ITEM NO. 2

PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: December 6, 2016

REGULAR X **CONSENT** ____ **EFFECTIVE DATE** **January 1, 2017**

DATE: November 28, 2016

TO: Public Utility Commission

FROM: Ming Peng mp.

THROUGH: Jason Eisdorfer and Marc Hellman

SUBJECT: PORTLAND GENERAL ELECTRIC: (Docket No. ADV 391/Advice No. 16-15) Establishes the Tariff Schedule 146 Colstrip Power Plant Operating Life Adjustment to implement into rates the Company's share of the revenue requirement effect of the change in the Colstrip Power Plant Unit 3 and 4, with a requested effective date of January 1, 2017.

STAFF RECOMMENDATION:

Staff recommends that the Commission approve Portland General Electric Company's (PGE or Company) requested changes to Tariff Schedule 146 (Tariff), Colstrip Power Plant Unit 3 and 4 (Colstrip) Operating Life Adjustment, beginning on January 1, 2017, and ending on December 31, 2030, subject to the following conditions and reporting requirements:

1. PGE will submit a compliance filing annually to update Tariff Schedule 146 with rates calculated in accordance with the methodology included in PGE's Advice 16-15.

2. If any new applicable laws, rules, or Commission orders are enacted or issued within the next 14-year depreciation period, PGE will comply with all applicable new mandates, and submit applications to the Commission for review and approval before updating the calculations for depreciation, revenue requirement, and corresponding tariffs.

3. For any potential capital additions in decommissioning costs ("decommissioning" means removing a power plant from service), PGE will

submit the calculations for the incremental rate impacts to the Commission for review and approval.[1]

4. In the event PGE continues to have an ownership share of the Colstrip plant(s) after December 31, 2029,[2] and the plant(s) continue operation past that date, PGE will provide to the Commission, by no later than March 31 of each subsequent year, an informational notice stating whether PGE retains ownership of the plant(s) and an estimate of that year's forecasted annual net economic value of PGE's share of Colstrip.

5. After Colstrip is fully depreciated and before the plant is closed, subject to the provisions included in Senate Bill 1547, Section 1(4), PGE should pass the ongoing costs and benefits, if any, to customers during the period January 1, 2031 through December 31, 2035.[3]

6. If the Company decides to sell some or all of its fractional ownership in the future, PGE must file with the Commission an application for approval of this transaction in accordance with applicable statutes and rules. In reviewing such a future filing, Staff will consider the net gain or net loss of the sale of the plant for allocation to utility customers. In such a filing, PGE will need to estimate the impact of the sale to affected customers, the bill changes per month on Schedule 146 as a result of the property sales, and an overall annual rate impact.

DISCUSSION:

Issue

Whether the Company's Advice No. 16-15, establishing PGE's Tariff Schedule 146 to shorten the Colstrip's Operating Life Expectancy, is consistent with applicable law and is in its customers' interest, such that the Commission should approve the filing.

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[1] An example of a law that could trigger this condition is the new Coal Combustion Residual (CCR) requirements the EPA issued in 2015 on Colstrip 3 & 4.

[2] *See* Senate Bill 1547. Coal plants are not to be used to serve Oregon customers beginning in 2030, although depreciation costs are included in rates through the year 2030. Colstrip though could be treated differently than other coal plants and have a five-year extension even after being fully depreciated.

[3] S.B. 1547, as enacted, provides PGE the exclusive option to provide the economic value to customers even though PGE customers have fully-paid for the plant through 2030. In Staff's view this treatment of plant, of the utility having the exclusive optionality, is inconsistent with traditional ratemaking practices.

Applicable Law

Senate Bill 1547, enacted by the 2016 Legislature requires each electric company providing electricity to retail electricity consumers located in this state to eliminate coal-fired resources from electric company's electricity supply by January 1, 2030.[4] *See* Attachment A. Senate Bill 1547, ELIMINATION OF COAL FROM ELECTRICITY SUPPLY.

Section 1(3) compels the Commission to adjust the depreciation schedule of an electric company's coal-fired resource so that the coal-fired resource is fully depreciated on or before December 31, 2030, if (1) the electric company is the minority owner of no more than one coal-fired resource with no more than four generating units, and (2) the electric company serves at least 800,000 retail electricity consumers and its service territory is located only in Oregon. PGE is the only utility that meets the requirements of this section.

Section 2 of the Bill provides the Commission with authority to allocate the net gain or loss from the sale of a coal-fired resource to customers of an electric company if that electric company makes retail sales to 25,000 or more retail electricity consumers in Oregon.

ORS 757.140(1) requires that "Every public utility shall carry a proper and adequate depreciation account. The Public Utility Commission shall ascertain and determine the proper and adequate rates of depreciation of the several classes of property of each public utility. The rates shall be such as will provide the amounts required over and above the expenses of maintenance, to keep such property in a state of efficiency corresponding to the progress of the industry. Each public utility shall conform its depreciation accounts to the rates so ascertained and determined by the commission. The commission may make changes in such rates of depreciation from time to time as the commission may find to be necessary."

OAR 860-022-0025(2) and OAR 860-022-0030(1) require that each energy utility changing existing tariffs or schedules or increasing rates in those schedules must indicate the change in rates and the number of customers affected.

ORS 757.210 (1)(b) further provides that "As used in this subsection, automatic adjustment clause means a provision of a rate schedule that provides for rate increases or decreases or both, without prior hearing, reflecting increases or decreases or both in costs incurred, taxes paid to units of government or revenues earned by a utility and that is subject to review by the commission at least once every two years."

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[4] S.B. 1547, 78th Leg., Reg. Sess. (Or 2016) ("SB 1547") at Section 1(2).

In Commission Order No. 14-297 (Docket UM 1679), the Commission adopted for PGE the changes in depreciation parameters (i.e., assets Survivor Curve-Projection Life, Net Salvage Ratio) by FERC account. In its Order, the Commission required the Company to implement the depreciation, amortization, and net salvage rates proposed in the UM 1679 parties' stipulation as of January 1, 2015. *See also* Order No. 14-442 (the general rate case order issued in Docket UE 283).

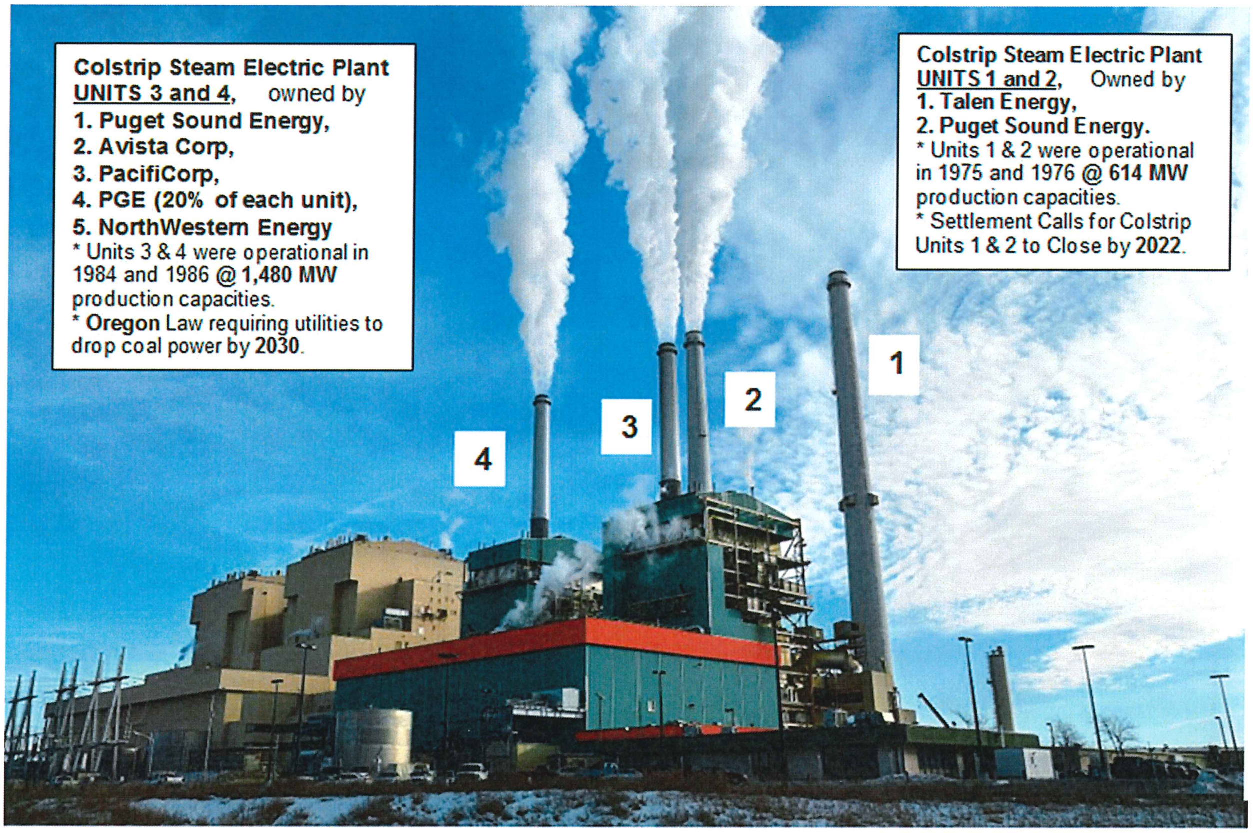
<u>Analysis</u>

Background

Pursuant to SB 1547 Section 1, the Company filed its Advice No. 16-15 on October 12, 2016, requesting establishment of the Tariff Schedule 146 Colstrip Power Plant Operating Life Adjustment to implement the rates for PGE's share of the revenue requirement effect of the change in the Colstrip Power Plant Unit 3 and 4 and associated common facilities, with a requested effective date of January 1, 2017. If allowed to go into effect, the Tariff will increase PGE's revenues by $5.6 million, which translates to a 0.3 percent increase on current rates, inclusive of public purpose charges.

PGE's filing is to update the accelerated depreciation date and it also provides the calculations for incremental cost impacts on depreciation, revenue requirements, and electric tariffs. PGE also proposes an Automatic Adjustment Clause (AAC) to implement the revenue requirement effects, such that the depreciable capital investment of the coal-fired resource would be fully depreciated on or before December 31, 2030. This would be consistent with SB 1547 Section 1(3). The Company further states that it "will update Schedule 146, effective January 1, 2018, and each year thereafter, to account for updates to the load forecast and decommissioning costs, among other factors."

The Colstrip coal plant in Montana serves utility customers across the Pacific. PGE owns 20 percent each of Colstrip Units 3 and 4. At 296 net megawatt of capacity, PGE's power can light nearly 300,000 homes. The following illustration provides additional information on this topic.



Colstrip Power Plants 1-4 from right to left

On October 25, 2016, the Industrial Customers of Northwest Utilities (ICNU) filed comments recommending that the Commission reject PGE's Advice Filing 16-15. Very generally stated, ICNU's primary points are: it does not support single-issue ratemaking; it does not support the use of an AAC; and, because SB 1547 does not prescribe the timing of PGE's filing, ICNU recommends the Commission take this issue up during PGE's next rate case or depreciation case filing to adjust Colstrip's depreciable life. Staff addresses ICNU's concerns in its Staff Review.

Staff Review
Staff's analysis consists of the following three topics:

1. The starting period for accelerated depreciation;
2. PGE's AAC filing and ICNU's single-issue ratemaking concern; and
3. The incremental rate impacts on depreciation, revenue requirement, and the effect of customers' rates

1. The starting period for accelerated depreciation

As stated, ICNU recommends the Commission not approve the filing for several reasons. One issue is ICNU's argument that PGE has not shown that it either cannot absorb the higher depreciation rates or wait to file the change in depreciation rates when the Company files its next rate case. On the latter alternative, ICNU states that the general rate case option would allow the Commission to undertake a full and complete review of all of PGE's costs, not just higher depreciation rates.

Staff does not support ICNU's recommendation for two reasons. First, the change in Colstrip's depreciation life comes from SB 1547. SB 1547 Section 1(3)(b) requires the Commission to allow PGE to adjust its depreciation schedule for Colstrip so that it is fully depreciated on or before December 31, 2030. Therefore PGE is responding to new law. As such, PGE should not be expected to bear those additional costs that are a direct result of SB 1547.

The second reason Staff does not support ICNU's recommendation is because of the notion of "generational equity." To start, it is not a question of *whether* the Commission will allow accelerated depreciation for Colstrip. It is a given under SB 1547 that the Colstrip plants need to be fully depreciated by the end of 2030. The question thus becomes *when* will the Commission allow such accelerated depreciation to commence?

The principle of generational equity dictates that it would be unfair to future rate payers to wait to implement the accelerated depreciation of Colstrip. In other words, accepting ICNU's recommendation would allow current customers to pay lower depreciation rates, with the unfair result that future customers would pay the higher rates required by Colstrip's accelerated depreciation. Staff supports implementing the change in plant depreciable lives now in order to lower the rate impact in cents per kWh terms.

To explain this point in greater detail, without accelerated depreciation, Colstrip will have 21 years "composite" remaining life ("composite" refers to the weighted average remaining life calculated by FERC accounts). Staff compared annual depreciation expense for a remaining life of: (a) 14 years if starting from 1/1/2017, (b) 13 years remaining if starting from 1/1/2018, and (c) 12 years remaining if starting from 1/1/2019. Staff found the annual depreciation expenses are different significantly. This is illustrated in the following table:

12/31/2016 Net Plant $	Remaining Life Year	Annual depr. Expense $	Annual depr. Increase $	Depr.Expense Increase %	Revenue Reqmt Increase $
165,409,002					
1/1/2019	12	13,784,083	7,603,389	123.0%	6,885,963
1/1/2018	13	12,723,769	6,543,075	105.9%	6,524,045
1/1/2017	14	11,814,929	5,634,234	91.2%	5,617,848
Current 2016	21	6,180,694	0	0%	0

Current annual depreciation expense, which is approximately $6.18 million per year, has 21 years remaining life. To start accelerated depreciation on January 1, 2017, means Colstrip would have 14 years remaining life, which translates to approximately $11.8 million annual depreciation expense. If the Commission delays the start of accelerated depreciation until January 1, 2018, Colstrip will have 13 years remaining life, and depreciation expense would be about $12.7 million per year. Finally, if the Commission waits until January 1, 2019, there will be 12 years remaining life, which results in a depreciation expense of approximately $13.8 million per year.

Based on the calculations above, it is clear that for any capital recovery or depreciation with a given plant termination date, the longer the wait to commence accelerating the depreciation, the shorter the payment term and the higher the pay rate (annual depreciation expenses). Therefore, Staff recommends starting accelerated depreciation as soon as possible, as PGE proposes with its requested effective date of January 1, 2017.

2. PGE's AAC filing and ICNU's single-issue ratemaking concern

PGE's application for an AAC in this filing is consistent with SB 1547 and is appropriate in the present circumstances.

An AAC under ORS 757.210 (1)(b) is a schedule that allows for rate increases or decreases or both, without a prior hearing. However, for tariff filing purposes, the rate change still, "is subject to review by the commission at least once every two years." ORS 757.210(1)(b). Therefore, as with all AACs, there will be opportunities for timely reviews of PGE's schedule with an AAC by the Commission.

Further, Staff believes that SB 1547's mandate for earlier elimination of coal-derived power in Oregon better answers ICNU's concern about single-issue ratemaking. As just stated above, because of generational equity concerns, recognizing the fact that it is not a question of *whether* to accelerate Colstrip's depreciation but *when* to do so, Staff recommends that the Commission allow the accelerated depreciation to commence now and not wait for PGE's next general rate case to conclude at a date in the future.

3. The incremental rate impacts on depreciation, revenue requirement, and the effect of customers' rates

SB 1547's accelerated depreciation requirements will have incremental rate impacts on: (1) depreciation, (2) revenue requirement, and (3) customer rates. Staff's analyses included each of the following steps.

Staff sent out 10 data requests to PGE as well as participated in phone conferences with PGE's staff on the effect of its application on depreciation, revenue requirement, and its customers' rates.

(1) Rate impact on depreciation

In its filing, PGE applied depreciation rates as prescribed in Order No. 15-356 (UE 294) to determine the Colstrip net plant balance as of December 31, 2016. PGE then calculated the depreciation expense under the revised depreciable end of life date.

As stated, Colstrip currently has 21 years composite remaining life (weighted average remaining life calculated by FERC accounts). With accelerated depreciation, PGE will shorten Colstrip's remaining life to 14 years with rates effective as of January 1, 2017. Staff verified PGE's accelerated depreciation calculation and requested for the historic plant balance data (Attachment B. Table 2. 2012 to 2016 Plant Balances). Staff confirmed that PGE's accelerated depreciation calculations over the period of January 1, 2017 to December 31, 2030 meet the Commission requirements.

This accelerated depreciation will shorten the Colstrip composite Remaining Service Life by seven years (i.e. from 21 years remaining to 14 years – *see* Attachment B. Table 3, the composite remaining life calculation for Colstrip Unit 3 & 4). The result shows that the depreciation expense will be $11.8 million per year, an increase from current the $6.18 million per year (which is an increase of approximately $5.6 million per year). *See* Attachment B. Table 1, incremental depreciation annual expense (1) depreciation@ end life of 2030, and Incremental depreciation annual expense (2) 2016 annual depreciation.

(2) Rate impact on Revenue Requirement

Under cost of service regulation, Revenue Requirement that measured by cost of service, refers to the revenues the utility must earn to recover the cost of providing service and to earn a reasonable return on its investment. As a result of the depreciation expense increase, PGE's Revenue Requirement will be increased by $5.6 million per year. *See* Attachment B. Table 5. 2017 Incremental Revenue Requirement - Colstrip Accelerated Depreciation. PGE's Accumulated Depreciation (the cost of the investment in a gross plant that is recovered through the cost-of-service as Depreciation Expense) has been correctly deducted from rate base in the revenue requirement model. Staff verified the revenue requirement model item-by-item, and confirmed that PGE's calculations meet the Commission's requirements.

(3) Rate impact on customers

Staff reviewed the Company's rate calculations of Incremental Electric Tariff for each of 15 sub-schedules under the Schedule 146 (Attachment Table 6, Incremental Electric Tariff, Calculation of Schedule 146 Prices), including base calculation and proposed calculation, base price and proposed price as well as how the customer numbers would be affected. *See* Attachment B. Table 4. ESTIMATED EFFECT ON CONSUMERS' TOTAL ELECTRIC BILLS.

Depreciation is one of the Company's largest expenses in the revenue requirement. An increase to depreciation expense, with a corresponding increase to revenue requirement, PGE's customer rates will increase accordingly. Schedule 7 under the Schedule 146, shows that a typical residential customer consuming 840 kWh monthly will see a bill increase of approximately $0.30. *See* Attachment B. Table 7. The Schedule 146 rates will increase for each sub-schedule. *See* Attachment B. Table 6.

Please note that Colstrip units 3 and 4 will "be eliminated" on January 1, 2030, at which time the site may or may not be decommissioned. This filing only deals with Colstrip accelerated depreciation calculation and costs associated with revenue requirement, and electric tariff, not including the plant decommissioning costs. In PGE's response to Staff's information request No. 7, the Company stated that it "currently plans to include a revised updated estimate of terminal decommissioning costs in PGE's next depreciation study, which we are required to complete no later than the end of 2018."

Conclusion

Having reviewed and analyzed the PGE application as indicated above, given that the recovery of accelerated depreciation through Schedule 146 is subject to an automatic adjustment clause, Staff's prudence review focused on whether accelerated depreciation adjustments were calculated correctly. Schedule 146 rates, reflect the accelerated depreciation to be recovered from January 1, 2017 to December 31, 2030, have been correctly updated in the filed tariff sheets 146. Staff recommends that the Commission approve Docket No. ADV 391/Advice 16-15 filing and the methodology used to calculate new rates for Schedule 146.

PGE has reviewed this memo and has expressed no substantive concerns.

PROPOSED COMMISSION MOTION:

Approve, subject to Staff's recommended conditions and reporting requirements, PGE's requested changes to Schedule 146, to be effective January 1, 2017.

Attachment A. Senate Bill 1547, ELIMINATION OF COAL FROM ELECTRICITY SUPPLY

78th OREGON LEGISLATIVE ASSEMBLY--2016 Regular Session

Enrolled
Senate Bill 1547

Sponsored by Senator BEYER; Senators BATES, BURDICK, DEMBROW, DEVLIN, GELSER, HASS, MONNES ANDERSON, MONROE, RILEY, ROSENBAUM, SHIELDS, STEINER HAYWARD, Representatives VEGA PEDERSON, WILLIAMSON (Presession filed.)

CHAPTER ....

AN ACT

Relating to public utilities; creating new provisions; amending ORS 469A.005, 469A.020, 469A.052, 469A.055, 469A.060, 469A.075, 469A.100, 469A.120, 469A.135, 469A.140, 469A.145, 469A.210 and 757.375; repealing ORS 757.370; and declaring an emergency.

Be It Enacted by the People of the State of Oregon:

ELIMINATION OF COAL FROM ELECTRICITY SUPPLY

SECTION 1. (1) As used in this section:

(a) "Allocation of electricity" means, for the purpose of setting electricity rates, the costs and benefits associated with the resources used to provide electricity to an electric company's retail electricity consumers that are located in this state.

(b)(A) "Coal-fired resource" means a facility that uses coal-fired generating units, or that uses units fired in whole or in part by coal as feedstock, to generate electricity.

(B) "Coal-fired resource" does not include a facility generating electricity that is included as part of a limited duration wholesale power purchase made by an electric company for immediate delivery to retail electricity consumers that are located in this state for which the source of the power is not known.

(c) "Electric company" has the meaning given that term in ORS 757.600.

(d) "Retail electricity consumer" has the meaning given that term in ORS 757.600.

(2) On or before January 1, 2030, an electric company shall eliminate coal-fired resources from its allocation of electricity.

(3)(a) The Public Utility Commission shall adjust any schedule of depreciation approved by the commission for an electric company's coal-fired resource if:

(A) The electric company holds a minority ownership share in only one coal-fired resource, with no more than four generating units; and

(B) The electric company serves at least 800,000 retail electricity consumers and only retail electricity consumers that are located in this state.

(b) The adjusted depreciation schedule described in paragraph (a) of this subsection must require the coal-fired resource described in paragraph (a)(A) of this subsection to be fully depreciated on or before December 31, 2030.

(4) Notwithstanding subsections (2) and (3) of this section, for the number of years requested by the electric company, not to exceed five years after the coal-fired resource is fully

depreciated, the commission shall authorize an electric company described in subsection (3) of this section to include in the company's allocation of electricity the costs and benefits associated with the coal-fired resource described in subsection (3)(a)(A) of this section if:

(a) The electric company requests the commission to authorize the allocation of electricity; or

(b) The owners of the coal-fired resource agree to close the coal-fired resource on or before the date that is five years after the date the coal-fired resource is fully depreciated.

(5) For purposes of evaluating the prudence of an investment decision regarding a coal-fired resource made after the effective date of this 2016 Act, or an investment related to the continued operation of a coal-fired resource made after the effective date of this 2016 Act, the useful life of the coal-fired resource may not be considered to be any later than January 1, 2030, unless the commission determines otherwise.

(6) Notwithstanding ORS 757.355, this section does not prevent the full recovery of prudently incurred costs related to the decommissioning or remediation of a coal-fired resource or the closure of a coal-fired resource, at the time those costs are incurred.

SECTION 2. The Public Utility Commission may consider the net gain or net loss upon the sale of any coal-fired resource, as defined in section 1 of this 2016 Act, for allocation to the retail electricity consumers, as defined in ORS 757.600, of an electric company that makes sales of electricity to 25,000 or more retail electricity consumers in this state.

AMENDMENTS TO STATUTES REGULATING RENEWABLE PORTFOLIO STANDARDS
(Definitions)

SECTION 3. ORS 469A.005 is amended to read:

469A.005. As used in ORS 469A.005 to 469A.210:

(1) "Acquires service territory" does not include an acquisition by a city of a facility, plant, equipment or service territory within the boundaries of the city, pursuant to ORS 225.020 or city charter, if the city:

(a) Already owns, controls or operates an electric light and power system for supplying electricity to the inhabitants of the city and for general municipal purposes;

(b) Provides fair, just and reasonable compensation to the electric company whose service territory is acquired that:

(A) Gives consideration for the service territory rights and the cost of the facility, plant or equipment acquired and for depreciation, fair market value, reproduction cost and any other relevant factor; and

(B) Is based on the present value of the service territory rights and the facility, plant and equipment acquired, including the value of poles, wires, transformers and similar and related appliances necessarily required to provide electric service; and

(c) Pays any stranded costs obligation established pursuant to section 18 of this 2016 Act.

[*(1)*] **(2)** "Banked renewable energy certificate" means a bundled or unbundled renewable energy certificate that is not used by an electric utility or electricity service supplier to comply with a renewable portfolio standard in a calendar year, and that is carried forward for the purpose of compliance with a renewable portfolio standard in a subsequent year.

[*(2)*] **(3)** "BPA electricity" means electricity provided by the Bonneville Power Administration, including [*all*] electricity [*from*] **generated by** the Federal Columbia River Power System hydroelectric projects and [*other*] electricity acquired by the Bonneville Power Administration by contract.

[*(3)*] **(4)** "Bundled renewable energy certificate" means a renewable energy certificate for qualifying electricity that is acquired:

(a) By an electric utility or electricity service supplier by a trade, purchase or other transfer of electricity that includes the **renewable energy** certificate that was issued for the electricity; or

Attachment B.
Table 1. Incremental depreciation annual expense (1) depreciation@ end life of 2030

TABLE 1- Accelerated Depreciation due to SB 1547 requirement to be fully depreciated by 12/31/2030:							
	COLSTRIP		NEW END OF DERECIABLE LIFE (if acceleration begins 1/1/2017)				
Account	Estimated Plant Balance $ at 12/31/2016	Estimated Accum Reserve $ @ 12/31/2016	UM1679 IOWA Survivor Curves	UM1679 Equal Life Group, Projection Life (Year)	UM1679 Net Salvage Rate % (NS)	End of Life 2030 Annual Rate %	NEW End-of-Life 2030 Annual $ Calculation
311	116,386,107	98,246,863	S1.5	90	(0.05)	7.14%	1,711,325
312	233,495,232	174,513,777	R3	65	(0.05)	7.14%	5,046,873
314	73,963,641	43,668,494	S0.5	60	(0.05)	7.14%	2,428,095
315	23,761,009	19,439,041	R2.5	60	(0.05)	7.14%	393,573
316	6,387,348	5,082,943	R1	55	(0.05)	7.14%	115,984
352	783,468	493,862	R2.5	60	(0.15)	7.14%	29,080
353	19,451,237	14,075,175	R2	55	(0.15)	7.14%	592,411
354	23,055,363	10,888,877	R3	70	(0.10)	7.14%	1,033,716
355	111,344	131,522	R1.5	50	(0.51)	7.14%	2,615
356	20,043,612	20,412,992	R2.5	60	(0.30)	7.14%	403,122
359	288,964	163,921	R4	60	-	7.14%	8,932
391	25,039	11,550	SQ	15	-	7.14%	963
39204	92,097	61,031	S2	19	0.10	7.14%	1,561
39205	53,934	27,886	S1.5	15	0.10	7.14%	1,475
39206	130,280	85,517	L2	12	0.10	7.14%	2,267
39208	13,767	9,268	S0	25	0.10	7.14%	223
39209	17,971	4,884	S1.5	11	0.10	7.14%	806
394	102,448	34,569	SQ	20	-	7.14%	4,849
39603	46,889	39,189	L3	20	0.05	7.14%	383
39607	126,056	71,160	L1	20	0.05	7.14%	3,471
39703	3,694,720	3,229,831	SQ	15	-	7.14%	33,206
	522,030,527	390,692,351					**11,814,929**

Table 1. Incremental depreciation annual expense (2) 2016 annual depreciation

	COLSTRIP		**Currently approved parameters UM 1679, Order 14-297**				
Account	Estimated Plant Balance $ at 12/31/2016	Estimated Accum Reserve $ @ 12/31/2016	UM1679 IOWA Survivor Curves	UM1679 Equal Life Group, Projection Life (Year)	UM1679 Net Salvage Rate % (NS)	Annual Rate %, per Order 14-297	CURRENT UM 1679 Paramaters Annual $ Calculation
311	116,386,107	98,246,863	S1.5	90	(0.05)	3.68%	881,675
312	233,495,232	174,513,777	R3	65	(0.05)	3.76%	2,656,674
314	73,963,641	43,668,494	S0.5	60	(0.05)	4.22%	1,434,519
315	23,761,009	19,439,041	R2.5	60	(0.05)	4.14%	228,115
316	6,387,348	5,082,943	R1	55	(0.05)	4.39%	71,284
352	783,468	493,862	R2.5	60	(0.15)	2.68%	10,911
353	19,451,237	14,075,175	R2	55	(0.15)	2.89%	239,689
354	23,055,363	10,888,877	R3	70	(0.10)	2.89%	418,241
355	111,344	131,522	R1.5	50	(0.51)	3.15%	1,153
356	20,043,612	20,412,992	R2.5	60	(0.30)	2.39%	134,884
359	288,964	163,921	R4	60	-	3.46%	4,326
391	25,039	11,550	SQ	15	-	16.03%	2,162
39204	92,097	61,031	S2	19	0.10	7.09%	1,550
39205	53,934	27,886	S1.5	15	0.10	11.65%	2,406
39206	130,280	85,517	L2	12	0.10	16.67%	5,290
39208	13,767	9,268	S0	25	0.10	7.07%	221
39209	17,971	4,884	S1.5	11	0.10	16.85%	1,902
394	102,448	34,569	SQ	20	-	12.15%	8,247
39603	46,889	39,189	L3	20	0.05	7.41%	397
39607	126,056	71,160	L1	20	0.05	9.12%	4,432
39703	3,694,720	3,229,831	SQ	15	-	15.62%	72,616
	522,030,527	390,692,351					**6,180,694**
	Annualized Net Increase/(Decrease) due to change in depreciable life only:						**5,634,234**
		Monthly increamental depreciation amount in Revenue requirement					**$469,520**

Table 2. 2012 to 2016 Plant Balances.
12-31-2016's plant balance is used for the base of the future value to be recovered.

TABLE 2. Colstrip Year End Balances, 2012-2016:
OPUC Order 14-297

FERC	Balances at 12/31/2012		Balances at 12/31/2013	
Account	Plant	Accum Reserve	Plant	Accum Reserve
311	115,308,214	94,985,340	115,138,972	95,757,825
312	216,919,863	169,869,621	224,549,336	171,381,198
314	75,365,579	40,157,331	74,952,559	41,155,686
315	23,556,968	18,545,900	23,557,058	18,797,261
316	6,346,149	4,741,026	6,346,213	4,832,080
352	777,670	441,229	777,670	456,782
353	17,788,443	13,174,975	17,788,443	13,411,360
354	22,841,076	9,290,327	22,841,076	9,669,058
355	110,330	124,137	110,330	126,762
356	19,863,324	19,441,563	19,863,324	19,801,061
359	286,332	146,519	286,332	150,887
391			25,039	3,443
39204	95,365	45,919	92,097	52,612
39205	28,371	17,375	31,640	18,820
39206	134,371	54,601	134,371	66,987
39208	13,767	7,767	13,767	8,312
39209	3,021	1,248	3,021	1,467
393			-	-
39400	58,415	4,155	62,767	10,661
39603	46,889	37,187	46,889	37,796
39607	102,078	49,392	102,078	55,169
39703	3,694,720	2,900,769	3,694,720	2,983,746
	503,340,945	374,036,379	510,417,703	378,778,972

FERC	Balances at 12/31/2014		Balances at 12/31/2015		Balances at 12/31/2016	
Account	Plant	Accum Reserve	Plant	Accum Reserve	Plant	Accum Reserve
311	115,099,828	96,588,217	114,980,407	97,349,652	116,386,107	98,246,863
312	230,461,467	172,044,566	229,441,090	171,920,908	233,495,232	174,513,777
314	73,389,987	40,969,402	73,162,982	42,236,284	73,963,641	43,668,494
315	23,507,999	18,990,054	23,503,626	19,216,964	23,761,009	19,439,041
316	6,318,918	4,921,356	6,315,585	5,013,262	6,387,348	5,082,943
352	777,670	471,751	777,670	482,937	783,468	493,862
353	18,619,481	13,663,172	19,193,691	13,836,783	19,451,237	14,075,175
354	22,841,076	10,039,340	22,841,076	10,469,592	23,055,363	10,888,877
355	110,330	129,300	110,330	130,424	111,344	131,522
356	19,863,324	20,146,752	19,863,324	20,280,922	20,043,612	20,412,992
359	286,332	155,119	286,332	159,587	288,964	163,921
391	25,039	6,412	25,039	9,188	25,039	11,550
39204	92,097	57,690	92,097	59,420	92,097	61,031
39205	54,543	23,057	54,543	25,933	53,934	27,886
39206	134,371	77,061	134,371	83,841	130,280	85,517
39208	13,767	8,792	13,767	9,039	13,767	9,268
39209	30,316	20,887	45,266	20,318	17,971	4,884
393	3,863	92	3,863	315		
39400	74,442	16,873	101,591	25,761	102,448	34,569
39603	46,889	38,331	46,889	38,776	46,889	39,189
39607	126,056	61,396	126,056	66,501	126,056	71,160
39703	3,694,720	3,058,051	3,694,720	3,150,679	3,694,720	3,229,831
	515,572,516	381,487,670	514,814,318	384,587,084	522,030,527	390,692,351

Table 3. The composite remaining life calculation for Colstrip Unit 3 & 4.

	ACCOUNT (1)	SURVIVOR CURVE (2)	NET SALVAGI PERCENT (3)	ORIGINAL COST AT DECEMBER 31, 201 (4)	BOOK RESERVE (5)	FUTURE ACCRUALS (6)	CALCULATED ANNUAL ACCRUAL AMOUNT (7)	CALCULATED ANNUAL ACCRUAL RATE (8)	COMPOSITE REMAINING LIFE (9.0)	=2016-2012	COMPOSITE REMAINING LIFE: Year 12/31/2016
	COLSTRIP 20% share each. untis 3 & 4										
311.00	STRUCTURES AND IMPROVEMENTS	90 - S1.5 *	(5)	115,308,214	94,985,340	26,088,285	958,829	0.83	27.2	4.00	23.20
312.00	BOILER PLANT EQUIPMENT	65 - R3 *	(5)	216,919,863	169,869,621	57,896,235	2,175,748	1.00	26.6	4.00	22.60
314.00	TURBOGENERATOR UNITS	60 - S0.5 *	(5)	75,365,579	40,157,331	38,976,526	1,644,217	2.18	23.7	4.00	19.70
315.00	ACCESSORY ELECTRIC EQUIPMENT	60 - R2.5 *	(5)	23,556,968	18,545,900	6,188,916	256,139	1.09	24.2	4.00	20.20
316.00	MISCELLANEOUS POWER PLANT EQUIPM	55 - R1 *	(5)	6,346,149	4,741,026	1,922,431	84,395	1.33	22.8	4.00	18.80
	TOTAL COLSTRIP			437,496,773	328,299,217	131,072,393	5,119,328	1.17	25.6	4.00	21.60
	TOTAL STEAM PRODUCTION PLANT			897,218,199	661,920,054	306,425,616	26,476,032	2.95	25		21

Table 4. ESTIMATED EFFECT ON CONSUMERS' TOTAL ELECTRIC BILLS

TABLE 4
PORTLAND GENERAL ELECTRIC
ESTIMATED EFFECT ON CONSUMERS' TOTAL ELECTRIC BILLS
2017

CATEGORY	RATE SCHEDULE	Forecast SSEP16E17 CUSTOMERS	MWH SALES	TOTAL ELECTRIC BILLS CURRENT
Residential	7	760,618	7,591,457	$886,882,379
Employee Discount				($916,192)
Subtotal				$885,966,187
Outdoor Area Lighting	15	0	16,223	$3,417,770
General Service <30 kW	32	91,308	1,584,216	$180,848,407
Opt. Time-of-Day G.S. >30 kW	38	380	30,572	$4,070,809
Irrig. & Drain. Pump. < 30 kW	47	3,029	21,104	$4,070,582
Irrig. & Drain. Pump. > 30 kW	49	1,326	64,604	$8,650,530
General Service 31-200 kW	83	11,271	2,830,958	$265,614,832
General Service 201-4,000 kW				
Secondary	85-S	1,229	2,295,575	$188,350,214
Primary	85-P	182	617,103	$47,561,871
Schedule 89 > 4 MW				
Primary	89-P	13	575,337	$38,553,634
Subtransmission	89-T	4	61,824	$4,528,572
Schedule 90	90-P	4	1,531,577	$94,074,917
Street & Highway Lighting	91/95	203	62,783	$12,105,480
Traffic Signals	92	17	3,234	$265,673
COS TOTALS		**869,584**	17,286,568	$1,738,079,477
Direct Access Service 201-4,000 kW				
Secondary	485-S	197	509,370	$12,258,774
Primary	485-P	53	341,979	$7,944,668
Direct Access Service > 4 MW				
Secondary	489-S	1	12,631	$313,860
Primary	489-P	12	760,127	$10,155,124
Subtransmission	489-T	3	298,655	$1,943,206
DIRECT ACCESS TOTALS		266	1,922,762	$32,615,631
COS AND DA CYCLE TOTALS		869,850	19,209,330	$1,770,695,108
Colstrip Cycle Revenues				**$5,644,365**
Percentage Change				**0.3%**

Table 5. 2017 Incremental Revenue Requirement - Colstrip Accelerated Depreciation

Portland General Electric Company
2017 Incremental Revenue Requirement - Colstrip Acclerated Depreciation
Dollars in 000s

	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Annual Rev Req
Sales to Consumers	$ 486	$ 483	$ 480	$ 477	$ 474	$ 471	$ 467	$ 464	$ 460	$ 456	$ 452	$ 447	$ 5,618
Sales for Resale	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Revenues	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Operating Revenues	$ 486	$ 483	$ 480	$ 477	$ 474	$ 471	$ 467	$ 464	$ 460	$ 456	$ 452	$ 447	$ 5,618
Net Variable Power Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Production O&M (Excludes Trojan)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Trojan O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Transmission O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Distribution O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Customer & MBC O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Uncollectibles Expense	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 23
OPUC Fees	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 2	$ 21
A&G, Ins/Bene., & Gen. Plant	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Operating & Maintenance	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 4	$ 3	$ 44
Depreciation	$ 470	$ 470	$ 470	$ 470	$ 470	$ 470	$ 470	$ 470	$ 470	$ 470	$ 470	$ 470	$ 5,634
Amortization	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Property Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Payroll Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Taxes	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Franchise Fees	$ 12	$ 12	$ 12	$ 12	$ 12	$ 12	$ 12	$ 12	$ 12	$ 12	$ 12	$ 11	$ 143
Utility Income Tax	$ 0	$ (1)	$ (1)	$ (2)	$ (3)	$ (4)	$ (5)	$ (6)	$ (7)	$ (9)	$ (10)	$ (11)	$ (60)
Total Operating Expenses & Taxes	$ 486	$ 485	$ 484	$ 483	$ 482	$ 481	$ 480	$ 479	$ 477	$ 476	$ 475	$ 473	$ 5,761
Utility Operating Income	$ 0	$ (2)	$ (4)	$ (6)	$ (8)	$ (10)	$ (13)	$ (15)	$ (18)	$ (20)	$ (23)	$ (26)	$ (143)
Average Rate Base													
Avg. Gross Plant	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Avg. Accum. Deprec. / Amort	$ (235)	$ (704)	$ (1,174)	$ (1,643)	$ (2,113)	$ (2,582)	$ (3,052)	$(3,521)	$ (3,991)	$ (4,460)	$ (4,930)	$ (5,399)	$ (2,817)
Avg. Accum. Def Tax	$ 86	$ 249	$ 398	$ 531	$ 649	$ 751	$ 838	$ 908	$ 964	$ 1,003	$ 1,027	$ 1,036	$ 703
Avg. Accum. Def ITC	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Avg. Net Utility Plant	$ (149)	$ (455)	$ (776)	$ (1,112)	$ (1,464)	$ (1,831)	$ (2,214)	$(2,613)	$ (3,027)	$ (3,457)	$ (3,903)	$ (4,364)	$ (2,114)
Misc. Deferred Debits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operating Materials & Fuel	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Misc. Deferred Credits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Working Cash	$ 18	$ 18	$ 18	$ 18	$ 17	$ 17	$ 17	$ 17	$ 17	$ 17	$ 17	$ 17	$ 209
Average Rate Base	$ (132)	$ (437)	$ (758)	$ (1,094)	$ (1,446)	$ (1,814)	$ (2,197)	$(2,596)	$ (3,010)	$ (3,440)	$ (3,886)	$ (4,347)	$ (1,905)

Table 6. Incremental Electric Tariff, Calculation of Schedule 146 Prices

PORTLAND GENERAL ELECTRIC
Calculation of Schedule 146 Prices

Schedules	2017 Calendar COS Energy MWh	2017 Base Generation Revenues	Generation Allocation	Sch 146 Allocation	2017 Sch 146 Price mills/kWh	2017 Sch 146 Revenues	Cycle MWh	Cycle Revenues
Schedule 7	7,593,517	$529,778	46.86%	$2,632	0.35	$2,658	7,591,457	$2,657
Schedule 15	16,223	$914	0.08%	$5	0.28	$5	16,223	$5
Schedule 32	1,584,961	$102,816	9.09%	$511	0.32	$507	1,584,216	$507
Schedule 38	30,554	$1,832	0.16%	$9	0.30	$9	30,572	$9
Schedule 47	21,027	$1,591	0.14%	$8	0.38	$8	21,104	$8
Schedule 49	64,687	$4,874	0.43%	$24	0.37	$24	64,604	$24
Schedule 83	2,834,384	$181,725	16.07%	$903	0.32	$907	2,830,958	$906
Schedule 85-S	2,290,918	$142,940	12.64%	$710	0.31	$710	2,295,575	$712
Schedule 85-P	623,350	$37,936	3.36%	$188	0.30	$187	617,103	$185
Schedule 89-S	0	$0	0.00%	$0	0.30	$0	0	$0
Schedule 89-P	568,390	$33,583	2.97%	$167	0.29	$165	575,337	$167
Schedule 89-T	61,824	$3,663	0.32%	$18	0.29	$18	61,824	$18
Schedule 90	1,537,355	$85,282	7.54%	$424	0.28	$430	1,531,577	$429
Schedule 91	62,783	$3,538	0.31%	$18	0.28	$18	62,783	$18
Schedule 92	3,234	$185	0.02%	$1	0.28	$1	3,234	$1
TOTAL	17,293,207	$1,130,658	100.00%	**$5,618**		$5,646	17,286,568	$5,644

Table 7. A typical residential customer consuming 840 kWh monthly will see a bill increase of $0.30.

	PORTLAND GENERAL ELECTRIC			
	Effect of proposed rate change on Monthly Bills			
	Tariff Schedule 7			
	Net Monthly Bill			
	Current	**Proposed**	**Percent**	**Monthly**
kWh	**Prices**	**Prices**	**Difference**	**Increase**
50	$16.83	$16.85	0.1%	$0.02
100	$22.08	$22.12	0.2%	$0.04
200	$32.44	$32.51	0.2%	$0.07
250	$37.64	$37.73	0.2%	$0.09
300	$42.85	$42.96	0.3%	$0.11
400	$53.24	$53.38	0.3%	$0.14
500	$63.65	$63.84	0.3%	$0.19
				$0.00
600	$74.03	$74.24	0.3%	$0.21
700	$84.43	$84.69	0.3%	$0.26
800	$94.82	$95.11	0.3%	$0.29
840	$98.98	$99.28	0.3%	$0.30
900	$105.20	$105.53	0.3%	$0.33
1,000	$115.61	$115.97	0.3%	$0.36
1,100	$127.90	$128.30	0.3%	$0.40
1,200	$140.13	$140.56	0.3%	$0.43
1,300	$152.40	$152.88	0.3%	$0.48
1,400	$164.66	$165.17	0.3%	$0.51
1,500	$176.95	$177.50	0.3%	$0.55
1,600	$189.19	$189.76	0.3%	$0.57
1,700	$201.46	$202.07	0.3%	$0.61
1,800	$213.72	$214.37	0.3%	$0.65
2,000	$238.24	$238.96	0.3%	$0.72
2,300	$275.03	$275.87	0.3%	$0.84
2,750	$330.20	$331.19	0.3%	$0.99
3,000	$360.87	$361.95	0.3%	$1.08
3,500	$422.21	$423.48	0.3%	$1.27
4,000	$483.50	$484.94	0.3%	$1.44
4,500	$544.84	$546.47	0.3%	$1.63
5,000	$606.13	$607.93	0.3%	$1.80
7,500	$912.73	$915.43	0.3%	$2.70
10,000	$1,219.27	$1,222.88	0.3%	$3.61