



825 NE Multnomah, Suite 2000  
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December 28, 2017

***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 1914 – PacifiCorp’s Renewable Portfolio Standard Implementation Plan  
2019-2023**

PacifiCorp d/b/a Pacific Power encloses for filing its Oregon Renewable Portfolio Standard (RPS) Implementation Plan, for the compliance years 2019-2023, in compliance with ORS 469A.075 and OAR 860-083-0400. This filing includes confidential and public versions of the RPS Implementation Plan attachments. In addition, enclosed is a compact disk containing confidential work papers associated with this filing. Confidential material in support of this filing is provided under Order No. 17-523.

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

By e-mail (preferred): [datarequest@pacificorp.com](mailto: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 me at (503) 813-6583.

Sincerely,

A handwritten signature in black ink, appearing to read "Natasha Siores".

Natasha Siores  
Manager, Regulatory Affairs

Enclosures

## CERTIFICATE OF SERVICE

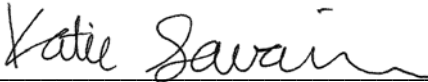
I certify that I served a true and correct copy of PacifiCorp's Renewable Portfolio Standard Implementation Plan 2019-2023 on the parties listed below via electronic mail delivery in compliance with OAR 860-001-0180. Parties qualified to receive confidential information in this docket will receive the confidential documents via overnight delivery.

### Service List UM 1790

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Dated this 28<sup>th</sup> day of December, 2017.


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Katie Savarin  
Coordinator, Regulatory Operations

**PacifiCorp**  
**Renewable Portfolio Standard**  
**Oregon Implementation Plan**  
**2019 through 2023**

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In accordance with ORS 469A.075, OAR 860-083-0400, and Order No. 16-158, PacifiCorp, d/b/a Pacific Power (Company or PacifiCorp), respectfully submits its 2019 through 2023 Oregon Renewable Implementation Plan (2019-2023 Plan) to the Public Utility Commission of Oregon (Commission).

**Summary**

This 2019-2023 Plan shows that PacifiCorp intends to meet Oregon Renewable Portfolio Standard (RPS) targets during compliance years 2019-2023 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 2019-2023 Plan was prepared with information consistent with PacifiCorp's 2017 Integrated Resource Plan (IRP), unless stated otherwise.<sup>1</sup> 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 2017 IRP Action Plan (2017 IRP Action Plan) represents a road map for implementation of the preferred portfolio. Consistent with the 2017 IRP Action Plan and preferred portfolio, the 2019-2023 Plan incorporates additional generation from repowered wind resources<sup>2</sup> and additional wind resources added in the 2021 timeframe. The current economic and regulatory environments are continually changing, and PacifiCorp may modify its plans as state and federal legislation and regulations evolve. Such changes may materially impact resource acquisitions and the timing of those acquisitions.

In the 2019-2023 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 2019-2023 Plan also includes resources anticipated to receive certification as eligible for the Oregon RPS under ORS 469A.025. The 2019-2023 Plan also assumes that all qualifying resources will be recertified with ODOE to maintain eligibility through the 2019-2023 reporting period. As shown in the 2019-2023 Plan, the existing qualifying resources and resources under development will enable PacifiCorp to meet the 2019-2023 Oregon RPS targets. The 2019-2023 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 2019-2023 reporting period. However, consistent with the 2017 IRP action plan, the Company will continue to seek cost-effective opportunities to purchase unbundled RECs for Oregon RPS compliance.

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<sup>1</sup> PacifiCorp's 2017 IRP was filed with the Commission on April 4, 2017.

<sup>2</sup> For resources that will be repowered, generation forecasts used in the 2019-2023 Plan are consistent with those used in the April 4, 2017 IRP; since the filing of the 2017 IRP, repowered wind forecasts have increased based on changed assumptions with respect to the wind turbine upgrade technology.

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

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Similar to PacifiCorp's 2017-2021 implementation plan<sup>3</sup> (the 2017-2021 Plan), the 2019-2023 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 2019-2023 Plan shows that the expected incremental costs do not trigger the four percent cost limit under ORS 469A.100.

**Implementation Plan**

The format used in the 2019-2023 Plan is to state each subsection of OAR 860-083-0400, followed by PacifiCorp's response to each of the stated subsections.

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<sup>3</sup> PacifiCorp's 2017-2021 Plan was filed with the Commission December 29, 2015, in Docket No. UM 1754; and an updated version was filed July 15, 2016, in Docket No. UM 1790.

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**OAR 860-083-0400(2)(a)**

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 December 2016 load forecast.<sup>4</sup>

<b>Table 1</b>					
	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Applicable RPS Standard as % of Electricity Sold	15%	20%	20%	20%	20%
Estimated PacifiCorp Oregon RPS Target (MWh)	1,890,291	2,503,132	2,490,010	2,490,972	2,495,850

**OAR 860-083-0400(2)(b)**

An accounting of the planned method to comply with the applicable renewable portfolio standard, including number of banked renewable energy certificates by year of issuance, the numbers of other bundled and unbundled renewable energy certificates, and alternative compliance payments.

**Response:** For the 2019-2023 Plan, the Company anticipates complying with the applicable Oregon RPS using bundled and unbundled RECs. **Attachment A** provides an accounting of the RECs applicable to the Oregon RPS program. Senate Bill (SB) 1547 eliminated the unlimited life of RECs as well as the first-in, first-out REC banking requirement. The bill also created an exception to the unlimited life restriction for long-term resources coming online between bill passage and the end of 2022—these resources will generate RECs with unlimited REC life for the first five years of the resource’s life. The 2019-2023 Plan assumes that RECs with the shortest lives will be used first for RPS compliance before RECs with longer or unlimited lives.

<sup>4</sup> Consistent with the 2017 IRP, for OAR 860-083-0400(2)(a) in this 2019-2023 Plan, the Company used the December 2016 load forecast.

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

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**OAR 860-083-0400(2)(c)**

Identification of generating facilities, either owned by the company or under contract, that are expected to provide renewable energy certificates for compliance with renewable portfolio standard. Information on each generating facility must include: (A) the renewable energy source; (B) the year the facility or contract became operational or is expected to become operational; (C) the state where the facility is located or is planned to be located; and (D) expected annual megawatt-hour output for compliance from the facility for the compliance years covered by the implementation plan.

**Response:** **Table 2** 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 2019-2023 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 the expected annual MWh output for each resource.

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Table 2**

Energy Source	Generating Facility	State	Commercial Operation Year
<b>BIOGAS</b>	Hill Air Force Base	UT	2005
<b>GEOHERMAL</b>	Blundell II	UT	2007
<b>WIND</b>	Campbell Hill-Three Buttes (PPA)	WY	2009
	Chevron Casper Wind Farm (PPA)	WY	2009
	Combine Hills (PPA)	OR	2003
	Dunlap I	WY	2010
	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	2015
	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	
Top of the World (PPA)	WY	2010	
Wolverine Creek (PPA)	ID	2005	
*New Proposed Wind	WY	2021	
<b>HYDRO</b>	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	1923
	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	
<b>SOLAR CAPACITY STANDARD</b>	Black Cap	OR	2012

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



**PacifiCorp**  
**Renewable Portfolio Standard**  
**Oregon Implementation Plan**  
**2019 through 2023**

Table 2			
Energy Source	Generating Facility	State	Commercial Operation Year
<b>OREGON SOLAR INCENTIVE</b>	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
	Oregon Solar Incentive Program - (Joseph Community) Wallowa County	OR	2011
	Oregon Solar Incentive Program - Remaining Capacity	OR	2017
	Bourdet	OR	2014
	Bourdet II	OR	2016
	Confederated Tribes of Warm Springs (CTWS)	OR	2014
	Crook County Solar	OR	2014
	Lakeview	OR	2012
	Lakeview II	OR	2013
Powell Butte	OR	2014	
Solwatt	OR	2012	
Solwatt II	OR	2014	
<b>SOLAR</b>	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

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

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

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**OAR 860-083-0400(2)(d)**

A forecast of the expected incremental costs of new qualifying electricity for facilities or contracts planned for first operation in the compliance year, consistent with the methodology in OAR 860-083-0100.

**Response:** The 2019-2023 Plan includes a forecast of expected incremental costs of qualifying electricity from seven new facilities/contracts<sup>5</sup> and the Oregon Solar Incentive Program (OSIP),<sup>6</sup> which have a cumulative capacity exceeding 50 megawatts, or purchased under a REC agreement. **Table 3** includes the forecasted incremental cost of these new resources, consistent with the methodology in OAR 860-083-0100.<sup>7</sup>

**OAR 860-083-0400(2)(e)**

A forecast of the expected incremental cost of compliance, the costs of using unbundled renewable energy certificates and alternative compliance payments for compliance, compared to annual revenue requirements, consistent with the methodologies in OAR 860-083-0100 and 860-083-0200, absent consideration of the cost limit in OAR 860-083-0300.

**Response:** **Confidential Attachment C** provides an explanation of the key assumptions that PacifiCorp used to forecast the expected incremental costs of renewable resources during the 2019-2023 reporting period, consistent with OAR 860-083-0100 and Order No. 12-272 in docket UM 1570.

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<sup>5</sup> Wyoming Wind – 1,100 MW (2021 commercial on-line date (COD)) is a resource or set of resources (contracted and/or new facilities) included in the 2017 IRP preferred portfolio; Enterprise Solar – 80 MW (2016 COD), Pavant Solar – 50 MW (2016 COD), Adams Solar – 10 MW (2018 COD), Bear Creek Solar – 10 MW (2018 COD), Bly Solar – 8.5 MW (2018 COD), Elbe Solar – 10 MW (2018 COD), reflect REC purchases. Adams, Bear Creek, Bly and Elbe are under development and anticipated to be qualifying Oregon RPS-eligible resources.

<sup>6</sup> To calculate the estimated incremental costs of the Oregon Solar Incentive Program, capacity added to the OSIP program in each year was treated as an individual resource.

<sup>7</sup> OAR 860-083-100(13)(b) states that “When the capacity of qualifying electricity described in subsection (13)(a) of this rule exceeds 20 megawatts in a compliance year or the cumulative capacity of qualifying electricity in subsection (13)(a) of this rule exceeds 50 megawatts, the incremental cost of all such qualifying electricity must be included in the compliance report for the compliance year and in compliance reports and implementation plans filed after such compliance report.”

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**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).<sup>8</sup>

Using an October 2016 official forward price curve (OFPC) that was used as a base case in the 2017 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. **Table 4** below lists the cost of unbundled RECs based on the Company’s recent purchases through the 2016 REC Request for Proposals (RFP).<sup>9</sup>

**Table 3**

**2019-2023 Summary  
Oregon Allocated Nominal Levelized Incremental Costs (\$000)  
For Specific Qualifying Resources**

**2017 IRP Base Case - October 2016 OFPC**

<b>Resource</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Blundell II	(\$634)	(\$629)	(\$629)	(\$628)	(\$629)
Campbell Hill-Three Buttes	\$1,474	\$1,463	\$1,462	\$1,461	\$1,463
Dunlap I *	(\$1,585)	(\$1,573)	(\$1,572)	(\$1,571)	(\$1,573)
Glenrock *	(\$783)	(\$777)	(\$776)	(\$776)	(\$777)
Glenrock III *	(\$195)	(\$194)	(\$194)	(\$193)	(\$194)
Goodnoe Hills	\$1,806	\$1,793	\$1,791	\$1,790	\$1,793
High Plains *	(\$296)	(\$294)	(\$293)	(\$293)	(\$293)
McFadden Ridge *	(\$347)	(\$345)	(\$345)	(\$344)	(\$345)
Marengo *	(\$997)	(\$989)	(\$988)	(\$988)	(\$989)
Marengo II *	(\$225)	(\$224)	(\$223)	(\$223)	(\$224)
Mountain Wind Power	\$212	\$211	\$211	\$211	\$211

<sup>8</sup> OAR 860-083-0100(1)(h) states that “Incremental 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).”

<sup>9</sup> Refer to workpaper included with this 2019-2023 Plan: “Unbundled RECs Workpaper CONF”

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Table 3**

**2019-2023 Summary  
Oregon Allocated Nominal Levelized Incremental Costs (\$000)  
For Specific Qualifying Resources**

**2017 IRP Base Case - October 2016 OFPC**

<b>Resource</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Mountain Wind Power II	\$773	\$767	\$767	\$766	\$767
Seven Mile Hill I *	(\$1,782)	(\$1,769)	(\$1,767)	(\$1,766)	(\$1,769)
Seven Mile Hill II *	(\$351)	(\$348)	(\$348)	(\$348)	(\$348)
Top of the World	\$3,032	\$3,010	\$3,007	\$3,005	\$3,009
Pioneer Wind Park I QF	(\$684)	(\$679)	(\$678)	(\$677)	(\$678)
Latigo Wind Park QF	\$665	\$660	\$660	\$659	\$660
Pavant II Solar QF	(\$541)	(\$537)	(\$536)	(\$536)	(\$537)
New 1100 MW WY Wind Proposal	(\$18,485)	(\$18,350)	(\$18,333)	(\$18,320)	(\$18,348)
Black Cap Solar	\$60	\$60	\$60	\$60	\$60
Adams Solar QF	\$476	\$476	\$476	\$476	\$476
Bear Creek Solar QF	\$568	\$568	\$568	\$568	\$568
Bly Solar QF	\$617	\$617	\$617	\$617	\$617
Elbe Solar QF	\$525	\$525	\$525	\$525	\$525
Enterprise Solar QF	(\$5,218)	(\$5,218)	(\$5,218)	(\$5,218)	(\$5,218)
Pavant Solar QF	(\$4,007)	(\$4,007)	(\$4,007)	(\$4,007)	(\$4,007)
OSIP_2010	\$131	\$131	\$131	\$131	\$131
OSIP_2011	\$1,265	\$1,265	\$1,265	\$1,265	\$1,265
OSIP_2012	\$811	\$811	\$811	\$811	\$811
OSIP_2013	\$959	\$959	\$959	\$959	\$959
OSIP_2014	\$615	\$615	\$615	\$615	\$615
OSIP_2015	\$232	\$232	\$232	\$232	\$232
OSIP_2016	\$108	\$108	\$108	\$108	\$108
OSIP_2017	\$28	\$28	\$28	\$28	\$28

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

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**Table 4**

**2019-2023 Summary  
Oregon Allocated Incremental Costs (\$000)  
For Unbundled RECs**

**2017 IRP Base Case- October 2016 OFPC**

<b>Resource</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Pavant Solar	\$100	\$100	\$100	\$99	\$99

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Table 5**

**2019-2023 Summary  
Oregon Allocated Nominal Levelized Incremental Costs (\$000)  
For Specific Qualifying Resources**

**Additional Scenario - November 2017 OFPC**

<b>Resource</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Blundell II	(\$603)	(\$598)	(\$598)	(\$597)	(\$598)
Campbell Hill-Three Buttes	\$1,597	\$1,585	\$1,584	\$1,583	\$1,585
Dunlap I *	(\$1,433)	(\$1,422)	(\$1,421)	(\$1,420)	(\$1,422)
Glenrock *	(\$665)	(\$660)	(\$660)	(\$659)	(\$660)
Glenrock III *	(\$150)	(\$149)	(\$149)	(\$148)	(\$149)
Goodnoe Hills	\$1,901	\$1,887	\$1,885	\$1,884	\$1,887
High Plains *	(\$173)	(\$171)	(\$171)	(\$171)	(\$171)
McFadden Ridge *	(\$312)	(\$310)	(\$310)	(\$309)	(\$310)
Marengo *	(\$862)	(\$856)	(\$855)	(\$855)	(\$856)
Marengo II *	(\$157)	(\$156)	(\$156)	(\$155)	(\$156)
Mountain Wind Power	\$270	\$268	\$268	\$268	\$268
Mountain Wind Power II	\$845	\$839	\$838	\$837	\$839
Seven Mile Hill I *	(\$1,650)	(\$1,638)	(\$1,636)	(\$1,635)	(\$1,638)
Seven Mile Hill II *	(\$325)	(\$323)	(\$322)	(\$322)	(\$323)
Top of the World	\$3,288	\$3,264	\$3,261	\$3,259	\$3,264
Pioneer Wind Park I QF	(\$543)	(\$540)	(\$539)	(\$539)	(\$539)
Latigo Wind Park QF	\$741	\$735	\$735	\$734	\$735
Pavant II Solar QF	(\$478)	(\$475)	(\$474)	(\$474)	(\$475)
New 1100 MW WY Wind Proposal	(\$15,524)	(\$15,410)	(\$15,396)	(\$15,385)	(\$15,409)
Black Cap Solar	\$66	\$66	\$66	\$66	\$66
Adams Solar QF	\$560	\$560	\$560	\$560	\$560
Bear Creek Solar QF	\$655	\$655	\$655	\$655	\$655

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Table 5**

**2019-2023 Summary  
Oregon Allocated Nominal Levelized Incremental Costs (\$000)  
For Specific Qualifying Resources**

**Additional Scenario - November 2017 OFPC**

<b>Resource</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Bly Solar QF	\$693	\$693	\$693	\$693	\$693
Elbe Solar QF	\$609	\$609	\$609	\$609	\$609
Enterprise Solar QF	(\$4,846)	(\$4,846)	(\$4,846)	(\$4,846)	(\$4,846)
Pavant Solar QF	(\$3,778)	(\$3,778)	(\$3,778)	(\$3,778)	(\$3,778)
OSIP_2010	\$131	\$131	\$131	\$131	\$131
OSIP_2011	\$1,268	\$1,268	\$1,268	\$1,268	\$1,268
OSIP_2012	\$815	\$815	\$815	\$815	\$815
OSIP_2013	\$965	\$965	\$965	\$965	\$965
OSIP_2014	\$620	\$620	\$620	\$620	\$620
OSIP_2015	\$233	\$233	\$233	\$233	\$233
OSIP_2016	\$109	\$109	\$109	\$109	\$109
OSIP_2017	\$28	\$28	\$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 7) based on the November 2017 OFPC.

**Tables 6 and 7** below show the forecast of the expected incremental cost of compliance, compared to the annual revenue requirement for each year in the 2019-2023 reporting period. **Table 6** is based on the incremental cost forecast from **Table 3 and 4** (the 2017 IRP Update Base Case – October 2016 OFPC). **Table 7** is based on the incremental cost forecast from the additional sensitivity scenario shown in **Table 5** (November 2017 OFPC). The Company’s 2019-2023 Plan does not forecast the use of alternative compliance payments at this time. The Oregon allocated nominal levelized incremental cost was calculated by using an average \$/MWh based on the incremental cost calculations for each resource, multiplied by the number of forecasted bundled RECs.

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

The annual revenue requirement was calculated consistent with the methodology in OAR 860-083-0200. According to the rule, this methodology adjusts the last approved revenue requirement for forecasted load. These tables show that the four percent cost limit is not triggered. Actual cost of compliance may vary from the calculations shown below.

**Table 6**

**Based on Table 3 Data (2017 IRP Update Base Case – October 2016 OFPC Fuel Curve)**

	Oregon Allocated Nominal Levelized Incremental Cost (\$000s)			Annual Revenue Requirement (\$000s)	Cost as % Oregon Annual Revenue Requirement	4% of Revenue Requirement
	Bundled	Unbundled	Total			
<b>2019</b>	\$2,093	\$100	\$2,194	\$1,254,282	0.17%	\$50,571
<b>2020</b>	\$1,979	\$100	\$2,079	\$1,244,705	0.17%	\$49,788
<b>2021</b>	(\$10,884)	\$100	(\$10,784)	\$1,238,251	-0.87%	\$49,530
<b>2022</b>	(\$14,421)	\$100	(\$14,322)	\$1,236,368	-1.16%	\$49,455
<b>2023</b>	(\$14,557)	\$99	(\$14,457)	\$1,236,079	-1.17%	\$49,443



**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Table 7**

Based on Table 5 Data (Sensitivity - November 2017 OFPC Fuel Curve)

	Oregon Allocated Nominal Levelized Incremental Cost (\$000s)			Annual Revenue Requirement (\$000s)	Cost as % Oregon Annual Revenue Requirement	4% of Revenue Requirement
	Bundled	Unbundled	Total			
<b>2019</b>	\$3,998	\$100	\$4,191	\$1,254,282	0.33%	\$50,571
<b>2020</b>	\$4,566	\$100	\$3,613	\$1,244,705	0.37%	\$49,788
<b>2021</b>	(\$7,655)	\$100	(\$7,556)	\$1,238,251	-0.61%	\$49,530
<b>2022</b>	(\$10,139)	\$100	(\$10,039)	\$1,236,368	-0.81%	\$49,455
<b>2023</b>	(\$10,291)	\$99	(\$10,191)	\$1,236,079	-0.82%	\$49,443

**OAR 860-083-0400(2)(f)**

A forecast of the number and cost of bundled renewable energy certificates issued, consistent with the methodology in OAR 860-083-0100.

**Response: Attachment A** provides the forecasted number of bundled RECs. **Tables 6 and 7** above show the costs for the bundled RECs included in the 2019-2023 Plan.

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**OAR 860-083-0400(4)**

If there are material differences in the planned actions in [OAR 860-083-0400(2)] of this rule from the action plan in the most recently filed or updated integrated resource plan by the electric company, or if conditions have materially changed from the conditions assumed in such filing, the company must provide sufficient documentation to demonstrate how the implementation plan appropriately balances risks and expected costs as required by the integrated resource planning guidelines in 1.b and c. of Commission Order No. 07-047 and subsequent guidelines related to implementation plans set forth by the Commission. Unless provided in the most recently filed or updated integrated resource plan, an implementation plan for an electric company subject to ORS 469A.052 must include the following information:

- (a) At least two forecasts for subsections (2)(d), (e), and (f) of this rule: one forecast assuming existing government incentives continue beyond their current expiration date and another forecast assuming existing government incentives do not continue beyond their current expiration date;
- (b) A reasonable range of estimates for the forecasts in subsections (2)(d), (e), and (f) of this rule, consistent with subsection (4)(a) of this rule and the analyses or methodologies in the company's most recently filed or updated integrated resource plan.

**Response:** On December 20, 2017, Congress passed the Tax Cuts and Jobs Act which makes changes to the federal tax code, including changes to corporate tax levels which will materially change the conditions assumed in the 2017 IRP. In particular, the corporate tax level influences the discount rate and the value of the federal Production Tax Credits. On December 22, 2017, President Trump signed the tax bill into law. PacifiCorp is currently in the process of conducting a complete analysis of the impact of the tax bill on the 2017 IRP Action Plan, preferred portfolio, and 2017 resource RFP results. Because the changes to the tax code are very recent, this analysis is not yet fully complete. However, PacifiCorp prepared a sensitivity, as shown in **Table 8** below, providing an estimate of incremental costs if the new corporate tax rate is assumed.

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Table 8**

Based on Table 3 Data (2017 IRP Update Base Case – October 2016 OFPC Fuel Curve)  
(Sensitivity New Corporate Tax Rate)

	Oregon Allocated Nominal Levelized Incremental Cost (\$000s)			Annual Revenue Requirement (\$000s)	Cost as % Oregon Annual Revenue Requirement	4% of Revenue Requirement
	Bundled	Unbundled	Total			
<b>2019</b>	\$3,580	\$100	\$3,680	\$1,254,282	0.29%	\$50,571
<b>2020</b>	\$4,134	\$100	\$4,234	\$1,244,705	0.34%	\$49,788
<b>2021</b>	(\$7,251)	\$100	(\$7,151)	\$1,238,251	-0.58%	\$49,530
<b>2022</b>	(\$9,581)	\$100	(\$9,481)	\$1,236,368	-0.77%	\$49,455
<b>2023</b>	(\$9,753)	\$99	(\$9,654)	\$1,236,079	-0.78%	\$49,443

- (a) As noted in **Confidential Attachment C**, consistent with the 2017 IRP, the Company assumes that existing government incentives expire in accordance with their current expiration date. The Tax Cuts and Jobs Act retains the same expiration dates assumed in the 2017 IRP.
- (b) **Confidential Attachment D** includes a range of forecasts for expected incremental costs. The summary results for the October 2016 OFPC are shown in **Table 3**. **Confidential Attachment D** also includes the additional sensitivity scenario for the November 2017 OFPC, and the summary results are shown in **Table 5**.

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

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**OAR 860-083-0400(5)**

Under the following circumstances, the electric company must, for the applicable compliance year, provide sufficient documentation or citations to demonstrate how the implementation plan appropriately balances risks and expected costs as required by the integrated resource planning guidelines in 1.b. and c. of Commission Order No. 07-047 and subsequent guidelines related to implementation plans set forth by the Commission.

- (a) The sum of costs in subsection (2)(e) of this rule is expected to be four percent or more of the annual revenue requirement in subsection (2)(e) of this rule for any compliance year covered by the implementation plan,
- (b) The company plans, for reasons other than to meet unanticipated contingencies that arise during a compliance year, to use any of the following compliance methods: (A) Unbundled renewable energy certificates; (B) Bundled renewable energy certificates issued between January 1 through March 31 of the year following the compliance year; or (C) Alternative compliance payments, or
- (c) The company plans to sell any bundled renewable energy certificates included in the rates of Oregon retail electricity consumers.

**Response:**

- (a) This requirement is not applicable at this time since the sum of the costs in subsection (2)(e) above are not expected to exceed four percent of the annual revenue requirement in any compliance year that is reported in the Company's 2019-2023 Plan.
- (b) For the 2019 through 2023 reporting period, the Company expects to comply with the Oregon RPS requirements by using a combination of bundled and unbundled RECs. 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 RFP.<sup>10</sup> 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.

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<sup>10</sup> PacifiCorp continues to treat as unbundled RECs the portion of RECs purchased under the 2016 REC Request for Proposals (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 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 AR 610 and so has not proposed any changes from those discussed in docket UE 313 as part of this 2019-2023 Plan.

**PacifiCorp**  
**Renewable Portfolio Standard**  
**Oregon Implementation Plan**  
**2019 through 2023**

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The 2016 REC RFP was issued on April 20, 2016, and the competitive procurement process was completed in September 2016. The Company executed REC agreements with solar and wind projects located in Oregon, Utah, and Colorado. PacifiCorp's 2017 IRP and 2019-2023 Plan include the use of these unbundled RECs in the 2019-2023 period for RPS compliance.

A full discussion of the balance of risks and expected costs associated with the 2016 REC RFP purchases can be found in docket UM 1790, PacifiCorp's Updated 2016 RPIP filed July 15, 2016, and docket UE 313, PacifiCorp's requests for recovery of costs associated with the 2016 REC RFP purchases. Specific discussion of the Company's analysis and decision-making process can be found in docket UE 313, Order No. 17-019, Attachment 1 at pages 1-2.

- (c) This requirement is not applicable at this time because the Company's plan does not include the sale of bundled Oregon-allocated RECs from RPS eligible renewable resources included in the rates of Oregon customers.

**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..."<sup>11</sup>

**Attachment E** provides a summary of the RPS incremental costs by resource for each scenario and **Attachment F** provides a summary of the RPS total incremental costs for each scenario analyzed in the 2019-2023 Implementation Plan.

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<sup>11</sup> *In the Matter of PacifiCorp, dba Pacific Power, Renewable Portfolio Standard Implementation Plan 2015-2019, Docket No. UM 1681, Order No. 14-267 at Appendix A (Jul. 22, 2014).*

**PacifiCorp**  
**Renewable Portfolio Standard**  
**Oregon Implementation Plan**  
**2019 through 2023**

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- Include “in subsequent [implementation plans] a scenario that uses the base case price curve assumptions (medium gas and medium CO2 prices) similar that 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.”<sup>12</sup>

**Table 9** below provides a sensitivity for the base case scenario (October 2016 OFPC) that maximizes the use of unbundled RECs in each year of the 2019-2023 Plan. For this scenario, the Company assumed an unbundled REC price of \$0.94 per REC, consistent with PacifiCorp’s 2016 Compliance Report filed in docket UM 1846.<sup>13</sup>

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 intends to periodically issue solicitations for unbundled RECs to assess cost-effective compliance opportunities. However, the acquisition of additional unbundled RECs, which may lower the incremental cost of compliance in the short-term (depending on the REC price assumed), may increase the risk that shorter-lived RECs in PacifiCorp’s REC bank will expire before they are used. Accordingly, given the significant REC bank projected into future years, PacifiCorp has not sought to maximize unbundled RECs in the 2019-2023 Plan.

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<sup>12</sup> *Id.*

<sup>13</sup> Refer to workpaper included with this 2019-2023 Plan “Unbundled RECs Workpaper CONF”.

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Table 9**

**Sensitivity - Annual Unbundled RECs Maximized (20%)  
2017 IRP Base Case October 2016 OFPC**

	MWh				
	2019	2020	2021	2022	2023
	Forecast	Forecast	Forecast	Forecast	Forecast
<b><u>Oregon Renewable Portfolio Standard Requirement</u></b>	1,890,291	2,503,132	2,490,010	2,490,972	2,495,850
<b><u>Planned Compliance Method (MWh)</u></b>					
Bundled RECs	1,535,196	1,546,686	1,549,389	2,061,187	2,053,002
Unbundled RECs	378,058	500,626	498,002	498,194	499,170
<b><u>Forecasted Cost (\$/MWh)</u></b>					
Bundled REC (Average \$/MWh)	\$ 1.14	\$ 0.81	\$ (5.62)	\$ (5.60)	\$ (5.67)
Unbundled REC (Average \$/MWh)	\$ 0.94	\$ 0.94	\$ 0.94	\$ 0.94	\$ 0.94
<b><u>Total Forecasted Incremental Cost of Compliance</u></b>	\$ 2,111,059	\$ 1,723,148	\$ (8,238,848)	\$ (11,068,754)	\$ (11,176,016)
Bundled REC	\$ 1,755,684	\$ 1,252,559	\$ (8,706,970)	\$ (11,537,057)	\$ (11,645,236)
Unbundled REC	\$ 355,375	\$ 470,589	\$ 468,122	\$ 468,303	\$ 469,220

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 (RPS) 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

**PacifiCorp**  
**Renewable Portfolio Standard**  
**Oregon Implementation Plan**  
**2019 through 2023**

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Participate in a stakeholder workshop to identify opportunities for revisions to the RPIP process and requirements.<sup>14</sup>

PacifiCorp has not commenced a resource procurement action for the purpose of complying with the RPS that materially deviates from the 2017 IRP.

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<sup>14</sup> *In the Matter of PacifiCorp, dba Pacific Power, 2017-2021 Renewable Portfolio Standard Implementation Plan*, Docket No. UM 1790, Order No. 17-010 at 1 (Jan. 13, 2017).



**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**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.

**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 2019-2023 Plan on its website within 30 days after a Commission acknowledgement order is issued. The Company will provide the public portions of the 2019-2023 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 2019-2023 Plan to its customers via bill inserts within 90 days of the final action by the Commission.

**PacifiCorp  
Renewable Portfolio Standard Oregon  
Implementation Plan  
2019-2023**

**Attachment A**

**Accounting of RECs Applicable to  
Oregon RPS**

PacifiCorp Oregon - 2019-2023 RPS Implementation Plan  
Attachment A - Accounting of RECs Applicable to Oregon RPS for 2007-2016

	MWh - 2007 - 2015									
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual
<b>Oregon Renewable Portfolio Standard Requirement</b>	-	-	-	-	650,729	638,940	654,498	647,937	1,929,369	1,930,346
<b>Compliance Method</b>										
Bundled RECs					650,729	511,152	523,600	518,350	1,717,643	1,685,228
Unbundled RECs						127,788	130,899	129,587	211,726	245,118
Bundled RECs by vintage year <sup>(1)</sup>	355,038	572,302	822,402	1,247,291	1,776,846	1,588,069	1,476,704	1,549,424	1,329,263	1,721,067
Unbundled RECs by vintage year <sup>(1)</sup>	44,000	127,342	-	8,356	122,916	243,819	53,567			10,251
Cumulative Banked RECs minus RPS requirement by year of compliance <sup>(2)</sup>	399,038	1,098,683	1,921,085	3,176,732	4,425,765	5,618,713	6,494,486	7,395,973	6,795,867	6,596,839
Alternative compliance payments					-	-	-	-	-	-

**Notes**

(1) 2019-2023 Implementation Plan - Attachment B - Oregon's Share Per Allocation Factors - Renewable Portfolio Standard Renewable Energy Credits (MWh)

(2) RECs with the shortest life will be used first for RPS compliance before RECs with longer or unlimited lives.

PacifiCorp Oregon - 2019-2023 RPS Implementation Plan  
Attachment A - Accounting of RECs Applicable to Oregon RPS for 2017-2023

	MWh - 2016-2023							
	Pre-2017	2017	2018	2019	2020	2021	2022	2023
		Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
<b>Oregon Renewable Portfolio Standard Requirement</b> <sup>(1)</sup>		1,905,429	1,896,552	1,890,291	2,503,132	2,490,010	2,490,972	2,495,850
Bundled RECs		1,844,879	1,836,142	1,830,380	2,443,281.44	2,430,451	2,431,570	2,436,515
Unbundled RECs		60,549	60,410	59,910	59,850	59,559	59,403	59,335
<b>Available Resources</b>								
Starting Bank (Beginning of 2016)	6,596,839							
Total Bundled RECs by vintage year		1,838,955	1,936,725	1,927,289	1,969,407	3,025,636	3,021,076	3,034,494
Bundled - Golden		194,749	232,186	234,175	232,475	1,283,373	1,281,849	1,283,303
Bundled 5 Year		1,644,206	1,704,538	1,693,115	1,736,932	1,742,263	1,739,226	1,751,190
Total Unbundled RECs by vintage year		161,442	204,690	202,997	202,788	201,809	201,277	201,047
Unbundled - Golden		100,893	144,280	143,087	142,937	142,249	141,875	141,713
Unbundled 5 Year		60,549	60,410	59,910	59,850	59,559	59,403	59,335
Cumulative Banked RECs minus RPS requirement by year of compliance <sup>(2)</sup>		6,691,806	6,936,669	7,176,665	6,845,728	7,583,163	8,314,544	9,054,234
Alternative compliance payments		-	-	-	-	-	-	-

**Notes**

(1) Based on Retail Load Forecast, December 2016 (Consistent with 2017 IRP Preferred Portfolio)

(2) RECs with the shortest life will be used first for RPS compliance before RECs with longer or unlimited lives.

**PacifiCorp  
Renewable Portfolio Standard Oregon  
Implementation Plan  
2019-2023**

**Confidential Attachment B**

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

**(Redacted Version)**



**PacifiCorp Oregon - 2019-2023 RPS Implementation Plan**  
**Attachment B - Oregon's Renewable Energy Credit Share Per Allocation Factors (MWh)<sup>(1)</sup>**

	State	COD <sup>(2)</sup>	WREGIS ID	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
				Actual <sup>(3)</sup>	Actual <sup>(3)</sup>	Actual <sup>(3)</sup>	Actual <sup>(3)</sup>	Actual <sup>(3)</sup>	Actual <sup>(3)</sup>	Actual <sup>(3)</sup>	Actual <sup>(3)</sup>	Actual <sup>(3)</sup>	Actual <sup>(3)</sup>	Forecast <sup>(3)</sup>	Forecast <sup>(3)</sup>	Forecast <sup>(3)</sup>	Forecast <sup>(3)</sup>	Forecast <sup>(3)</sup>	Forecast <sup>(3)</sup>	Forecast <sup>(3)</sup>	
Oregon Solar Incentive Program - Southern Oregon (SO 9)	OR	2013	W4084								275	338	406								
Oregon Solar Incentive Program - Southern Oregon (SO 10)	OR	2014	W4187								152	446	415								
Oregon Solar Incentive Program - Southern Oregon (SO 11)	OR	2014	W4485								1	363	314								
Oregon Solar Incentive Program - Southern Oregon (SO 12)	OR	2015	W4576									146	356								
Oregon Solar Incentive Program - Southern Oregon (SO 13)													4								
Oregon Solar Incentive Program - Willamette Valley (WV 1)	OR	2010	W1739				6	253	280	314	308	313	300								
Oregon Solar Incentive Program - Willamette Valley (WV 2)	OR	2011	W2326					14	202	380	395	391	427								
Oregon Solar Incentive Program - Willamette Valley (WV 3)	OR	2012	W3208						25	333	329	326	327								
Oregon Solar Incentive Program - Willamette Valley (WV 4)	OR	2013	W3396							367	313	243	323								
Oregon Solar Incentive Program - Willamette Valley (WV 5)	OR	2013	W3410							256	323	328	356								
Oregon Solar Incentive Program - Willamette Valley (WV 6)	OR	2013	W3673							44	348	340	326								
Oregon Solar Incentive Program - Willamette Valley (WV 7)	OR	2014	W4085								118	323	340								
Oregon Solar Incentive Program - Willamette Valley (WV 8)	OR	2015	TBD									37	331								
Oregon Solar Incentive Program - Willamette Valley (WV 9)	OR												260								
Oregon Solar Incentive Program - Willamette Valley (WV 10)	OR																				
Oregon Solar Incentive Program - (Joseph Community) Wallowa County	OR	2011	W2448					44	666	746	740	667	685								
Oregon Solar Incentive Program - Remaining Capacity	OR	2016-2017	TBD									1	132								
Bourdet	OR	2014	W4486									95	135								
Bourdet II	OR	2016	TBD										86								
Confederated Tribes of Warm Springs (CTWS)	OR	2014	W4105								292	309	330								
Crook County Solar	OR	2014	W3847							244	973	870	933								
Lakeview	OR	2012	W3468							248	596	699	660								
Lakeview II	OR	2013	W3960								839	898	910								
Powell Butte	OR	2014	W4274								123	288	302								
Solwatt	OR	2012	W2968						257	484	521	509	506								
Solwatt II	OR	2014	W4273								110	294	304								
<b>Total Oregon Solar Incentive</b>							<b>25</b>	<b>1,429</b>	<b>4,604</b>	<b>8,342</b>	<b>12,692</b>	<b>14,510</b>	<b>15,583</b>								
<b>SOLAR</b>																					
Pavant Solar II LLC	UT	2016	W5057										3,718								
Pavant Solar, LLC	UT	2015	W4619										10,251								
Enterprise Solar, LLC	UT	2016	W4938										21,961								
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																			
<b>Total Solar</b>													<b>35,930</b>								
<b>SOLAR CAPACITY STANDARD</b>																					
Black Cap	OR	2012	W3104						585	4,699	4,307	4,600	4,021								
<b>Total Utility Solar</b>									<b>585</b>	<b>4,699</b>	<b>4,307</b>	<b>4,600</b>	<b>4,021</b>								
<b>New 1100 MW WY Wind Proposal</b>																					
New 1100 MW WY Wind Proposal	WY	2021	TBD																		
<b>Total New Wind</b>																					
<b>Total</b>					<b>355,038</b>	<b>572,302</b>	<b>822,402</b>	<b>1,247,291</b>	<b>1,776,846</b>	<b>1,588,069</b>	<b>1,476,704</b>	<b>1,549,424</b>	<b>1,329,263</b>	<b>1,721,067</b>	<b>1,838,955</b>	<b>1,936,725</b>	<b>1,927,289</b>	<b>1,969,407</b>	<b>3,025,636</b>	<b>3,021,076</b>	<b>3,034,494</b>
<b>Oregon's Share Based on SG Allocation Factors<sup>(3)</sup></b>					<b>27.44%</b>	<b>28.19%</b>	<b>27.49%</b>	<b>26.20%</b>	<b>26.41%</b>	<b>25.93%</b>	<b>25.20%</b>	<b>25.51%</b>	<b>25.47%</b>	<b>25.57%</b>							

(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.

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**Attachment B - Unbundled RECs**  
**Page 1 of 1**

Compliance Purchases Oregon RPS (MWh)	Transaction Date	Fuel	State	WREGIS ID	Commercial Operation Date	Price	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
	1/25/2013	Biogas	ID																				
		Wind	OR																				
		Biogas	OR																				
		Biogas	OR																				
		Wind	WA																				
	1/25/2013	Wind	CA																				
		Wind	CA																				
	2/6/2013	Wind	WA																				
		Wind	WA																				
		Hydroelectric	WA																				
		Hydroelectric	WA																				
		Hydroelectric	WA																				
		Hydroelectric	WA																				
	2/11/2013	Wind	OR																				
	2/6/2013	Wind	OR																				
		Wind	OR																				
		Wind	WY																				
		Wind	OR																				
		Wind	WA																				
	1/31/2013	Biogas	OR																				
	2/4/2013	Wind	WA																				
		Wind	WA																				
	2/4/2013	Wind	WA																				
		Wind	WA																				
		Wind	WA																				
	6/28/2013	Wind	NM																				
		Wind	OR																				
	2/28/2013	Wind	WA																				
	7/9/2013	Wind	WA																				
		Wind	WA																				
	8/28/2013	Wind	OR																				
	11/5/2013	Wind	OR																				
		Wind	WA																				
	8/10/2016	Wind	CO																				
		Wind	CO																				
	8/18/2016	Solar	UT																				
	8/18/2016	Solar	UT																				
	9/2/2016	Solar	OR																				
	9/2/2016	Solar	OR																				
	9/2/2016	Solar	OR																				
	9/2/2016	Solar	OR																				
	9/2/2016	Solar	OR																				
<b>Total</b>							44,000	127,342	0	8,356	122,916	192,496	104,890	147,513	158,728	10,251	161,442	204,690	202,997	202,788	201,809	201,277	201,047



**PacifiCorp  
Renewable Portfolio Standard Oregon  
Implementation Plan  
2019-2023**

**Confidential Attachment C**

**Preliminary Key Assumptions  
Incremental Cost Calculation**

**(Redacted Version)**

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Key Assumptions – Expected Incremental Cost Calculation**

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**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, 2018, that provides, among other things, a forecast of expected incremental costs of renewable resources in service during the 2019-2023 Oregon Renewable Portfolio Implementation Plan (2019-2023 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 2019-2023 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 RPS law that materially deviates from the filed IRP or RPIP, it must calculate new incremental costs and respond to requests from the Commission regarding that analysis.

The incremental cost calculations for this filing are aligned with PacifiCorp's 2017 Integrated Resource Plan (IRP) filed April 4, 2017 (2017 IRP). Specifically, values reflect IRP's least-cost, least-risk resource portfolio (Preferred Portfolio), which assumes upgrades or "repowering" to existing wind generation facilities and an additional 1,100 Megawatts (MW) of anticipated wind in Wyoming.

On December 20, 2017, Congress passed the Tax Cuts and Jobs Act which makes changes to the federal tax code, including changes to corporate tax levels which will materially change the conditions assumed in the 2017 IRP. In particular, the corporate tax level influences the discount rate and the value of the federal Production Tax Credits. To demonstrate the potential impact of the tax code change on incremental costs, PacifiCorp prepared a sensitivity analysis with the following assumptions. Reducing the US tax rate from 35% to 21% would reduce the effective tax rate to 24.587% (federal rate of 21% and state rate of 4.54%). In contrast, the effective tax rate of 37.951% was assumed in the IRP. This would increase the discount rate to 6.91% from 6.57% assumed in the IRP.

**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 2017 IRP. For qualifying renewable resources currently in service, forecasted ongoing capital, and operation and maintenance (O&M) from the

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Key Assumptions – Expected Incremental Cost Calculation**

---

most recently available 10 year Business Plan are used. Actual ongoing capital and O&M values are used for historical period of 2007-2016.

*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. 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 2017 IRP forecast for generation, capital, fixed and variable O&M and PTCs. Repowering will extend the life of the facility by 30 years therefore the incremental costs are levelized over the extended period of 41 years.

*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 the number of forecasted bundled renewable energy certificates (RECs). Six new renewable resources were added in this year's filing: Adams Solar, Bear Creek Solar, Bly Solar, Elby Solar, Enterprise Solar and Pavant Solar, LLC. The generation from these Qualifying Facilities (QFs) are acquired through non-renewable price PPA contracts with a supplemental agreement for PacifiCorp to purchase their RECs. The incremental cost analysis includes the normal levelized cost of the non-renewable contract price per megawatt plus the cost of the REC purchase based on the contracted price per REC for each resource.

*Proxy Plant*

Seven new long-term qualifying renewable resources are contemplated in the 2019-2023 incremental cost analysis: New 1,100 MW Wyoming Wind and the six PPA/REC resources noted above.

The proxy plants used in this analysis for new qualifying renewable facilities are from PacifiCorp's 2017 IRP. East side is based on a combined cycle combustion turbine (CCCT Dry "J/HA.02", 1x1) at the Dave Johnston Brownfield location. The West side proxy plant is (CCCT Dry "G/H", 1x1) at the Willamette Valley location.

**PacifiCorp**  
**Renewable Portfolio Standard**  
**Oregon Implementation Plan**  
**2019 through 2023**

**Key Assumptions – Expected Incremental Cost Calculation**

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The proxy plant used in this analysis for the existing qualifying facilities continue to be a combined cycle combustion turbine (CCCT water-cooled “F” class 2x1 with duct firing) at the Lake Side location from the 2008 IRP for the 2015-2019 filing; and the combined cycle combustion turbine (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. The proxy plant’s characteristics remain unchanged from those stated in the 2015-2019 Plan analysis.

The following price curve scenarios<sup>1</sup> are considered in the incremental cost analysis:

- Scenario 1: October 2016 OFPC (Base case OFPC used in 2017 IRP Update)
- Scenario 2: October 2016 OFPC High Gas/Clean Power Plan (CPP A)
- Scenario 3: October 2016 OFPC Low Gas/ Clean Power Plan (CPP A)
- Scenario 4: October 2016 OFPC Medium Gas/ Clean Power Plan (CPP A)
- Scenario 5: October 2016 OFPC High Gas/ Clean Power Plan (CPP B)
- Scenario 6: October 2016 OFPC Low Gas/ Clean Power Plan (CPP B)
- Scenario 7: November 2017 OFPC

Consistent with the discussion in Commission Order No. 09-299,<sup>2</sup> capital costs and O&M costs for the existing proxy plants based on 2008 IRP and 2015 IRP remain unchanged from the Company’s 2017-2021 Plan.<sup>3</sup> Capital and O&M costs for the 2017 proxy plants are based on 2017 IRP.<sup>4</sup>

Consistent with the 2017 IRP, fuel price data is from the Company’s November 2017 official forward price curve (OFPC) with natural gas delivered at the Lake Side, Dave Johnston Brownfield and Willamette Valley locations.

The proxy plant CCCTs are sized to have the 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.

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<sup>1</sup> Scenarios 1-6 are from the 2017 IRP Table 7.1 page 152. See PacifiCorp’s 2017 IRP page 151 for details on CPP A and CPP B emission policy scenarios.

<sup>2</sup> See Order No. 09-299 (August 3, 2009), AR 518 Phase III, page 4.

<sup>3</sup> The Company’s 2015-2019 Plan was filed with the Commission on December 27, 2013 in docket UM 1570.

<sup>4</sup> See PacifiCorp’s 2017 IRP – Volume I, Chapter 6, Tables 6.1 and 6.2.

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Key Assumptions – Expected Incremental Cost Calculation**

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Consistent with Order No. 12-272 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 2019-2023 Plan.

**PacifiCorp**  
**Renewable Portfolio Standard**  
**Oregon Implementation Plan**  
**2019 through 2023**

**Key Assumptions – Expected Incremental Cost Calculation**

<b>Table 1 – List of Qualifying Resources Included in Incremental Cost</b>				
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	25
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 <sup>5</sup>		2010-2017	9.8	15

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. Leaning Juniper, Foote Creek II and Foote Creek III are not included in the calculation, as these resources

<sup>5</sup> To calculate the estimated incremental costs of the Oregon Solar Incentive Program, capacity added to the OSIP program in each year was treated as an individual resource.

**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Key Assumptions – Expected Incremental Cost Calculation**

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.<sup>6</sup>

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

<b>Table 2 – Power Purchase Agreements (PPAs)</b>					
<b>Resource</b>	<b>PPA Annual Nominal Levelized Contract Price (\$/MWh)</b>	<b>REC Price</b>	<b>Contract Start Year</b>	<b>Average Capacity (MW)</b>	<b>Contract Term (Years)</b>
Adams Solar QF (PPA) + RECs			2018	10	10
Bear Creek Solar QF (PPA) + RECs			2018	10	10
Bly Solar QF (PPA) + RECs			2018	8.5	10
Campbell Hill-Three Buttes (PPA)			2009	99	20
Elbe Solar QF (PPA) + RECs			2018	10	10
Enterprise Solar QF+ RECs			2016	80	21
Mountain Wind Power (PPA)			2008	60.9	25
Mountain Wind Power II (PPA)			2008	79.8	25
Top of the World (PPA)			2010	200.2	20
Pavant Solar QF+ RECs			2016	50	20
Pioneer Wind			2016	80	20
Latigo Wind Park QF			2015	60	20
Pavant II Solar QF			2016	50	20

Consistent with the 2017 IRP, a discount rate of 6.570% has been used in this expected incremental cost analysis. The associated payment factors have also been applied consistent with the 2017 IRP. To assess the impact of a recent tax code change, a sensitivity analysis was prepared using a higher discount rate to 6.91%.

<sup>6</sup>*In the Matter of PacifiCorp, dba Pacific Power 2009 Renewable Adjustment Clause Schedule 202, Docket UE 200, Order 548 at 19-20 (Nov. 14, 2008).*

**PacifiCorp**  
**Renewable Portfolio Standard**  
**Oregon Implementation Plan**  
**2019 through 2023**

**Key Assumptions – Expected Incremental Cost Calculation**

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Inflation values are based on the Company's official inflation forecast. However, where a calculation requires a single value, the 2.2% average annual inflation rate from 2017-2040 was used. Otherwise, yearly values from the Company's official inflation forecast have been applied.

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 37.951%. To capture the impact of a recent tax code change, a sensitivity analysis was prepared using 24.587% effective tax rate.

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 2007-2016 are actuals; generation values for 2017 include a combination of actual generation from January through September 2017 and forecasted values for October through December 2017. Generation values for years 2018 and beyond are forecasted.

The wind integration costs for calendar years (CY) 2007-2016 are from the Company'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 2017 and beyond are based on the 2017 Flexible Resource Study (2017 IRP Appendix F, Table F.2).

Peak Capacity Contribution values for qualifying facilities are derived from the values from the 2017 IRP.<sup>7</sup>

Payment factors for qualifying facilities are updated using the discount rate from the 2017 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 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

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<sup>7</sup> See the Company's 2017 IRP – Volume II, Appendix N, Table N.1, p. 316.



**PacifiCorp  
Renewable Portfolio Standard  
Oregon Implementation Plan  
2019 through 2023**

**Key Assumptions – Expected Incremental Cost Calculation**

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consumption by the Company’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.

**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 2015 load forecast.

<b>Table 3 – Allocation Factors</b>	
<b>Year</b>	<b>SG Allocation Factor</b>
2019	
2020	
2021	
2022	
2023	

**PacifiCorp  
Renewable Portfolio Standard Oregon  
Implementation Plan  
2019-2023**

**Confidential Attachment D**

**Incremental Cost Analysis**

**Subject to Protective Order**

**THIS ATTACHMENT IS  
CONFIDENTIAL IN ITS ENTIRETY  
AND PROVIDED UNDER SEPARATE  
COVER**

**PacifiCorp  
Renewable Portfolio Standard Oregon  
Implementation Plan  
2019-2023**

**Attachment E**

**Scenarios 1-7**

**Summary of Incremental Cost by  
Resource**

## PacifiCorp - Oregon 2019-2023 RPS Implementation Plan Attachment E - Summary of RPS Incremental Costs by Resource

Scenario 1: Oct 12, 2016 OFPC IRP BASE 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	(\$634)	(\$629)	(\$629)	(\$628)	(\$629)
Campbell Hill-Three Buttes	\$1,474	\$1,463	\$1,462	\$1,461	\$1,463
Dunlap I	(\$1,585)	(\$1,573)	(\$1,572)	(\$1,571)	(\$1,573)
Glenrock	(\$783)	(\$777)	(\$776)	(\$776)	(\$777)
Glenrock III	(\$195)	(\$194)	(\$194)	(\$193)	(\$194)
Goodnoe Hills	\$1,806	\$1,793	\$1,791	\$1,790	\$1,793
High Plains	(\$296)	(\$294)	(\$293)	(\$293)	(\$293)
McFadden Ridge	(\$347)	(\$345)	(\$345)	(\$344)	(\$345)
Marengo	(\$997)	(\$989)	(\$988)	(\$988)	(\$989)
Marengo II	(\$225)	(\$224)	(\$223)	(\$223)	(\$224)
Mountain Wind Power	\$212	\$211	\$211	\$211	\$211
Mountain Wind Power II	\$773	\$767	\$767	\$766	\$767
Seven Mile Hill I	(\$1,782)	(\$1,769)	(\$1,767)	(\$1,766)	(\$1,769)
Seven Mile Hill II	(\$351)	(\$348)	(\$348)	(\$348)	(\$348)
Top of the World	\$3,032	\$3,010	\$3,007	\$3,005	\$3,009
Pioneer Wind Park I QF	(\$684)	(\$679)	(\$678)	(\$677)	(\$678)
Latigo Wind Park QF	\$665	\$660	\$660	\$659	\$660
Pavant II Solar QF	(\$541)	(\$537)	(\$536)	(\$536)	(\$537)
New 1100 MW WY Wind Proposal	(\$18,485)	(\$18,350)	(\$18,333)	(\$18,320)	(\$18,348)
Black Cap Solar	\$60	\$60	\$60	\$60	\$60
Adams Solar QF	\$476	\$476	\$476	\$476	\$476
Bear Creek Solar QF	\$568	\$568	\$568	\$568	\$568
Bly Solar QF	\$617	\$617	\$617	\$617	\$617
Elbe Solar QF	\$525	\$525	\$525	\$525	\$525
Enterprise Solar QF	(\$5,218)	(\$5,218)	(\$5,218)	(\$5,218)	(\$5,218)
Pavant Solar QF	(\$4,007)	(\$4,007)	(\$4,007)	(\$4,007)	(\$4,007)
OSIP_2010	\$131	\$131	\$131	\$131	\$131
OSIP_2011	\$1,265	\$1,265	\$1,265	\$1,265	\$1,265
OSIP_2012	\$811	\$811	\$811	\$811	\$811
OSIP_2013	\$959	\$959	\$959	\$959	\$959
OSIP_2014	\$615	\$615	\$615	\$615	\$615
OSIP_2015	\$232	\$232	\$232	\$232	\$232
OSIP_2016	\$108	\$108	\$108	\$108	\$108
OSIP_2017	\$28	\$28	\$28	\$28	\$28

## PacifiCorp - Oregon 2019-2023 RPS Implementation Plan Attachment E - Summary of RPS Incremental Costs by Resource

Scenario 2: Oct 12, 2016 OFPC Scenario High Gas CPP A 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	(\$832)	(\$826)	(\$825)	(\$825)	(\$826)
Campbell Hill-Three Buttes	\$767	\$761	\$760	\$760	\$761
Dunlap I	(\$3,024)	(\$3,002)	(\$2,999)	(\$2,997)	(\$3,001)
Glenrock	(\$1,881)	(\$1,867)	(\$1,866)	(\$1,864)	(\$1,867)
Glenrock III	(\$620)	(\$615)	(\$615)	(\$614)	(\$615)
Goodnoe Hills	\$1,204	\$1,195	\$1,194	\$1,193	\$1,195
High Plains	(\$1,449)	(\$1,439)	(\$1,437)	(\$1,436)	(\$1,438)
McFadden Ridge	(\$676)	(\$671)	(\$670)	(\$670)	(\$671)
Marengo	(\$2,241)	(\$2,224)	(\$2,222)	(\$2,221)	(\$2,224)
Marengo II	(\$864)	(\$858)	(\$857)	(\$857)	(\$858)
Mountain Wind Power	(\$153)	(\$151)	(\$151)	(\$151)	(\$151)
Mountain Wind Power II	\$321	\$319	\$318	\$318	\$319
Seven Mile Hill I	(\$3,015)	(\$2,993)	(\$2,990)	(\$2,988)	(\$2,992)
Seven Mile Hill II	(\$592)	(\$587)	(\$587)	(\$586)	(\$587)
Top of the World	\$1,526	\$1,515	\$1,514	\$1,512	\$1,515
Pioneer Wind Park I QF	(\$1,873)	(\$1,859)	(\$1,857)	(\$1,856)	(\$1,859)
Latigo Wind Park QF	\$52	\$52	\$52	\$52	\$52
Pavant II Solar QF	(\$1,064)	(\$1,057)	(\$1,056)	(\$1,055)	(\$1,056)
New 1100 MW WY Wind Proposal	(\$38,352)	(\$38,072)	(\$38,037)	(\$38,009)	(\$38,068)
Black Cap Solar	\$19	\$19	\$19	\$19	\$19
Adams Solar QF	\$81	\$81	\$81	\$81	\$81
Bear Creek Solar QF	\$156	\$156	\$156	\$156	\$156
Bly Solar QF	\$260	\$260	\$260	\$260	\$260
Elbe Solar QF	\$130	\$130	\$130	\$130	\$130
Enterprise Solar QF	(\$7,873)	(\$7,873)	(\$7,873)	(\$7,873)	(\$7,873)
Pavant Solar QF	(\$5,639)	(\$5,639)	(\$5,639)	(\$5,639)	(\$5,639)
OSIP_2010	\$130	\$130	\$130	\$130	\$130
OSIP_2011	\$1,244	\$1,244	\$1,244	\$1,244	\$1,244
OSIP_2012	\$787	\$787	\$787	\$787	\$787
OSIP_2013	\$918	\$918	\$918	\$918	\$918
OSIP_2014	\$581	\$581	\$581	\$581	\$581
OSIP_2015	\$220	\$220	\$220	\$220	\$220
OSIP_2016	\$105	\$105	\$105	\$105	\$105
OSIP_2017	\$27	\$27	\$27	\$27	\$27

## PacifiCorp - Oregon 2019-2023 RPS Implementation Plan Attachment E - Summary of RPS Incremental Costs by Resource

Scenario 3: Oct 12, 2016 OFPC Scenario Low Gas CPP A 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	(\$602)	(\$598)	(\$598)	(\$597)	(\$598)
Campbell Hill-Three Buttes	\$1,561	\$1,549	\$1,548	\$1,547	\$1,549
Dunlap I	(\$1,246)	(\$1,237)	(\$1,235)	(\$1,235)	(\$1,236)
Glenrock	(\$534)	(\$530)	(\$529)	(\$529)	(\$530)
Glenrock III	(\$99)	(\$98)	(\$98)	(\$98)	(\$98)
Goodnoe Hills	\$1,901	\$1,887	\$1,885	\$1,884	\$1,887
High Plains	(\$30)	(\$30)	(\$30)	(\$30)	(\$30)
McFadden Ridge	(\$272)	(\$270)	(\$269)	(\$269)	(\$270)
Marengo	(\$716)	(\$711)	(\$710)	(\$710)	(\$711)
Marengo II	(\$80)	(\$79)	(\$79)	(\$79)	(\$79)
Mountain Wind Power	\$270	\$268	\$268	\$268	\$268
Mountain Wind Power II	\$845	\$839	\$838	\$837	\$839
Seven Mile Hill I	(\$1,501)	(\$1,490)	(\$1,488)	(\$1,487)	(\$1,490)
Seven Mile Hill II	(\$296)	(\$294)	(\$294)	(\$293)	(\$294)
Top of the World	\$3,229	\$3,205	\$3,202	\$3,200	\$3,205
Pioneer Wind Park I QF	(\$475)	(\$471)	(\$471)	(\$471)	(\$471)
Latigo Wind Park QF	\$770	\$765	\$764	\$763	\$765
Pavant II Solar QF	(\$450)	(\$447)	(\$447)	(\$446)	(\$447)
New 1100 MW WY Wind Proposal	(\$12,361)	(\$12,270)	(\$12,259)	(\$12,250)	(\$12,269)
Black Cap Solar	\$64	\$64	\$64	\$64	\$64
Adams Solar QF	\$517	\$517	\$517	\$517	\$517
Bear Creek Solar QF	\$610	\$610	\$610	\$610	\$610
Bly Solar QF	\$654	\$654	\$654	\$654	\$654
Elbe Solar QF	\$566	\$566	\$566	\$566	\$566
Enterprise Solar QF	(\$4,827)	(\$4,827)	(\$4,827)	(\$4,827)	(\$4,827)
Pavant Solar QF	(\$3,767)	(\$3,767)	(\$3,767)	(\$3,767)	(\$3,767)
OSIP_2010	\$131	\$131	\$131	\$131	\$131
OSIP_2011	\$1,266	\$1,266	\$1,266	\$1,266	\$1,266
OSIP_2012	\$814	\$814	\$814	\$814	\$814
OSIP_2013	\$963	\$963	\$963	\$963	\$963
OSIP_2014	\$619	\$619	\$619	\$619	\$619
OSIP_2015	\$233	\$233	\$233	\$233	\$233
OSIP_2016	\$109	\$109	\$109	\$109	\$109
OSIP_2017	\$28	\$28	\$28	\$28	\$28

## PacifiCorp - Oregon 2019-2023 RPS Implementation Plan Attachment E - Summary of RPS Incremental Costs by Resource

### Scenario 4: Oct 12, 2016 OFPC Scenario Med Gas CPP A Fuel Curve

	2019	2020	2021	2022	2023
<b>Resource</b>	<b>Levelized Incremental Cost (\$000)</b>	<b>Levelized Incremental Cost (\$000)</b>	<b>Levelized Incremental Cost (\$000)</b>	<b>Levelized Incremental Cost (\$000)</b>	<b>Levelized Incremental Cost (\$000)</b>
Blundell II	(\$638)	(\$633)	(\$632)	(\$632)	(\$633)
Campbell Hill-Three Buttes	\$1,458	\$1,447	\$1,446	\$1,445	\$1,447
Dunlap I	(\$1,602)	(\$1,591)	(\$1,589)	(\$1,588)	(\$1,590)
Glenrock	(\$797)	(\$791)	(\$790)	(\$789)	(\$791)
Glenrock III	(\$201)	(\$199)	(\$199)	(\$199)	(\$199)
Goodnoe Hills	\$1,794	\$1,781	\$1,780	\$1,778	\$1,781
High Plains	(\$311)	(\$308)	(\$308)	(\$308)	(\$308)
McFadden Ridge	(\$352)	(\$349)	(\$349)	(\$348)	(\$349)
Marengo	(\$1,014)	(\$1,006)	(\$1,005)	(\$1,005)	(\$1,006)
Marengo II	(\$234)	(\$232)	(\$232)	(\$232)	(\$232)
Mountain Wind Power	\$206	\$204	\$204	\$204	\$204
Mountain Wind Power II	\$765	\$759	\$759	\$758	\$759
Seven Mile Hill I	(\$1,798)	(\$1,785)	(\$1,783)	(\$1,782)	(\$1,784)
Seven Mile Hill II	(\$354)	(\$351)	(\$351)	(\$351)	(\$351)
Top of the World	\$2,999	\$2,977	\$2,975	\$2,972	\$2,977
Pioneer Wind Park I QF	(\$703)	(\$698)	(\$697)	(\$696)	(\$697)
Latigo Wind Park QF	\$655	\$650	\$649	\$649	\$650
Pavant II Solar QF	(\$549)	(\$545)	(\$545)	(\$544)	(\$545)
New 1100 MW WY Wind Proposal	(\$18,725)	(\$18,588)	(\$18,571)	(\$18,557)	(\$18,586)
Black Cap Solar	\$59	\$59	\$59	\$59	\$59
Adams Solar QF	\$465	\$465	\$465	\$465	\$465
Bear Creek Solar QF	\$556	\$556	\$556	\$556	\$556
Bly Solar QF	\$607	\$607	\$607	\$607	\$607
Elbe Solar QF	\$514	\$514	\$514	\$514	\$514
Enterprise Solar QF	(\$5,269)	(\$5,269)	(\$5,269)	(\$5,269)	(\$5,269)
Pavant Solar QF	(\$4,039)	(\$4,039)	(\$4,039)	(\$4,039)	(\$4,039)
OSIP_2010	\$131	\$131	\$131	\$131	\$131
OSIP_2011	\$1,264	\$1,264	\$1,264	\$1,264	\$1,264
OSIP_2012	\$811	\$811	\$811	\$811	\$811
OSIP_2013	\$958	\$958	\$958	\$958	\$958
OSIP_2014	\$614	\$614	\$614	\$614	\$614
OSIP_2015	\$231	\$231	\$231	\$231	\$231
OSIP_2016	\$108	\$108	\$108	\$108	\$108
OSIP_2017	\$28	\$28	\$28	\$28	\$28



## PacifiCorp - Oregon 2019-2023 RPS Implementation Plan Attachment E - Summary of RPS Incremental Costs by Resource

Scenario 5: Oct 12, 2016 OFPC Scenario High Gas CPP B 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	-832.05	-825.97	-825.21	-824.60	-825.89
Campbell Hill-Three Buttes	766.65	761.05	760.35	759.78	760.97
Dunlap I	-3023.77	-3001.68	-2998.93	-2996.70	-3001.38
Glenrock	-1881.04	-1867.31	-1865.59	-1864.20	-1867.12
Glenrock III	-619.99	-615.46	-614.90	-614.44	-615.40
Goodnoe Hills	1203.51	1194.72	1193.62	1192.74	1194.60
High Plains	-1449.20	-1438.62	-1437.30	-1436.22	-1438.47
McFadden Ridge	-675.89	-670.95	-670.34	-669.84	-670.89
Marengo	-2240.77	-2224.40	-2222.36	-2220.71	-2224.18
Marengo II	-864.30	-857.99	-857.21	-856.57	-857.91
Mountain Wind Power	-152.57	-151.46	-151.32	-151.21	-151.44
Mountain Wind Power II	320.92	318.57	318.28	318.04	318.54
Seven Mile Hill I	-3014.68	-2992.66	-2989.92	-2987.69	-2992.37
Seven Mile Hill II	-591.52	-587.20	-586.66	-586.23	-587.14
Top of the World	1526.06	1514.92	1513.53	1512.40	1514.77
Pioneer Wind Park I QF	-1872.68	-1859.00	-1857.30	-1855.91	-1858.82
Latigo Wind Park QF	52.21	51.83	51.78	51.75	51.83
Pavant II Solar QF	-1064.29	-1056.52	-1055.55	-1054.77	-1056.42
New 1100 MW WY Wind Proposal	-38352.04	-38071.94	-38037.02	-38008.69	-38068.13
Black Cap Solar	18.62	18.62	18.62	18.62	18.62
Adams Solar QF	80.94	80.94	80.94	80.94	80.94
Bear Creek Solar QF	156.12	156.12	156.12	156.12	156.12
Bly Solar QF	259.63	259.63	259.63	259.63	259.63
Elbe Solar QF	130.04	130.04	130.04	130.04	130.04
Enterprise Solar QF	-7872.94	-7872.94	-7872.94	-7872.94	-7872.94
Pavant Solar QF	-5638.69	-5638.69	-5638.69	-5638.69	-5638.69
OSIP_2010	129.71	129.71	129.71	129.71	129.71
OSIP_2011	\$1,244	\$1,244	\$1,244	\$1,244	\$1,244
OSIP_2012	\$787	\$787	\$787	\$787	\$787
OSIP_2013	\$918	\$918	\$918	\$918	\$918
OSIP_2014	\$581	\$581	\$581	\$581	\$581
OSIP_2015	\$220	\$220	\$220	\$220	\$220
OSIP_2016	\$105	\$105	\$105	\$105	\$105
OSIP_2017	\$27	\$27	\$27	\$27	\$27

## PacifiCorp - Oregon 2019-2023 RPS Implementation Plan Attachment E - Summary of RPS Incremental Costs by Resource

Scenario 6: Oct 12, 2016 OFPC Scenario Low Gas CPP B 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	(\$600)	-595.34	-594.80	-594.35 #	-595.28
Campbell Hill-Three Buttes	\$1,573	1561.18	1559.74	1558.58 #	1561.02
Dunlap I	(\$1,234)	-1224.69	-1223.56	-1222.65 #	-1224.56
Glenrock	(\$524)	-519.87	-519.39	-519.01 #	-519.82
Glenrock III	(\$95)	-94.27	-94.19	-94.12 #	-94.26
Goodnoe Hills	\$1,909	1895.33	1893.59	1892.18 #	1895.14
High Plains	(\$20)	-19.90	-19.88	-19.87 #	-19.90
McFadden Ridge	(\$269)	-266.68	-266.43	-266.24 #	-266.65
Marengo	(\$705)	-699.84	-699.20	-698.68 #	-699.77
Marengo II	(\$74)	-73.28	-73.22	-73.16 #	-73.28
Mountain Wind Power	\$275	273.10	272.85	272.64 #	273.07
Mountain Wind Power II	\$851	844.84	844.07	843.44 #	844.76
Seven Mile Hill I	(\$1,490)	-1478.97	-1477.61	-1476.51 #	-1478.82
Seven Mile Hill II	(\$294)	-291.86	-291.60	-291.38 #	-291.83
Top of the World	\$3,252	3228.72	3225.76	3223.35 #	3228.40
Pioneer Wind Park I QF	(\$461)	-457.41	-456.99	-456.65 #	-457.37
Latigo Wind Park QF	\$778	772.22	771.51	770.93 #	772.14
Pavant II Solar QF	(\$444)	-440.70	-440.30	-439.97 #	-440.66
New 1100 MW WY Wind Proposal	(\$12,226)	-12136.87	-12125.74	-12116.71 #	-12135.66
Black Cap Solar	\$65	65.21	65.21	65.21 #	65.21
Adams Solar QF	\$526	526.48	526.48	526.48 #	526.48
Bear Creek Solar QF	\$620	620.27	620.27	620.27 #	620.27
Bly Solar QF	\$663	662.73	662.73	662.73 #	662.73
Elbe Solar QF	\$576	575.57	575.57	575.57 #	575.57
Enterprise Solar QF	(\$4,789)	-4788.81	-4788.81	-4788.81 #	-4788.81
Pavant Solar QF	(\$3,743)	-3743.42	-3743.42	-3743.42 #	-3743.42
OSIP_2010	\$131	131.15	131.15	131.15 #	131.15
OSIP_2011	\$1,267	\$1,267	\$1,267	\$1,267 0	\$1,267
OSIP_2012	\$814	\$814	\$814	\$814 0	\$814
OSIP_2013	\$964	\$964	\$964	\$964 0	\$964
OSIP_2014	\$620	\$620	\$620	\$620 0	\$620
OSIP_2015	\$233	\$233	\$233	\$233 0	\$233
OSIP_2016	\$109	\$109	\$109	\$109 0	\$109
OSIP_2017	\$29	\$29	\$29	\$29 0	\$29

## PacifiCorp - Oregon 2019-2023 RPS Implementation Plan Attachment E - Summary of RPS Incremental Costs by Resource

Scenario 7: Nov 8, 2017 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	(\$603)	(\$598)	(\$598)	(\$597)	(\$598)
Campbell Hill-Three Buttes	\$1,597	\$1,585	\$1,584	\$1,583	\$1,585
Dunlap I	(\$1,433)	(\$1,422)	(\$1,421)	(\$1,420)	(\$1,422)
Glenrock	(\$665)	(\$660)	(\$660)	(\$659)	(\$660)
Glenrock III	(\$150)	(\$149)	(\$149)	(\$148)	(\$149)
Goodnoe Hills	\$1,901	\$1,887	\$1,885	\$1,884	\$1,887
High Plains	(\$173)	(\$171)	(\$171)	(\$171)	(\$171)
McFadden Ridge	(\$312)	(\$310)	(\$310)	(\$309)	(\$310)
Marengo	(\$862)	(\$856)	(\$855)	(\$855)	(\$856)
Marengo II	(\$157)	(\$156)	(\$156)	(\$155)	(\$156)
Mountain Wind Power	\$270	\$268	\$268	\$268	\$268
Mountain Wind Power II	\$845	\$839	\$838	\$837	\$839
Seven Mile Hill I	(\$1,650)	(\$1,638)	(\$1,636)	(\$1,635)	(\$1,638)
Seven Mile Hill II	(\$325)	(\$323)	(\$322)	(\$322)	(\$323)
Top of the World	\$3,288	\$3,264	\$3,261	\$3,259	\$3,264
Pioneer Wind Park I QF	(\$543)	(\$540)	(\$539)	(\$539)	(\$539)
Latigo Wind Park QF	\$741	\$735	\$735	\$734	\$735
Pavant II Solar QF	(\$478)	(\$475)	(\$474)	(\$474)	(\$475)
New 1100 MW WY Wind Proposal	(\$15,524)	(\$15,410)	(\$15,396)	(\$15,385)	(\$15,409)
Black Cap Solar	\$66	\$66	\$66	\$66	\$66
Adams Solar QF	\$560	\$560	\$560	\$560	\$560
Bear Creek Solar QF	\$655	\$655	\$655	\$655	\$655
Bly Solar QF	\$693	\$693	\$693	\$693	\$693
Elbe Solar QF	\$609	\$609	\$609	\$609	\$609
Enterprise Solar QF	(\$4,846)	(\$4,846)	(\$4,846)	(\$4,846)	(\$4,846)
Pavant Solar QF	(\$3,778)	(\$3,778)	(\$3,778)	(\$3,778)	(\$3,778)
OSIP_2010	\$131	\$131	\$131	\$131	\$131
OSIP_2011	\$1,268	\$1,268	\$1,268	\$1,268	\$1,268
OSIP_2012	\$815	\$815	\$815	\$815	\$815
OSIP_2013	\$965	\$965	\$965	\$965	\$965
OSIP_2014	\$620	\$620	\$620	\$620	\$620
OSIP_2015	\$233	\$233	\$233	\$233	\$233
OSIP_2016	\$109	\$109	\$109	\$109	\$109
OSIP_2017	\$28	\$28	\$28	\$28	\$28

**PacifiCorp  
Renewable Portfolio Standard Oregon  
Implementation Plan  
2019-2023**

**Attachment F**

**Scenarios 1 - 7**

**Summary of RPS Incremental Cost of  
Compliance**

PacifiCorp Oregon - 2019-2023 RPS Implementation Plan

Revenue Requirement Workpaper

**Scenario 1: 2017 IRP Base Case - October 2016 OFPC**

	Incremental Costs			4% Annual Revenue Requirement	Percent of Annual Revenue Requirement
	Bundled (\$000s)	Unbundled (\$000s)	Total (\$000s)		
2019	\$2,093	\$100	\$2,194	\$ 50,171	0.17%
2020	\$1,979	\$100	\$2,079	\$ 49,788	0.17%
2021	(\$10,884)	\$100	(\$10,784)	\$ 49,530	-0.87%
2022	(\$14,421)	\$100	(\$14,322)	\$ 49,455	-1.16%
2023	(\$14,557)	\$99	(\$14,457)	\$ 49,443	-1.17%

**Scenario 2: 4-04-17 IRP Filing OFPC Scenario High Gas CPP A**

	Incremental Costs			4% Annual Revenue Requirement	Percent of Annual Revenue Requirement
	Bundled (\$000s)	Unbundled (\$000s)	Total (\$000s)		
2019	(\$12,614)	\$100	(\$12,514)	\$ 50,171	-1.00%
2020	(\$18,190)	\$100	(\$18,090)	\$ 49,788	-1.45%
2021	(\$34,039)	\$100	(\$33,940)	\$ 49,530	-2.74%
2022	(\$45,141)	\$100	(\$45,042)	\$ 49,455	-3.64%
2023	(\$45,155)	\$99	(\$45,055)	\$ 49,443	-3.65%

**Scenario 3: 4-04-17 IRP Filing OFPC Scenario Low Gas CPP A**

	Incremental Costs			4% Annual Revenue Requirement	Percent of Annual Revenue Requirement
	Bundled (\$000s)	Unbundled (\$000s)	Total (\$000s)		
2019	\$4,849	\$100	\$4,950	\$ 50,171	0.39%
2020	\$5,801	\$100	\$5,902	\$ 49,788	0.47%
2021	(\$4,988)	\$100	(\$4,889)	\$ 49,530	-0.39%
2022	(\$6,588)	\$100	(\$6,489)	\$ 49,455	-0.52%
2023	(\$6,764)	\$99	(\$6,665)	\$ 49,443	-0.54%

PacifiCorp Oregon - 2019-2023 RPS Implementation Plan

Revenue Requirement Workpaper

**Scenario 4: 4-04-17 IRP Filing OFPC Scenario Med Gas CPP A**

	Incremental Costs			4% Annual Revenue Requirement	Percent of Annual Revenue Requirement
	Bundled (\$000s)	Unbundled (\$000s)	Total (\$000s)		
2019	\$1,851	\$100	\$1,951	\$ 50,171	0.16%
2020	\$1,650	\$100	\$1,750	\$ 49,788	0.14%
2021	(\$11,207)	\$100	(\$11,107)	\$ 49,530	-0.90%
2022	(\$14,850)	\$100	(\$14,750)	\$ 49,455	-1.19%
2023	(\$14,984)	\$99	(\$14,884)	\$ 49,443	-1.20%

**Scenario 5: 4-04-17 IRP Filing OFPC Scenario High Gas CPP B**

	Incremental Costs			4% Annual Revenue Requirement	Percent of Annual Revenue Requirement
	Bundled (\$000s)	Unbundled (\$000s)	Total (\$000s)		
2019	(\$12,614)	\$100	(\$12,514)	\$ 50,171	-1.00%
2020	(\$18,190)	\$100	(\$18,090)	\$ 49,788	-1.45%
2021	(\$34,039)	\$100	(\$33,940)	\$ 49,530	-2.74%
2022	(\$45,141)	\$100	(\$45,042)	\$ 49,455	-3.64%
2023	(\$45,155)	\$99	(\$45,055)	\$ 49,443	-3.65%

**Scenario 6: 4-04-17 IRP Filing OFPC Scenario Low Gas CPP B**

	Incremental Costs			4% Annual Revenue Requirement	Percent of Annual Revenue Requirement
	Bundled (\$000s)	Unbundled (\$000s)	Total (\$000s)		
2019	\$5,024	\$100	\$5,124	\$ 50,171	0.41%
2020	\$6,038	\$100	\$6,138	\$ 49,788	0.49%
2021	(\$4,780)	\$100	(\$4,680)	\$ 49,530	-0.38%
2022	(\$6,313)	\$100	(\$6,213)	\$ 49,455	-0.50%
2023	(\$6,489)	\$99	(\$6,390)	\$ 49,443	-0.52%

PacifiCorp Oregon - 2019-2023 RPS Implementation Plan

Revenue Requirement Workpaper

**Scenario 7: November 8 2017 OFPC Fuel Curve**

	Incremental Costs			4% Annual Revenue Requirement	Percent of Annual Revenue Requirement
	Bundled (\$000s)	Unbundled (\$000s)	Total (\$000s)		
2019	\$3,998	\$100	\$4,098	\$ 50,171	0.33%
2020	\$4,566	\$100	\$4,667	\$ 49,788	0.37%
2021	(\$7,655)	\$100	(\$7,556)	\$ 49,530	-0.61%
2022	(\$10,139)	\$100	(\$10,039)	\$ 49,455	-0.81%
2023	(\$10,291)	\$99	(\$10,191)	\$ 49,443	-0.82%

**Sensitivity - Annual Unbundled RECs Maximized (20%) - IRP BaseOctober 2016 OFPC**

	Incremental Costs			4% Annual Revenue Requirement	Percent of Annual Revenue Requirement
	Bundled (\$000s)	Unbundled (\$000s)	Total (\$000s)		
2019	\$1,756	\$355	\$2,111	\$ 50,171	0.17%
2020	\$1,253	\$471	\$1,723	\$ 49,788	0.14%
2021	(\$8,707)	\$468	(\$8,239)	\$ 49,530	-0.67%
2022	(\$11,537)	\$468	(\$11,069)	\$ 49,455	-0.90%
2023	(\$11,645)	\$469	(\$11,176)	\$ 49,443	-0.90%