR OFPC Scenario Med Gas Med CO2 Fuel Curve

	2019	2020	2021	2022	2023
Resource	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**
Blundell II	($513)	($513)	($516)	($518)	($520)
Campbell Hill-Three Buttes	$1,571	$1,570	$1,580	$1,584	$1,590
Dunlap I	($1,323)	($1,322)	($1,330)	($1,334)	($1,339)
Glenrock	($455)	($455)	($458)	($459)	($461)
Glenrock III	($66)	($66)	($66)	($66)	($66)
Goodnoe Hills	($459)	($458)	($461)	($463)	($464)
High Plains	($42)	($42)	($42)	($42)	($42)
McFadden Ridge	($293)	($293)	($295)	($296)	($297)
Marengo	($721)	($721)	($725)	($728)	($730)
Marengo II	($105)	($104)	($105)	($105)	($106)

Mountain Wind Power	$272	$272	$274	$275	$276
Mountain Wind Power II	$870	$869	$875	$878	$881
Seven Mile Hill I	($1,464)	($1,462)	($1,472)	($1,476)	($1,481)
Seven Mile Hill II	($299)	($299)	($301)	($302)	($303)
Top of the World	$3,261	$3,258	$3,279	$3,289	$3,301
Pioneer Wind Park I QF	($495)	($494)	($498)	($499)	($501)
Latigo Wind Park QF	$735	$735	$739	$742	$744
Pavant II Solar QF	($243)	($243)	($245)	($245)	($246)
Black Cap Solar	$113	$113	$113	$113	$113
Adams Solar QF	$200	$200	$201	$202	$203
Bear Creek Solar QF	$222	$222	$223	$224	$224
Bly Solar QF	$180	$180	$181	$182	$183
Elbe Solar QF	$213	$213	$214	$215	$216
Enterprise Solar QF	($994)	($994)	($1,000)	($1,003)	($1,007)
Pavant Solar QF	($827)	($826)	($831)	($834)	($837)
OSIP_2010	$131	$131	$131	$131	$131
OSIP_2011	$1,271	$1,271	$1,271	$1,271	$1,271
OSIP_2012	$816	$816	$816	$816	$816
OSIP_2013	$967	$967	$967	$967	$967
OSIP_2014	$621	$621	$621	$621	$621
OSIP_2015	$234	$234	$234	$234	$234
OSIP_2016	$109	$109	$109	$109	$109
OSIP_2017	$28	$28	$28	$28	$28
Cedar Springs I	($5,048)	($5,043)	($5,075)	($5,091)	($5,109)
Cedar Springs II	($7,482)	($7,475)	($7,523)	($7,546)	($7,573)
Cedar Springs III	($9,051)	($9,043)	($9,101)	($9,129)	($9,161)
Ekola Flats	($3,705)	($3,702)	($3,725)	($3,737)	($3,750)
TB Flats	($7,084)	($7,078)	($7,123)	($7,145)	($7,170)
Sage Solar I	($637)	($636)	($640)	($642)	($644)
Sage Solar II	($636)	($636)	($640)	($642)	($644)
Sage Solar III	($529)	($528)	($532)	($533)	($535)
Sweetwater Solar	($2,593)	($2,591)	($2,607)	($2,616)	($2,625)

Scenario 5: 2019 IPR OFPC Scenario Med Gas SC CO2 Fuel Curve

	2019	2020	2021	2022	2023
Resource	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**
Blundell II	-513.34	-512.88	-516.13	-517.75	-519.57
Campbell Hill-Three Buttes	1570.99	1569.57	1579.53	1584.48	1590.04
Dunlap I	-1322.78	-1321.59	-1329.98	-1334.14	-1338.83
Glenrock	-455.18	-454.77	-457.66	-459.09	-460.70
Glenrock III	-65.65	-65.60	-66.01	-66.22	-66.45
Goodnoe Hills	-458.81	-458.40	-461.31	-462.75	-464.38
High Plains	-41.57	-41.54	-41.80	-41.93	-42.08
McFadden Ridge	-293.39	-293.12	-294.98	-295.91	-296.95
Marengo	-721.35	-720.70	-725.27	-727.54	-730.10
Marengo II	-104.56	-104.47	-105.13	-105.46	-105.83
Mountain Wind Power	272.50	272.25	273.98	274.83	275.80
Mountain Wind Power II	870.04	869.25	874.77	877.51	880.59
Seven Mile Hill I	-1463.72	-1462.41	-1471.69	-1476.29	-1481.48
Seven Mile Hill II	-299.36	-299.09	-300.99	-301.93	-302.99
Top of the World	3261.13	3258.20	3278.87	3289.14	3300.70
Pioneer Wind Park I QF	-494.88	-494.43	-497.57	-499.13	-500.88
Latigo Wind Park QF	735.39	734.73	739.39	741.70	744.31
Pavant II Solar QF	-243.19	-242.97	-244.51	-245.28	-246.14
Black Cap Solar	113.25	113.25	113.25	113.25	113.25
Adams Solar QF	200.11	199.93	201.20	201.83	202.54
Bear Creek Solar QF	221.73	221.53	222.93	223.63	224.42
Bly Solar QF	180.49	180.33	181.48	182.04	182.68
Elbe Solar QF	212.98	212.79	214.14	214.81	215.57
Enterprise Solar QF	-994.47	-993.58	-999.88	-1003.01	-1006.53
Pavant Solar QF	-826.93	-826.18	-831.42	-834.03	-836.96
OSIP_2010	$131	$131	$131	$131	$131
OSIP_2011	$1,271	$1,271	$1,271	$1,271	$1,271
OSIP_2012	$816	$816	$816	$816	$816
OSIP_2013	$967	$967	$967	$967	$967
OSIP_2014	$621	$621	$621	$621	$621
OSIP_2015	$234	$234	$234	$234	$234
OSIP_2016	$109	$109	$109	$109	$109
OSIP_2017	$28	$28	$28	$28	$28
Cedar Springs I	($5,048)	($5,043)	($5,075)	($5,091)	($5,109)
Cedar Springs II	($7,482)	($7,475)	($7,523)	($7,546)	($7,573)
Cedar Springs III	($9,051)	($9,043)	($9,101)	($9,129)	($9,161)
Ekola Flats	($3,705)	($3,702)	($3,725)	($3,737)	($3,750)
TB Flats	($7,084)	($7,078)	($7,123)	($7,145)	($7,170)
Sage Solar I	($637)	($636)	($640)	($642)	($644)
Sage Solar II	($636)	($636)	($640)	($642)	($644)
Sage Solar III	($529)	($528)	($532)	($533)	($535)

Sweetwater Solar	($2,593)	($2,591)	($2,607)	($2,616)	($2,625)

Scenario 6: Nov 8, 2019 OFPC Fuel Curve

	2019	2020	2021	2022		2023
Resource	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**	**Levelized Incremental Cost ($000)**		**Levelized Incremental Cost ($000)**
Blundell II	($487)	-486.75	-489.84	-491.37	#	-493.10
Campbell Hill-Three Buttes	$1,647	1645.26	1655.70	1660.88	#	1666.72
Dunlap I	($1,044)	-1042.58	-1049.19	-1052.48	#	-1056.18
Glenrock	($251)	-250.95	-252.54	-253.33	#	-254.22
Glenrock III	$14	13.61	13.70	13.74	#	13.79
Goodnoe Hills	($379)	-378.31	-380.71	-381.90	#	-383.24
High Plains	$177	177.11	178.24	178.79	#	179.42
McFadden Ridge	($231)	-231.08	-232.55	-233.28	#	-234.10
Marengo	($487)	-486.98	-490.07	-491.61	#	-493.33
Marengo II	$17	17.25	17.36	17.42	#	17.48
Mountain Wind Power	$319	318.94	320.96	321.96	#	323.09
Mountain Wind Power II	$933	932.46	938.37	941.31	#	944.62
Seven Mile Hill I	($1,235)	-1233.75	-1241.58	-1245.46	#	-1249.84
Seven Mile Hill II	($255)	-254.77	-256.38	-257.19	#	-258.09
Top of the World	$3,435	3432.05	3453.82	3464.63	#	3476.81
Pioneer Wind Park I QF	($495)	-494.43	-497.57	-499.13	#	-500.88
Latigo Wind Park QF	$735	734.73	739.39	741.70	#	744.31
Pavant II Solar QF	($243)	-242.97	-244.51	-245.28	#	-246.14
Black Cap Solar	$113	113.25	113.25	113.25	#	113.25
Adams Solar QF	$198	198.04	199.30	199.92	#	200.62
Bear Creek Solar QF	$220	219.56	220.95	221.64	#	222.42
Bly Solar QF	$179	178.62	179.76	180.32	#	180.95
Elbe Solar QF	$211	210.90	212.24	212.91	#	213.65
Enterprise Solar QF	($994)	-993.58	-999.88	-1003.01	#	-1006.53
Pavant Solar QF	($827)	-826.18	-831.42	-834.03	#	-836.96
OSIP_2010	$131	$131	$131	$131	0	$131
OSIP_2011	$1,271	$1,271	$1,271	$1,271	0	$1,271
OSIP_2012	$816	$816	$816	$816	0	$816
OSIP_2013	$967	$967	$967	$967	0	$967
OSIP_2014	$621	$621	$621	$621	0	$621
OSIP_2015	$234	$234	$234	$234	0	$234
OSIP_2016	$109	$109	$109	$109	0	$109
OSIP_2017	$28	$28	$28	$28	0	$28
Cedar Springs I	($4,254)	($4,250)	($4,277)	($4,291)	0	($4,306)
Cedar Springs II	($6,659)	($6,653)	($6,695)	($6,716)	0	($6,739)
Cedar Springs III	($8,515)	($8,508)	($8,562)	($8,588)	0	($8,619)
Ekola Flats	($2,809)	($2,807)	($2,824)	($2,833)	0	($2,843)
TB Flats	($5,249)	($5,244)	($5,277)	($5,294)	0	($5,313)
Sage Solar I	($599)	($598)	($602)	($604)	0	($606)
Sage Solar II	($598)	($598)	($602)	($603)	0	($606)
Sage Solar III	($497)	($497)	($500)	($502)		($503)
Sweetwater Solar	($2,510)	($2,508)	($2,524)	($2,532)		($2,541)