

**EXHIBIT NO. \_\_\_\_ (EDH-1T)  
DOCKETS UE-170033/UG-170034  
2017 PSE GENERAL RATE CASE  
WITNESS: EZRA D. HAUSMAN, PH.D.**

**BEFORE THE  
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND  
TRANSPORTATION COMMISSION,**

**Complainant,**

**v.**

**PUGET SOUND ENERGY,**

**Respondent.**

**Docket UE-170033  
Docket UG-170034**

**RESPONSE TESTIMONY OF  
EZRA D. HAUSMAN, PH.D.  
ON BEHALF OF SIERRA CLUB**

**June 30, 2017**

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### **Exhibit List**

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1     **I.     Professional Qualifications and Purpose of Testimony**

2     **Q.     Please state your name, occupation, and business address.**

3     A.     My name is Ezra D. Hausman, Ph.D. I am an independent consultant doing business as  
4           Ezra Hausman Consulting, operating from offices at 77 Kaposia Street, Auburndale,  
5           Massachusetts 02466.

6     **Q.     Are you providing any exhibits with your testimony?**

7     A.     Yes. I am sponsoring exhibits EDH-2 – EDH-9.

8     **Q.     What is your educational and professional background?**

9     A.     I hold a BA in Psychology from Wesleyan University, an MS in Environmental  
10           Engineering from Tufts University, an SM in Applied Physics from Harvard University,  
11           and a PhD in Atmospheric Chemistry from Harvard University. I have been involved in  
12           analysis of both regulated and restructured electricity markets for approximately 20 years.  
13           I have provided a detailed resume as Exhibit EDH-2.

14           From 2005 until early 2014, I was employed at Synapse Energy Economics, Inc., a  
15           research and consulting company located in Cambridge, Massachusetts, where I served  
16           most recently as Vice President and Chief Operating Officer. At Synapse, and continuing  
17           as an independent consultant, I served as an analyst and expert in several areas related to  
18           my expertise and experience in energy economics. Specific areas include: state and  
19           regional energy, capacity, and transmission planning, including both utility resource  
20           planning and long-term (multi-decadal) climate-constrained resource planning; regulatory  
21           and ratemaking proceedings; electricity and generating capacity market design and

1 analysis; electric system dispatch modeling; economic analysis of environmental and  
2 other regulations, including greenhouse gas regulation, in electricity markets; economic  
3 analysis, price forecasting, and asset valuation in electricity markets; quantification of the  
4 economic and environmental benefits of displaced emissions; treatment of energy  
5 efficiency and renewable energy in electricity and capacity markets; and regulation and  
6 mitigation of greenhouse gas emissions from the supply and demand sides of the U.S.  
7 electricity sector.

8 I have provided testimony and/or appeared before public utility commissions or  
9 legislative committees in Arizona, Illinois, Iowa, Kansas, Louisiana, Maryland,  
10 Massachusetts, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, Nevada,  
11 South Dakota, Vermont, and Washington State, as well as at the federal level. I have  
12 provided expert representation for stakeholders at the PJM ISO, the California ISO, the  
13 Midwest ISO, and at the FERC. While most of my testimony and analytical work has  
14 centered on issues in electricity market economics, I have also brought my expertise as a  
15 scientist to bear on cases involving and greenhouse gas regulation and mitigation in the  
16 electric sector.

17 Prior to joining Synapse, I was employed from 1998 through 2004 as a Senior Associate  
18 at Tabors Caramanis and Associates (TCA) of Cambridge, Massachusetts. In 2004, TCA  
19 was acquired by Charles River Associates (CRA), where I remained until I joined  
20 Synapse in 2005. At TCA/CRA, I performed a wide range of electricity market and  
21 economic analyses and price forecast modeling studies. These included asset valuation

1 studies, market transition cost/benefit studies, market power analyses, and litigation  
2 support. I have extensive personal experience with market simulation, production cost  
3 modeling, and resource planning methodologies and software.

4 **Q. Have you ever testified before the Washington Utilities and Transportation**  
5 **Commission (WUTC)?**

6 A. Yes. I testified on behalf of Sierra Club in Puget Sound Energy's ("PSE" or, "Company")  
7 2012 General Rate Case, Docket Nos. UE-111048 and UG-111049.

8 **Q. What is the purpose of your testimony in this proceeding?**

9 A. In this filing, PSE proposes an accounting treatment of the end-of-life costs for Units 1  
10 and 2 of its Colstrip coal-fired electric generating units in eastern Montana, including  
11 repurposing the proceeds of certain otherwise unrelated federal incentives to cover the  
12 costs of decommissioning and remediation. I recommend certain modifications to PSE's  
13 proposal, and I address the intergenerational equity issues raised by the Company's  
14 actions. I also address the implications of this approach for PSE's ability to adequately  
15 fund decommissioning and remediation not only of these two units, but also of Colstrip  
16 Units 3 and 4. Finally, I address the company's proposed assumptions regarding the  
17 remaining life of Colstrip Units 3 and 4 for depreciation purposes.

18 **II. Summary of Conclusions and Recommendations**

19 **Q. What are your conclusions regarding the Company's plans for funding the liability**  
20 **associated with Colstrip Units 1 and 2?**

21 A. The Company's plan to use treasury grants and Production Tax Credits (PTCs) to offset

1 the costs of decommissioning and remediation for Colstrip Units 1 and 2 was authorized  
2 by the Washington legislature in June 2016. This approach represents a reasonable if  
3 unconventional path out of a bad situation for PSE. The company proposes to combine  
4 two unlike factors into one, using unrelated treasury grants and tax credits whose value  
5 should already accrue to ratepayers to mask the impact of its earlier use of an unrealistic  
6 depreciable life for Colstrip Units 1 and 2. The benefit to this approach is that it combines  
7 two problems of intergenerational inequity, which roughly balance each other out.

8 While the Company may have found a means to paper over this predicament of its own  
9 making with regard to Units 1 and 2, the Commission should not condone this one-time  
10 fix as good ratemaking practice. Specifically, PSE's proposed depreciation schedule for  
11 Units 3 and 4 in the current petition would lead it directly into the same bind as those  
12 units reach retirement, but with no similar mechanism available to salvage the situation  
13 and restore intergenerational equity.

14 **Q. What are your conclusions regarding PSE's request to adjust the depreciation**  
15 **schedules for Colstrip Units 3 and 4?**

16 A. I agree with PSE's witness John J. Spanos that PSE should accelerate the depreciation  
17 schedule for Colstrip Units 3 and 4. However, the Company's proposal to set  
18 depreciation rates based on a 2035 end-of-life date does not go far enough. I find that the  
19 company's assumptions regarding the long-term future viability of Units 3 and 4 are  
20 manifestly unrealistic for a number of reasons, including the cost of coal relative to other  
21 fuels and generation resource types; the likely future costs for maintenance and



1 environmental upgrades; the goal of the State of Washington, as codified in Governor  
2 Inslee's Executive Order 14-04 (calling for the ultimate elimination of coal generation  
3 from Washington's electricity supply) and the limited long-term availability of a  
4 continued economically-viable coal supply for Units 3 and 4 from the Rosebud mine.

5 I believe that a much more reasonable assumption for the end of the useful life of these  
6 units is December 31, 2024, based on consideration of the company's own experts'  
7 proposal in its 2007 filing in Docket UE-072300, updated with more recent information.  
8 For reasons that I will detail, the outlook for coal units such as Colstrip Units 3 and 4 is  
9 significantly worse today than it was in 2007 when PSE's experts made their previous  
10 end-of-life assessment. The company seems to be asserting, without explanation, that  
11 these units are somehow immune to the trends that are affecting the rest of the industry  
12 throughout the United States, including Colstrip Units 1 and 2. Colstrip Units 3 and 4 are  
13 also exposed to these factors, and will not somehow escape the realities of today's energy  
14 market economics just because PSE assigns them an unrealistically long depreciable life.

15 If allowed to make this misleading assumption, the Company's proposal would lead to  
16 significant underfunding of its decommissioning and remediation requirements over the  
17 next several years, which will inevitably lead to severe rate shock and/or impositions of  
18 intergenerational inequity on ratepayers as the company struggles to make up lost ground.

19 **Q. What are your recommendations for this Commission?**

20 A. I make the following recommendations:

- 1           1. The Commission should accept PSE’s proposal to “fund” the decommissioning and  
2           remediation of Colstrip Units 1 and 2 by reassigning its outstanding treasury grants  
3           and tax credits from a regulatory liability account to a FERC 108 account. However,  
4           the treasury grants and tax credits should not be applied to pay down any  
5           undepreciated plant balance. PSE should bear some of the costs associated with its  
6           poor planning for the shutdown of Colstrip Units 1 and 2. Once Units 1 and 2 stop  
7           providing service to PSE customers, whether that occurs in 2022 or sooner, the  
8           commission should require PSE to remove any undepreciated plant balance for  
9           Colstrip Units 1 and 2 from rate base and to create a separate regulatory asset for  
10          those amounts. Given that those assets will no longer be “used and useful,” and to  
11          encourage better planning with future depreciation schedules, the Commission should  
12          not allow the Company to recover its full authorized rate of return on that regulatory  
13          asset. I recommend that the Commission authorize recovery of the remaining plant  
14          balance only, without allowing a recovery of its cost of capital on that balance.
- 15          2. The Commission should reject PSE’s proposed depreciation timeline for Colstrip  
16          Units 3 and 4, and instead base the depreciation schedule for these units on an  
17          estimated retirement date no later than December 31, 2024. This date is more  
18          consistent with the Company’s proposal from 2007, adjusted by the updated realities  
19          of the electricity marketplace. By my estimation, this will result in a short-term  
20          increase in annual revenue requirements of approximately \$16 million; however,  
21          rectifying the depreciation schedule now will significantly reduce ratepayers’  
22          exposure to Colstrip’s liabilities. Otherwise, there is a high likelihood that PSE will

1           once again find itself with a large undepreciated balance and inadequate funds for  
2           decommissioning and remediation when Units 3 and 4 ultimately retire.

3           3. The Commission should direct PSE to limit its expenditures on Colstrip units 3 and 4  
4           to routine maintenance and operations expenditures consistent with an end of life date  
5           no later than December 31, 2024.

6           4. Regardless of the depreciation schedule adopted by the Commission in this docket,  
7           the Commission should require more frequent updates and adjustments to  
8           depreciation rates as Colstrip Units 3 and 4 near their end of life. In addition to the  
9           current practice of evaluating the depreciation schedule every five years, the  
10          Commission should direct the Company to conduct a routine end of life assessment  
11          between its depreciation filings, or at intervals of no more than three years. These  
12          more frequent updates will allow the Company and the Commission to make  
13          adjustments to depreciation rates at Colstrip 3 and 4 based on updated information  
14          and projections, and will prevent the depreciation schedule from straying too far from  
15          the units' actual useful lives.

16   **III. Background on the Depreciation Schedules for All Colstrip Units**

17   **Q. What are the currently applicable depreciation schedules for each of the Colstrip**  
18   **units?**

19   A. Colstrip Units 1 and 2 are scheduled to be fully depreciated in 2035, and Colstrip Units 3

1 and 4 are scheduled to be fully depreciated in 2044 and 2045, respectively.<sup>1</sup>

2 **Q. Are those the original depreciation schedules for these units?**

3 A. No. Previously, the Colstrip units all had much shorter depreciable lives. However, in  
4 2007 the Commission approved schedules that significantly – and it turns out incorrectly  
5 – extended their assumed useful life for depreciation purposes.

6 **Q. What end-of-life assumptions did PSE rely on for each of the Colstrip units for  
7 depreciation purposes as of the company’s 2007 general rate case (GRC)?**

8 A. As part of PSE’s 2007 GRC filing in Docket UE-072300, the company submitted a  
9 depreciation study performed by Gannett Flemming and sponsored by PSE witness C.  
10 Richard Clarke. In this study, a “probable retirement year” of 2019 was used for both of  
11 the older Colstrip units consistent with a 44-year lifespan for Unit 1 and a 43-year  
12 lifespan for Unit 2. PSE’s witness also estimated probable retirement years for Colstrip  
13 Units 3 and 4 at 2024 and 2026, consistent with life spans of 40 and 41 years,  
14 respectively.<sup>2</sup>

15 **Q. Did WUTC Staff and Public Counsel support PSE’s proposed depreciation  
16 schedules for the Colstrip units based on this end-of-life assumption?**

17 A. No. WUTC Staff witness William H. Weinman argued that the company should assume a  
18 sixty-year life for the Colstrip units, based on “comparing Colstrip with other coal-fired

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<sup>1</sup> Direct Testimony of John J. Spanos, Exhibit No. \_\_ (JJS-1T) at p.8.

<sup>2</sup> WUTC Docket No. UE-072300, Second Exhibit to the Prefiled Direct Testimony of C. Richard Clarke, p. II-28. (Exh. EDH-3).

1 steam plants.”<sup>3</sup> Public Counsel witness Charles W. King also argued for a 60-year  
2 lifespan, also based on his analysis of coal-fired plant retirements going back to 1900.<sup>4</sup>  
3 Mr. King also offered as supporting evidence his interpretation of the Company’s then-  
4 current IRP, and a depreciation schedule used by Colstrip co-owner PacifiCorp from a  
5 multi-state settlement.

6 **Q. Were the witnesses advocating for longer retirement dates correct in their**  
7 **estimates?**

8 A. No. We now know with certainty that the estimated end of life dates of 2035 for Colstrip  
9 Units 1 and 2 were incorrect. Those units will retire by 2022, if not sooner.<sup>5</sup> The 2007  
10 estimates for Units 1 and 2 were therefore wrong by at least 13 years. Similarly, while we  
11 do not currently know exactly when Colstrip Units 3 and 4 will ultimately retire, it is  
12 exceedingly unlikely that those units will continue operating until 2044 and 2045 as  
13 suggested by their current depreciation schedules.

14 **Q. Is a statistical analysis of coal plant retirements dating back to 1900 a reasonable**  
15 **basis for estimating the probable service lives of the Colstrip units? If not, why not?**

16 A. No. The economic and regulatory environment for coal today is completely different  
17 from anything that existed over most of the time period referenced by witnesses King and  
18 Weinman in Docket No. UE-072300/UG-072301, rendering their statistical analysis  
19 irrelevant to estimating the future lives of the Colstrip units.

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<sup>3</sup> WUTC Docket No. UE-072300, Testimony of William H. Weinman, p. 8 at 7. (Exh. EDH-4).

<sup>4</sup> Direct Testimony of Charles W. King, WUTC Docket No. UE-072300, pp. 11-12. (Exh. EDH-5).

<sup>5</sup> Direct Testimony of Ronald J. Roberts, Ex. No.\_\_(RJR-1CT), pp. 39-41.

1 For most of the 20<sup>th</sup> century there were very few retirements of coal plants, as demand for  
2 power grew exponentially and the availability and cost of coal made it more attractive to  
3 utilities than alternative energy sources. In addition, the environmental and public health  
4 impacts of coal combustion were less well-known, and/or were considered an acceptable  
5 cost of this engine of economic growth. In 1970, the US Congress passed the Clean Air  
6 Act and began the process of requiring coal plants to install pollution controls to reduce  
7 the environmental and health impacts of their emissions. However, Congress exempted  
8 many existing coal plants from strict emissions control requirements. This loophole had  
9 the unintended consequence of actually prolonging the life of many coal plants that  
10 lacked modern pollution controls, as companies sought to avoid the costs associated with  
11 the technology that would be required on new, or substantially refurbished, coal-fired  
12 power plants.

13 Over the last two decades this picture has changed. In much of the country the growth in  
14 demand for electricity has slowed or even halted due to factors such as stringent  
15 appliance energy efficiency standards, along with utility-run energy efficiency programs  
16 such as PSE's.<sup>6</sup> (The US Department of Energy's Annual Energy Outlook (AEO) for  
17 2017 projects a total increase in electricity consumption of just 2.0% in the Western  
18 region of the United States by 2035 over 2015 levels, despite an 804% increase in  
19 electricity demand for transportation.<sup>7</sup>) More recent environmental regulations have  
20 required existing coal-fired plants to reduce their emissions of harmful and haze-inducing

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<sup>6</sup> <https://pse.com/savingsandenergycenter/Pages/default.aspx>.

<sup>7</sup> US Department of Energy, Energy Information Administration, Annual Energy Outlook for 2017. Available at <https://www.eia.gov/outlooks/aeo/>.

1 pollutants, in addition to better management of their water use, their impact on aquatic  
2 life, and disposal of combustion residuals (a.k.a. ash). These mandates often necessitate  
3 costly equipment upgrades for plants to continue operating.

4 At the same time, the availability of natural gas has increased with the development and  
5 widespread use of hydraulic fracturing, and the current and expected cost of gas has  
6 dropped to the point where it is often cost-preferable to coal as a generation fuel. The cost  
7 of renewable energy sources has also plummeted, while the demand for renewable-  
8 sourced energy has increased as a result of state Renewable Portfolio Standards and other  
9 policies. AEO 2017 projects an increase in renewable generation of 81.2% over 2015  
10 levels by 2035, replacing not just coal (decrease of 77.8%) but also natural gas (decrease  
11 of 46.4%.)

12 Finally, coal-fired plants such as Colstrip are very large point-sources of carbon dioxide  
13 (CO<sub>2</sub>) and other greenhouse gases, which have well-documented and extremely harmful  
14 long-term impacts on the Earth's climate and environment, human health, and economic  
15 well-being. The United States currently lags other countries in federal policies to address  
16 this threat. However, numerous states, including Washington and California, are moving  
17 aggressively to reduce the greenhouse gas emissions associated with electricity  
18 production and other economic activity, transforming the regional electricity market by  
19 pushing the generation mix away from high-carbon sources such as Colstrip and towards  
20 cleaner generating technologies. There has also been widespread recognition throughout  
21 the electric industry that the United States will ultimately implement policies that impose

1 a price on greenhouse gas emissions as the deleterious effects of global climate change  
2 become increasingly difficult to ignore or deny.

3 These factors have led to conditions where many coal plants cannot compete  
4 economically, and even more cannot justify continued investments in either  
5 environmental upgrades or other significant capital improvements given their long-term  
6 outlook. As a result, coal plants have been retired, or repowered to burn gas, at an  
7 unprecedented rate over the last decade. As tallied by the Sierra Club, over 250 coal  
8 plants have retired or committed to retire in the United States since 2010, or about 50%  
9 of all coal plants in the country.<sup>8</sup> Today, even larger, younger coal plants are struggling to  
10 survive the economic competition from cleaner, cheaper energy sources.<sup>9</sup>

11 **Q. Did PSE Manager of Colstrip Project Operations & Fuels Michael L. Jones,**  
12 **testifying in PSE's 2007 general rate case, express a similar outlook on coal plants as**  
13 **the one outlined above?**

14 A. Only partly. In his rebuttal testimony Mr. Jones provided a detailed description of the  
15 environmental pressures the Colstrip units were likely to face in the years ahead,<sup>10</sup> along  
16 with specific concerns about the long-term viability of the plant's coal supply.<sup>11</sup> However,  
17 Mr. Jones could not have anticipated the other economic factors that have compounded  
18 the economic distress for coal plants in the decade since the 2007 rate case.

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<sup>8</sup> <http://content.sierraclub.org/coal/>.

<sup>9</sup> See, for example, E&E News, April 27, 2017: "Big Young Power Plants are Closing. Is it a new trend?" Available at <https://www.eenews.net/stories/1060053677>.

<sup>10</sup> Prefiled Rebuttal Testimony of PSE Witness Michael J. Jones in Docket No. UE-072300, pp. 5-15. (Exh. EDH-6).

<sup>11</sup> *Ibid.*, p. 7.



1 **Q. Did the Commission apply the end-of-life dates proposed by the company in setting**  
2 **depreciation rates for the Colstrip units?**

3 A. No. The 2007 rate case was ultimately settled in a stipulation that set depreciation rates  
4 based on a 60-year lifespan for each of the Colstrip units. Specifically, the depreciation  
5 rates for Units 1 and 2 were set using the straight-line method with end-of-life set at 2035  
6 and 2036, respectively, while the depreciation rates for Units 3 and 4 were set, also using  
7 the straight-line method, with end-of-life set at 2044 and 2045, respectively.

8 **IV. Colstrip Units 1 and 2 Retirement**

9 **Q. What is the current schedule for retiring Colstrip Units 1 and 2?**

10 A. Pursuant to a settlement agreement resolving clean air act litigation with Sierra Club and  
11 the Montana Environmental Information Center, PSE and Talen Montana (the owners of  
12 Colstrip Units 1 and 2) agreed to retire the units no later than July 1, 2022. The settlement  
13 is described by PSE witness Ronald J. Roberts, who also provides the agreement itself as  
14 Exhibit No. \_\_\_(RJR-18). Mr. Roberts also describes additional factors that may prompt  
15 an even earlier retirement of Units 1 and 2.<sup>12</sup>

16 **Q. Please describe the economic challenges contributing to the retirement of Colstrip**  
17 **Units 1 and 2 in 2022 or earlier?**

18 A. In addition to the issues addressed by Mr. Roberts, there are numerous signs that Colstrip  
19 Units 1 and 2 are facing substantial economic pressure. Talen representatives have  
20 reportedly announced that the company is losing tens of millions of dollars a year on

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<sup>12</sup> Direct Testimony of Ronald J. Roberts, Ex. No.\_\_(RJR-1CT), pp. 39-41.

1 Colstrip.<sup>13</sup> As a result, the Company issued a notice in 2016 that it wished to cease its  
2 role as operator of the plants in 2018.<sup>14</sup> In addition, the owners have been seeking a  
3 multi-million dollar tax break from the Montana legislature to help keep the units  
4 running.<sup>15</sup>

5 These events are consistent with predictions made in a 2015 study by the Institute for  
6 Energy Economics and Financial Analysis (IEEFA), cited by PSE witness Roberts in his  
7 direct testimony, entitled “A Bleak Future for Colstrip Units 1 and 2.”<sup>16</sup> The IEEFA study  
8 found that even in its “High Scenario”, with more attractive power prices for Colstrip, the  
9 plants earnings do not “appear anywhere near adequate to enable the company to pay  
10 interest, taxes, depreciation and amortization while earning any significant after-tax  
11 profits for its owner(s).” Under the IEEFA “Moderate Scenario”, which was based on  
12 then-current futures market power prices and other “expected value” projections, the  
13 owners would lose millions of dollars every year the plant operates starting in 2015 and  
14 growing significantly worse by 2017 and beyond.

15 On March 4, 2016 IEEFA President David Schlissel presented an updated analysis to the

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<sup>13</sup> “Colstrip operator wants out in 2 years or less”, The Missoulian, May 25, 2016. Available at: [http://missoulian.com/news/state-and-regional/colstrip-operator-wants-out-in-years-or-less/article\\_d0aae700-4348-5007-9bf3-1ed9758de6f8.html](http://missoulian.com/news/state-and-regional/colstrip-operator-wants-out-in-years-or-less/article_d0aae700-4348-5007-9bf3-1ed9758de6f8.html); “Colstrip operators contemplate early shutdown”, E&E News – Climatewire, Jan. 20, 2017. Available at: <https://www.eenews.net/climatewire/2017/01/20/stories/1060048701>.

<sup>14</sup> PSE Response to Sierra Club Data Request No. 004. (Exh. EDH-7, pp. 1-2). PSE supplemented this response on June 27, 2017 – three days prior to the testimony deadline – with a letter stating that Talen had withdrawn its notice to resign as operator of Colstrip.

<sup>15</sup> Electric Light and Power, February 22, 2017: “Colstrip power plant owner pushes for tax break to keep plant units open.” Available at <http://www.elp.com/articles/2017/02/colstrip-power-plant-owner-pushes-for-tax-break-to-keep-plant-units-open.html>.

<sup>16</sup> Direct Testimony of Ronald J. Roberts, Exhibit No.\_\_(RJR-1CT)

1 WUTC<sup>17</sup> showing that “Talen will experience very significant financial losses due to  
2 Colstrip 1&2” and that “Generating power at Colstrip 1&2 is substantially more  
3 expensive for Puget Sound’s ratepayers than buying power at Mid-Columbia Hub.”<sup>18</sup>

4 **Q. What is the status of the coal supply contract with the Rosebud Mine for Colstrip**  
5 **Units 1 and 2?**

6 A. PSE and Talen Energy, the co-owners of Colstrip Units 1 and 2, sent a notice to Western  
7 Energy Company on December 29, 2016 stating that they would be terminating the  
8 contract to purchase coal from the Rosebud Mine for these units because certain signs of  
9 resource depletion, specified in their Coal Sales and Purchase agreement, had been  
10 reached. Specifically, all of the available coal in so-called “Area D” had been delivered,  
11 and the average stripping ratio<sup>19</sup> of Areas A and B exceeded a specified threshold.<sup>20</sup>  
12 Pursuant to this notice, the contract to purchase Rosebud Mine coal for Units 1 and 2  
13 expires on December 31, 2019.

14 **Q. Have the Colstrip Units 1 and 2 owners negotiated a replacement coal contract for**  
15 **these units?**

16 A. No. According to PSE’s response to Sierra Club Data Request 010, “PSE *expects to work*  
17 *with Western Energy to negotiate an extension to the contract that supplies coal for Units*  
18 *1 and 2 and that matches the purchase commitment to the expected retirement of the*

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<sup>17</sup> IEEFA, 2016, “A Bleak Future for Colstrip Units 1 and 2 Has Become Much Bleaker.” Ex. No. \_\_ (RJR-12).

<sup>18</sup> Ibid, p. 4.

<sup>19</sup> “Stripping ratio” refers to the volume of worthless or waste rock that must be removed to get at a unit volume of ore.

<sup>20</sup> PSE’s response to Sierra Club Data Request No. 008 with attachment. (Exh. EDH-7, pp. 3-6).

1 Units.” (emphasis added.)<sup>21</sup> The costs and other terms for this agreement, if any, are  
2 unknown.

3 **Q. Is Sierra Club recommending an earlier retirement date for Colstrip Units 1 and 2?**

4 A. No. Sierra Club is not making any recommendation for when Units 1 and 2 should retire.  
5 I am simply making an observation similar to that of Mr. Roberts, that based on the  
6 factors discussed above, and because co-owner Talen Energy finds the plant uneconomic  
7 to own and operate and is likely continuing to lose millions of dollars per year, an earlier  
8 retirement date of Units 1 and 2 may ultimately occur. Whether a retirement occurs in  
9 2022 or earlier, given the mismatch in the current depreciation schedule and the actual  
10 retirement date, it is important to consider how the Company will treat the undepreciated  
11 plant balances once Units 1 and 2 are no longer “used and useful.”

12 **Q. Why is it important to use a retirement date for ratemaking purposes that is**  
13 **consistent with the expected life of the resource in question, and what are the**  
14 **implications of failing to do so?**

15 A. According to PSE’s response to Public Counsel Data Request No. 413, “Closely  
16 matching the cost recovery associated with generation assets with the useful life of the  
17 facilities provides intergenerational equity and helps assure that the customers who  
18 benefit from an asset placed in service or an expense incurred for the provision of their  
19 electric or gas services, bears the cost associated with those same assets or expenses.”<sup>22</sup>

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<sup>21</sup> Exh. EDH-7, pp. 7-8.

<sup>22</sup> PSE’s response to Public Counsel Data Request No. 413. (Exh. EDH-7, pp. 42-43).

1 Failure to match cost recovery with the useful life of the facilities deprives ratepayers of  
2 these benefits. Since PSE's 2007 rate case, the company has been recovering the costs of  
3 Colstrip Units 1 and 2 at far too low a rate because it was using depreciation rates  
4 associated with the unrealistic expectation that the units would continue to be used and  
5 useful until 2035 and 2036, respectively. As the Company notes, this failure required an  
6 accounting adjustment that "reclassifies the expected net book value of Colstrip Units 1  
7 and 2 at shut down from plant in service to a deferred balance sheet account in  
8 recognition that, from a GAAP perspective, Colstrip Units 1 and 2 have an agreed upon  
9 shut down date that does not correspond to the level of depreciation expense currently  
10 being recognized for Colstrip Units 1 and 2."<sup>23</sup> Once the 2022 retirement date was  
11 established, PSE was saddled with a \$176.8 million regulatory asset (as of the projected  
12 retirement date) to be recovered in future years from customers who will not be  
13 benefiting from the units' useful lives.<sup>24</sup>

14 This regulatory asset will be neither used nor useful to PSE's customers once Units 1 and  
15 2 have retired. Nonetheless, PSE "believes all costs associated with the anticipated  
16 retirement of Colstrip 1 and 2, including the NBV of the plant, will be recovered through  
17 rates along with a return on the regulatory asset based on prior precedent."<sup>25</sup> Ratepayers  
18 have already been funding PSE's debt obligations and a return on equity for a plant with

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<sup>23</sup> PSE's response to Public Counsel Data Request No. 418. (Exh. EDH-7, p. 44).

<sup>24</sup> See PSE's response to WUTC Data Request 459 (Exh. EDH-7, pp. 45-46), Attachment A (Exh. EDH-8) for the calculation of this regulatory asset. The transaction is also described in PSE's February 22, 2017 Report to the Audit Committees of the Board of Directors, provided as Attachment B to PSE's response to Public Counsel's Data Request No. 177. (Exh. EDH-7, pp. 13-36).

<sup>25</sup> Attachment B to PSE's response to Public Counsel's Data Request No. 177, p. 5-6, 16. (Exh. EDH-7, pp. 13-36). (Attachments excluded.)

1 an elevated book value due to an unrealistically low depreciation rate. They should not  
2 have to continue to fund the cost of capital for the same undepreciated plant once it is no  
3 longer providing electric service.

4 **Q. What is the source of funds that PSE plans to use to offset the cost of**  
5 **decommissioning and remediation for Colstrip Units 1 and 2?**

6 A. According to PSE witness Katherine Barnard, “PSE is proposing to utilize the regulatory  
7 liability accounts associated with the Lower Baker and Snoqualmie Treasury Grants and  
8 the existing Production Tax Credits, to address the decommissioning and remediation  
9 costs associated with Colstrip Units 1 and 2.”<sup>26</sup> This was authorized by the Washington  
10 Legislature as Chapter 80.84 RCW;<sup>27</sup> however, PSE still requires Commission approval  
11 to make this reclassification.

12 **Q. Please describe the source of the production tax credits.**

13 A. The federal production tax credits (PTCs) are tax credits earned by PSE in direct  
14 proportion to the quantity of energy produced at its Hopkins Ridge and Wild Horse wind  
15 energy facilities during the first ten years of operation for each facility. According to PSE  
16 witness Doyle, PSE has accumulated approximately \$200 Million in PTCs<sup>28</sup> but, as tax  
17 credits, they can only be monetized when the company has an operating profit against  
18 which to credit them. Because PSE has used bonus depreciation to generate net operating  
19 losses (NOL) and eliminate its federal tax liability for several years, these PTCs have

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<sup>26</sup> Direct Testimony of PSE witness Katherine Barnard, Ex. No.\_\_(KJB-1T), p. 83.

<sup>27</sup> <http://app.leg.wa.gov/RCW/default.aspx?cite=80.84&full=true>.

<sup>28</sup> Direct Testimony of Daniel A. Doyle, Ex. No.\_\_(DAD-1T), p. 47.

1        been accumulating.<sup>29</sup> If and when the company shows an operating profit, its currently  
2        approved procedure would be to monetize the PTCs and record the proceeds in a Tariff  
3        Schedule 95A account to be repaid to customers.<sup>30</sup> However, the extent and timing of  
4        PSE's ability to monetize the PTCs is unknown. In response to Public Counsel Data  
5        Request 285, which asked PSE for projections of the company's PTC utilization by year,  
6        the company objected that such a forecast "requires assumptions and speculations about  
7        future events. For example, tax reform may have a significant impact on taxable income  
8        and Net Operating Loss ("NOL") and Production Tax Credit ("PTC") usage."<sup>31</sup>

9        PTCs were originally intended by Congress to reduce the levelized cost of wind power, in  
10       recognition of the environmental and economic benefits of this resource. They also  
11       provided federal support to this nascent industry by reducing the cost of wind power to  
12       utilities and ratepayers to a level that was comparable with alternative generation sources,  
13       at a time when it was not cost-competitive without these instruments. Certainly, part of  
14       the justification for PSE's investing in the Hopkins Ridge and Wild Horse wind projects  
15       was that they would generate these tax credits, which would offset any increased costs for  
16       ratepayers. However, due to the unexpected availability of bonus depreciation for PSE,<sup>32</sup>  
17       Customers have had to wait over a decade to get the benefit of these instruments, and  
18       they are still waiting today.

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<sup>29</sup> See PSE's response (Exh. EDH-7, pp. 40-41) and attachment A (Exh. EDH-9) to Public Counsel Data Request 286 for an accounting of the production, use, and accumulation of PTCs for each of the wind projects.

<sup>30</sup> Direct Testimony of Katherine J. Barnard, Ex. No.\_\_(KJB-1T), p. 84.

<sup>31</sup> PSE Response to Public Counsel Data Request 285, p.2. (Exh. EDH-7, pp. 37-39).

<sup>32</sup> PSE response to Public Counsel Data Request 286(b), (Exh. EDH-7, pp. 40-41): "In 2005 and 2006, bonus depreciation was not contemplated as the law enabling bonus depreciation had expired in 2004. PSE's general expectation was that the PTCs would be used when generated. Bonus depreciation was enacted in 2008 and has been reenacted continually since that time."

1 **Q. Please describe the source of the Lower Baker and Snoqualmie treasury grants.**

2 A. These treasury grants derive from federal incentives that were made available pursuant to  
3 the American Recovery and Reinvestment Act (ARRA) of 2009 as an alternative to  
4 Production Tax Credits, in part at least because companies like PSE were having trouble  
5 monetizing their PTCs. PSE was qualified to receive the treasury grants to help fund  
6 upgrades to the Snoqualmie Project and the Lower Baker Powerhouse because these  
7 projects resulted in incremental carbon-free hydropower generation. The Company's  
8 expectations regarding the treasury grants were included in the testimony of PSE  
9 witnesses Douglas S. Loreen and Katherina J. Barnard in the company's 2013 PCORC  
10 filing, Docket No. UE-130617.

11 PSE did not use treasury grants as an adjustment to the cost of the underlying project (the  
12 upgrades at Snoqualine and the Lower Baker Powerhouse) but instead keeps them in a  
13 regulatory liability account under Tariff Schedule 95A to be "passed back to customers  
14 outside of general rates and the general rate case process."<sup>33</sup> Nonetheless they are a  
15 benefit to ratepayers resulting from investments in these resources, and they were made  
16 available for the purpose of encouraging the hydropower investments by offsetting some  
17 of the cost of the projects.

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<sup>33</sup> Prefiled Direct Testimony of Katherine J. Barnard, Docket No. UE-130617, Ex. No.\_\_(KJB-1CT), p. 13.



1 **Q. Is it reasonable for PSE to net the funds associated with the treasury grants and**  
2 **production tax credits against the cost of decommissioning and remediation of**  
3 **Colstrip Units 1 and 2 for accounting purposes? Why or why not?**

4 A. It is a reasonable approach under the circumstances as a path forward out of a bad  
5 situation. However, with regard to the PTCs, there remains significant uncertainty  
6 regarding if and when PSE will be able to monetize these instruments. PSE expects to  
7 begin utilizing them in 2019, and, under current law, the Company believes it will be able  
8 to fully utilize them by 2020. Ongoing efforts at federal tax reform could alter this  
9 picture.<sup>34</sup>

10 In addition, the proposed transfer masks the fact that these instruments – the treasury  
11 grants and the PTCs – were already used to justify earlier generation investments, and  
12 their proceeds already belong to the ratepayers who funded those investments in the first  
13 place. To now use those same instruments to “offset” the cost of decommissioning and  
14 remediation for Colstrip Units 1 and 2 deprives ratepayers of a benefit they had been  
15 promised related to the earlier investments.

16 In general, unrelated revenues and costs should be clearly separated into their appropriate  
17 accounts so they can be judged on their own merits. Regulatory accounting is designed  
18 specifically for this purpose, and this is almost a textbook example of why. Nevertheless,  
19 there is a benefit to this approach as a one-time solution to resolve a funding shortfall for  
20 the decommissioning and remediation of Colstrip. As noted above, past ratepayers should

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<sup>34</sup> Doyle Testimony, Ex. No.\_\_(DAD-1T), p. 49.

1 have been the ones to receive the benefits of the tax credits. Similarly, past ratepayers  
2 also should have been funding the decommissioning and remediation liabilities for  
3 Colstrip. Matching those past accrued benefits with those past accrued liabilities roughly  
4 neutralizes the two problems of intergenerational inequity.

5 The Commission should clarify, however, that the tax credits and treasury grants be  
6 applied only to decommissioning and remediation expense. They should not be used to  
7 pay-down the undepreciated capital balances at Colstrip. PSE should be held accountable  
8 for first agreeing to, and later failing to correct, an unrealistic depreciation schedule for  
9 its assets. Finally, the proposed treatment is an acceptable solution to the current funding  
10 shortfall for depreciation and remediation expense, but it should not be seen as  
11 permission for PSE to make such errors in the future.

12 **Q. What treatment do you propose for the undepreciated balance for Colstrip Units 1**  
13 **and 2 upon their retirement?**

14 A. As noted above, PSE is facing an approximately \$176.8 million undepreciated balance at  
15 Colstrip Units 1 and 2 based on a 2022 retirement date. This undepreciated balance raises  
16 the same intergenerational equity concerns as the underfunded liabilities for  
17 decommissioning and remediation that the Company seeks to address through the  
18 repurposing of treasury grants and PTCs. PSE should be held accountable for mitigating  
19 the rate impact on future customers from having to fund both retired units and  
20 replacement power at the same time. The Commission should require that when Colstrip  
21 Units 1 and 2 stop providing service to PSE customers, whether that occurs in 2022 or

1           sooner, PSE should be allowed to recover the undepreciated plant balances, but at a rate  
2           less than the Company's full authorized rate of return. I recommend that the Commission  
3           authorize recovery of the amortization of this remaining plant balance only, but without  
4           allowing carrying costs on that balance.

5           Other jurisdictions have adopted similar treatment for assets that are retired before the  
6           end of their expected depreciable lives. The California Public Utilities Commission  
7           directly addressed the issue of a retirement before the expected depreciation level of a  
8           plant in its decision on the early retirement of Humboldt Bay:

9                     We agree with staff that [Humboldt Bay] Unit 3 is no longer "used and  
10                    useful" and should be excluded from rate base. While Unit 3 did operate  
11                    for 13 years, it will never operate again and can no longer be considered  
12                    "useful" utility plant. Unit 3 was entered into rate base under the  
13                    assumption that it would serve customers for 30 years. Shareholders were  
14                    entitled to a return and ratepayers were liable for the full ownership cost as  
15                    long as Unit 3 operated as expected. Once the plant was closed in 1976,  
16                    Unit 3 no longer qualified for inclusion in rate base and was eventually  
17                    and properly removed from rate base in 1979. We will not deviate from  
18                    the Commission's well-established principle that only "used and useful"  
19                    utility plant shall be concluded [sic] in rate base.<sup>35</sup>

20           Allowing PSE to only recover the undepreciated balance of Colstrip 1 and 2 when it stops

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<sup>35</sup> *Re Pac. Gas & Elec. Co.*, Application 83-09-49, Decision 85-08-046, 18 CPUC 2d 592 (Aug. 21, 1985) 15.

1 providing service, but without recovering its cost of capital, appropriately balances  
2 shareholder and ratepayer interests.

3 **V. Depreciation Schedule for Colstrip Units 3 and 4**

4 **Q. What is PSE currently proposing for the depreciable lives of Colstrip Units 3 and 4?**

5 A. PSE proposes to reduce the end-of-life assumption for both Colstrip Unit 3 and Unit 4 to  
6 2035. The currently applicable depreciable lives for those units were set pursuant to the  
7 settlement of the 2007 rate case (Docket No. UE-072300) at 2044 and 2045, respectively.

8 **Q. What end-of-life date did PSE propose in its 2007 rate case?**

9 A. In its 2007 application in UE-072300, the Company proposed a retirement date of 2024  
10 for Unit 3 and 2026 for Unit 4 in its 2007 Rate Case.

11 **Q. Do you support the Company's proposal in its current filing to reduce the end-of-  
12 life assumption for Units 3 and 4 for depreciation purposes to 2035?**

13 A. I agree that the company should shorten the depreciable lives of these units, but I find  
14 that the company's proposal falls short. The depreciation schedules for these units should  
15 be set with an end-of-life assumption no later than that originally proposed by the  
16 company for Unit 3 in 2007; i.e., no later than December 31, 2024.

17 **Q. Have you performed an independent end-of-life analysis for Colstrip Units 3 and 4?**

18 A. No. However, I have reviewed the testimony and depreciation studies provided in both  
19 the current case and in the 2007 case in which the current depreciation schedules were set.  
20 I have reviewed the considerations and projections raised and disputed in the 2007 study,

1 and I have examined, with the benefit of hindsight, how these and other factors have  
2 evolved in the intervening years.

3 I find that Colstrip Units 3 and 4 are not immune to the trends that are affecting the rest  
4 of the industry throughout the United States, including Colstrip Units 1 and 2. Units 3  
5 and 4 are also exposed to these factors, and are unlikely to be able to continue operating  
6 economically beyond the retirement date I have proposed for depreciation purposes.

7 These units will not escape the realities of today's energy market economics just because  
8 PSE assigns them an unrealistically long depreciable life.

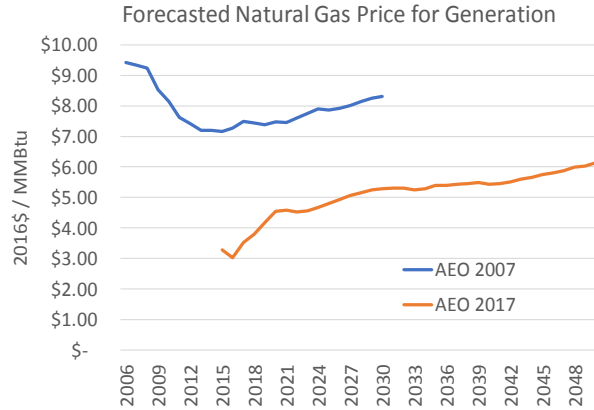
9 **Q. Can you describe some of the factors that have changed the economic outlook for**  
10 **coal plants since PSE's 2007 rate case?**

11 A. A primary factor negatively affecting coal plants is the sea change in the price and  
12 availability of natural gas in the United States. Figure 1 compares the long-range natural  
13 gas price outlook as projected by the US Department of Energy, Energy Information  
14 Administration's (EIA) Annual Energy Outlook (AEO) from 2007 (the year of PSE's last  
15 general rate case) and the most recent EIA forecast, from AEO 2017.<sup>36</sup> It is difficult to  
16 overstate the impact of this revolution in long-term gas price expectations on electricity  
17 markets in general, and specifically on the economic viability of coal plants. Mr. Jones  
18 was projecting economic challenges for the Colstrip units with a gas price outlook that  
19 was significantly more salutary for coal than the picture we see today.

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<sup>36</sup> Both current and previous editions may be found at <https://www.eia.gov/outlooks/aeo/>.

1 **Figure 1. Comparison of US Department of Energy natural gas price forecasts from 2007**  
2 **and 2017.**



3  
4 Other factors, such as the rapidly falling price and greater availability of renewable  
5 energy, the increasing state mandates for renewables and restrictions on coal, and the  
6 dramatic decrease in the rate of electricity demand growth, also could not have been  
7 predicted by Mr. Jones in 2007. In sum, the long-term outlook for coal-fired generators  
8 such as the Colstrip units has only gotten worse since Mr. Jones first projected the  
9 retirements of the Colstrip Units 1 and 2 in 2019 and Units 3 and 4 in 2024 and 2026,  
10 respectively.

11 **Q. Does PSE witness Ronald J. Roberts agree that the persistent drop in the price of**  
12 **gas has made it difficult for coal plants to compete?**

13 A. Yes. Mr. Roberts states that “natural gas is now generally cheaper to extract and transport  
14 than coal. The development of a cheaper and more readily available energy source has  
15 sharply driven down the price of energy. In fact, the price has fallen below the profit

1 margin of producing coal at many older plants.”<sup>37</sup>

2 **Q. In defending end-of-life dates of 2024 and 2026 for Colstrip Units 3 and 4 in his**  
3 **rebuttal testimony in Docket No. UE-072300, did PSE witness Michael Jones discuss**  
4 **the competition from low-cost natural gas as a factor in setting his recommended**  
5 **end-of-life dates for the Colstrip units?**

6 A. No. The widespread use of hydraulic fracturing for petrochemicals like natural gas in the  
7 United States was just getting started at the time of PSE’s 2007 rate case, and the long-  
8 term impacts of this process on the price and availability of natural gas were not widely  
9 anticipated at that time. Figure 1, above, illustrates the dramatic change in outlook  
10 between 2007 and the present. Mr. Jones was projecting 2024 and 2026 retirement dates  
11 under the assumption of far higher costs for replacement energy, and thus much stronger  
12 economics, for the Colstrip units.

13 **Q. Did Mr. Jones discuss challenges with the coal supply for Colstrip Units 3 and 4?**

14 A. No. Mr. Jones only addressed coal supply issues for Units 1 and 2. The owners of these  
15 units had only just negotiated a coal supply agreement with the Rosebud mine,<sup>38</sup> giving  
16 Mr. Jones the confidence that these units could run until his projected retirement date. As  
17 Mr. Jones, testified, “Only after the owners of Colstrip Units 1 and 2 obtained a  
18 commitment for a new coal supply agreement with the Rosebud mine did I recommend  
19 extending the terminal dates used in the depreciation study to 2019 for Colstrip Units 1

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<sup>37</sup> Roberts Direct Testimony, Ex. No.\_\_(RJR-1CT), p. 22 at 5-8.

<sup>38</sup> Rebuttal Testimony of Michael Jones in Docket No. UE-072300, p. 7. (Exh. EDH-6).

1 and 2.”<sup>39</sup>

2 **Q. What is the current status of the agreement with Western Energy Company to**  
3 **supply coal for Colstrip Units 3 and 4?**

4 A. According to PSE’s response to Sierra Club Data Request No. 011, this contract, like the  
5 Colstrip 1 and 2 coal supply contract, expires on December 31, 2019.<sup>40</sup> In responding to  
6 this data request PSE objected to Sierra Club’s inquiry about the likely future cost of coal  
7 for these units as “speculative”, as the company was still in negotiations to renew this  
8 contract. In other words, PSE and Talen Energy do not know at this time whether or at  
9 what price they will be able to negotiate a long-term coal supply contract from the  
10 Rosebud Mine for Units 3 and 4.

11 It is likely that the same resource depletion and elevated strip ratio considerations that  
12 triggered termination of the Unit 1 and 2 supply contract also affect the viability and cost  
13 of supply for Units 3 and 4.<sup>41</sup> Westmoreland Coal’s 2016 10-k<sup>42</sup> suggests that the  
14 currently permitted resources of the Rosebud Mine will be exhausted by 2024 – an  
15 estimate acknowledged by PSE in response to Sierra Club Data Request No. 013.<sup>43</sup> This  
16 adds even greater uncertainty to the availability of a viable fuel supply for Units 3 and 4  
17 beyond that year.

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<sup>39</sup> Ibid.

<sup>40</sup> Exh. EDH-7, pp. 9-10.

<sup>41</sup> See, PSE’s response to Sierra Club Data Request No. 008 (Exh. EDH-7, pp. 3-6)

<sup>42</sup> Available at: [https://www.sec.gov/Archives/edgar/data/106455/000010645517000012/wlb-123116\\_10k.htm](https://www.sec.gov/Archives/edgar/data/106455/000010645517000012/wlb-123116_10k.htm)

<sup>43</sup> PSE Response to Sierra Club Data Request No. 013. (Exh. EDH-7, pp. 11-12).

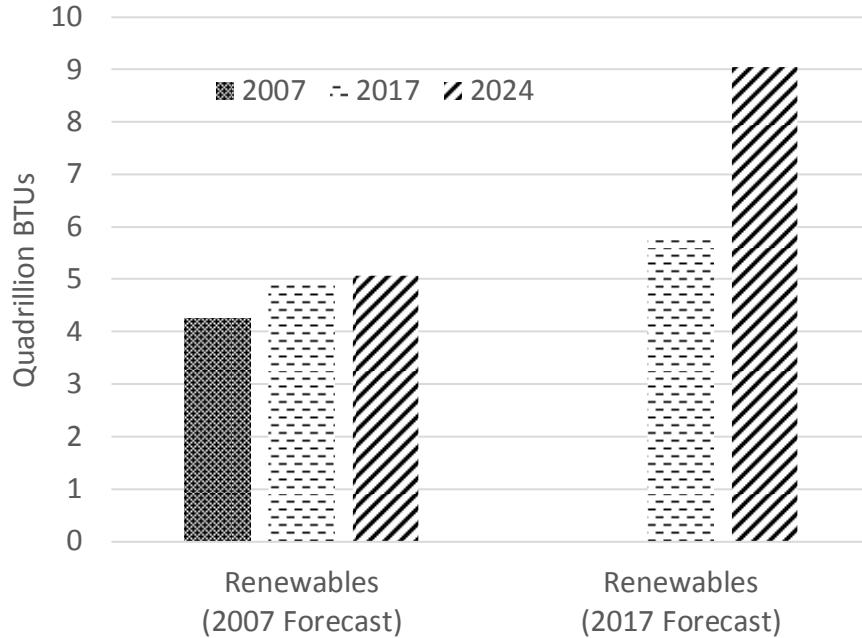


1 **Q. Can you provide any evidence of the general industry expectation for the growth in**  
2 **renewable energy in the United States as of 2007, compared to the expectation**  
3 **today?**

4 A. Yes. The EIA's Annual Energy Outlook (AEO) provides multi-decadal forecasts of  
5 electricity generation sources that are widely considered to be the industry standard.  
6 Figure 2 compares the predictions made in 2007 with expectations from the most recent  
7 edition of the AEO. In the 2007 AEO forecast, EIA predicted modest long-term growth  
8 of renewable energy in the United States, with about 16% increase in output by 2017 and  
9 19% by 2024. The plummeting cost and technological improvements of the intervening  
10 years have changed this outlook considerably, as shown in Figure 3. Given the  
11 availability of updated information, AEO now projects total renewable energy output for  
12 2017 that is about 35% greater than was available 10 years ago, and an increase of 112%  
13 over 2007 levels by 2024 – 78% more than was being forecast for that same year in the  
14 2007 edition.

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**Figure 2. Comparison of Forecasts of US Renewable Energy Output from AEO 2007 and AEO 2017.**



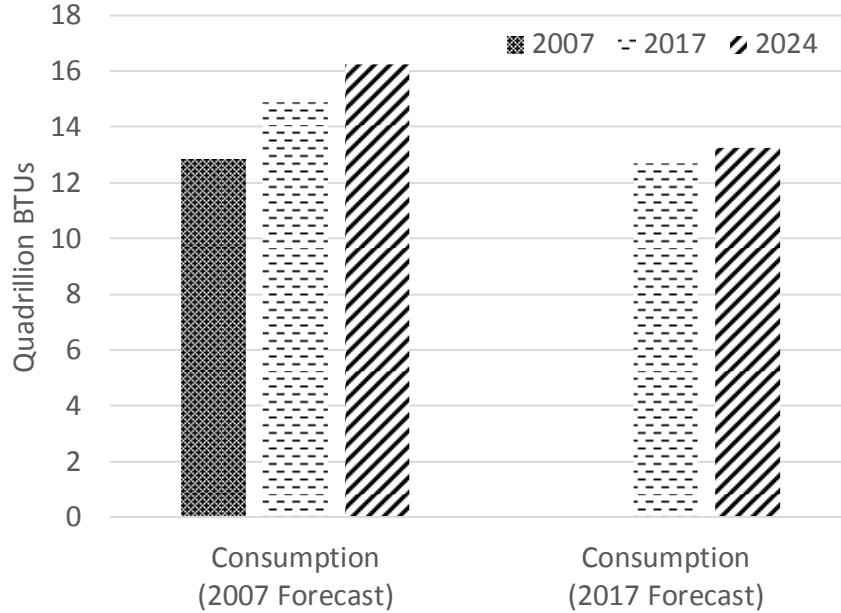
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4 **Q. Can you provide any evidence of the general industry expectation for the growth in**  
5 **overall energy consumption in the United States as of 2007, compared to the**  
6 **expectation today?**

7 A. Yes. The EIA’s Annual Energy Outlook also provides multi-decadal forecasts of  
8 electricity consumption, also widely considered to be the industry standard. Figure 3  
9 compares the electricity use predictions made in 2007 with expectations from the most  
10 recent AEO. In 2007, AEO was projecting that energy use would increase by about 16%  
11 by 2017, and by about 27% by 2024. In fact, AEO’s latest prediction for the current year  
12 2017 is that energy use will be about 1% lower than it was in 2007, and use in 2024 will  
13 be about 3% higher than in 2007.

1  
2

**Figure 3. Comparison of Forecasts of Total US Electricity Consumption from AEO 2007 and AEO 2017.**



3

4 **Q. Have there been any significant policy changes in Washington and the surrounding**  
5 **states since the 2007 study that might affect the long-term viability of Colstrip Units**  
6 **3 and 4 as a source of electric energy in the west?**

7 A. Yes. Although the Washington Renewable Portfolio Standard (RPS) requiring that 15%  
8 of energy sold by the state's utilities come from renewables by 2020<sup>44</sup> was already in  
9 place as of 2006, the renewable energy requirements in the region have continued to  
10 increase. For example, in 2015 California set a requirement of 50% renewable energy by  
11 2050 along with interim goals along the way, an Oregon has a goal of 25% renewable by  
12 2025 and 50% renewable by 2040 for its larger utilities. California also places strict  
13 limits on the import of coal-based energy, and imposes its statewide carbon tax on

<sup>44</sup> See <http://www.commerce.wa.gov/growing-the-economy/energy/energy-independence-act/> for an overview.

1 imports.

2 In 2014, Washington Governor Jay Inslee issued Executive Order 14-04<sup>45</sup> establishing a  
3 Governor's Carbon Emissions Reduction Taskforce tasked to "establish a cap on carbon  
4 pollution emissions, with binding requirements to meet our statutory emission limits, and  
5 it must include the market mechanisms needed to meet the limits in the most effective  
6 and efficient manner possible."<sup>46</sup> Executive Order 14-04 also directed the Governor's  
7 Legislative Affairs and Policy Office to "seek negotiated agreements with key utilities  
8 and others to reduce and eliminate over time the use of electrical power produced from  
9 coal." And to "engage key electrical utilities that generate electricity through coal-fired  
10 facilities located outside the state and that rely on this electricity to meet their  
11 Washington electrical loads, with the objective of reducing overall greenhouse gas  
12 emissions from the generation of electricity."<sup>47</sup>

13 Even closer to home for PSE, King County issued its "Strategic Climate Action Plan" in  
14 November 2015.<sup>48</sup> Among other things, the plan set a goal to reduce countywide  
15 greenhouse gas emissions by phasing out coal-fired electricity by 2025.<sup>49</sup> King County  
16 residents and businesses make up roughly half of PSE's customer base.<sup>50</sup>

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<sup>45</sup> Available at [http://www.governor.wa.gov/sites/default/files/exe\\_order/eo\\_14-04.pdf](http://www.governor.wa.gov/sites/default/files/exe_order/eo_14-04.pdf).

<sup>46</sup> Ibid, pp. 2-3.

<sup>47</sup> Ibid, p. 4.

<sup>48</sup> Available at: [http://your.kingcounty.gov/dnrp/climate/documents/2015\\_King\\_County\\_SCAP-ActionPlan-Section1.pdf](http://your.kingcounty.gov/dnrp/climate/documents/2015_King_County_SCAP-ActionPlan-Section1.pdf)

<sup>49</sup> Ibid., p.27

<sup>50</sup> PSE 2015 IRP, Chapter 1, p.1-8.

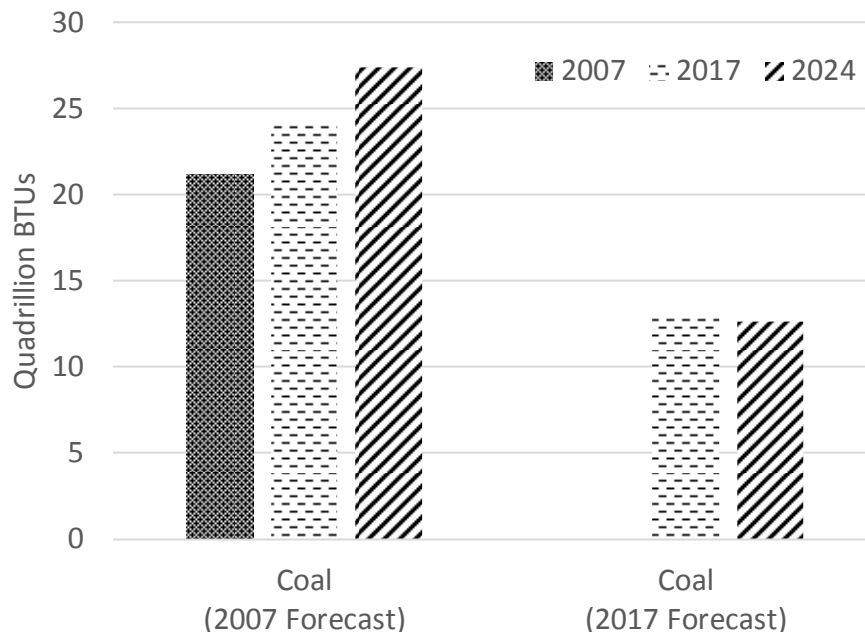
1 **Q. How would you expect the lower price of gas, the higher output of renewables, the**  
2 **near absence of demand growth, and the various state and local policies in favor of**  
3 **cleaner generating sources to affect the projected output from coal units, from**  
4 **today's perspective compared to the perspective of 2007?**

5 A. I, or any knowledgeable analyst looking at these significant industry changes, would  
6 expect that the demand for output from coal plants today and into the future would be  
7 much lower than general industry expectations from 2007.

8 **Q. Is this expectation consistent with the change in the EIA's 2017 vs. 2007**  
9 **predications of electricity generation from coal?**

10 A. Yes. Figure 4 compares the AEO forecasts for coal-fired generation output as of 2007  
11 with those from the most recent edition. In 2007, the AEO was projecting an increase in  
12 output from coal plants of 13.6% by the current year 2017, and 29.3% by 2024. Today  
13 AEO projects a *decrease* of 39.3% this year compared to 2007, and a decrease of 40.3%  
14 in 2024 relative to 2007. Looking just at projections for 2024, the year Mr. Jones  
15 predicted Colstrip Unit 3 would retire, today's expectation for US generation from coal in  
16 that year is 53.9% lower than the expectation for the same year back when Mr. Jones  
17 performed his study.

1 **Figure 4. Comparison of Forecasts of Total US Electricity Generation from Coal from AEO**  
2 **2007 and AEO 2017.**



3

4 **Q. Did Mr. Jones’ 2007 analysis take into account the requirements of the EPA’s**  
5 **Regional Haze Rule?**

6 A. Only to a very limited extent, again because the requirements that would affect the plant  
7 were not known at that time. The EPA published its Federal Implementation Plan (FIP)  
8 for Montana in 2012 that determined Best Available Retrofit Technology (BART)  
9 requirements for Units 1 and 2.<sup>51</sup> Portions of that rule affecting Colstrip were remanded  
10 in a 2015 ruling by the Ninth Circuit Court of Appeals, but the reasonable progress  
11 requirements of the rule – which will affect Units 3 and 4 – remain in place. According to  
12 PSE’s 2015 Integrated Resource Plan (IRP), “The current EPA assessment is that the  
13 state of Montana will require significant emission reductions to meet the natural visibility

<sup>51</sup> 77 Fed. Reg. 57864 (Sep. 18, 2012).

1 goal by 2064 which means that additional emission reductions will be necessary in future  
2 10-year planning periods, beginning in the 2018-2028 period, and there is risk and  
3 uncertainty regarding potential costs.”<sup>52</sup>

4 A recent Regional Haze Rule change extended the next planning period from 2018 to  
5 2021,<sup>53</sup> but otherwise the “reasonable progress” requirements remain in effect. While  
6 litigation challenges or future rule revisions could conceivably change these rules, for  
7 now the reasonable progress component of the Regional Haze Rule is in place. Based on  
8 the best estimates of several Colstrip owners, it appears most likely that SCR would be  
9 required in the mid-2020 timeframe. For example, PacifiCorp’s 2015 IRP included an  
10 assumption that it will incur costs to install SCR at Colstrip 3 and 4 in 2023 and 2022,  
11 respectively.<sup>54</sup> Portland General Electric’s 2016 IRP assumed that SCR would be  
12 required by 2027 in order to meet the “reasonable progress” requirements.

13 Those costs would be substantial. In exhibit RJR-15, PSE witness Ronald Roberts  
14 provided a study by the engineering firm Burns and McDonnell with a total cost estimate  
15 of \$739 million to install SCRs and related equipment on Units 3 and 4.<sup>55</sup> As 25% owner,  
16 PSE would be responsible for \$184,750,000 of this cost. Given the precarious economic  
17 position of Colstrip 3 and 4 today, it is highly unlikely that PSE and the other co-owners  
18 of Colstrip would agree to spend nearly three-quarters of a billion dollars on capital

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<sup>52</sup> PSE 2015 IRP, Appendix K, page K-14.

<sup>53</sup> 82 Fed. Reg. 3078 at 3080 (Jan. 10, 2017).

<sup>54</sup> PacifiCorp 2015 IRP, Vol. 1, Table 7.2 at p. 148. Available at:  
[https://www.pacificorp.com/content/dam/pacificorp/doc/Energy\\_Sources/Integrated\\_Resource\\_Plan/2015IRP/PacifiCorp\\_2015IRP-Vol1-MainDocument.pdf](https://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2015IRP/PacifiCorp_2015IRP-Vol1-MainDocument.pdf).

<sup>55</sup> Ex. No.\_\_( RJR-15), Table 1 on p. 3.

1 expenditures in the 2022-2027 timeframe. It is therefore likely that any requirement to  
2 install SCR would instead trigger a decision to retire those units.

3 **Q. Given the updated information you have provided regarding the general outlook for**  
4 **coal-fired generation and risks specific to Colstrip Units 3 and 4, what is your**  
5 **conclusion and recommendation regarding the depreciation end-of-life assumption**  
6 **for these units?**

7 A. I find that Mr. Jones' proposed end-of-life assumption was reasonable as of 2007, but that  
8 given updated information such as the issues I have discussed, the long-term prospects  
9 for Colstrip Units 3 and 4 have deteriorated. Thus I recommend a depreciation schedule  
10 with an end-of-life set no later than December 31, 2024.

11 **Q. What effect will using a shorter depreciable life have on PSE's revenue**  
12 **requirements in this case?**

13 A. On balance, a shorter depreciation schedule leads to increased revenue requirement in the  
14 test year and – all things equal – a greater rate increase. In this case, I estimate that  
15 changing the retirement date to 2024 will result in an increase in annual revenue  
16 requirements of approximately \$16 million.<sup>56</sup> However, in the long run an accelerated  
17 depreciation schedule will save ratepayers money by paying down the assets faster and  
18 reducing carrying costs, as well as enabling more deliberative planning for alternative  
19 sources of supply. Moreover, if the Commission does not accelerate the depreciation rate

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<sup>56</sup> This estimate is based on data provided in attachment B to WUTC Data Request 12. Depreciating the same book value over 7.6 years instead of 17.2 years (Unit 3) or 17.3 years (Unit 4) results in a total increase in annual depreciation of \$16.47 Million.



1 and it becomes evident at a later date that Colstrip 3 and 4 will in fact retire early, as I  
2 deem likely, then the revenue requirement impact of accelerating depreciation will be  
3 even greater. In other words, increasing the revenue requirement today will avoid an even  
4 greater rate shock in the future.

5 **Q. Why is it important to align the depreciation schedule with a more realistic**  
6 **retirement date?**

7 A. Aligning the depreciation schedule with a realistic estimate of the retirement dates  
8 appropriately balances ratepayer and shareholder interests. Given the likelihood that  
9 Colstrip Units 3 and 4 will retire sooner than the end of the currently proposed  
10 depreciation schedule, accelerating their depreciation protects the interests of utility  
11 shareholders by allowing recovery of plant assets during the life of the plant.

12 Accelerating depreciation also protects ratepayers by minimizing the risk of  
13 intergenerational cost shifting between current ratepayers who are continuing to receive  
14 power from the plant, and future ratepayers who would otherwise be required to pay off  
15 undepreciated assets after the plant has stopped providing power. This risk of  
16 intergenerational inequities is highlighted by the situation currently facing PSE and its  
17 ratepayers with respect to Colstrip Units 1 and 2.

18 In the case of Colstrip Units 1 and 2, there is not enough time to adjust the depreciation  
19 schedule to fully depreciate the plant before its expected retirement in 2022 (or earlier)  
20 without causing unacceptable rate shock. The Commission is therefore left to choose  
21 between either (1) forcing future customers to pay for a plant that is not providing any

1 benefit to them, or (2) forcing PSE shareholders to absorb the stranded assets at the end  
2 of the Colstrip Unit 1 and 2's useful lives, or some combination of the two. In the current  
3 rate case, PSE may be able to offset the anticipated rate by "repurposing" funds that were  
4 due to ratepayers anyway from regulatory liabilities. That will not be possible in the case  
5 of Units 3 and 4. Accelerating the depreciation schedule for these units in the current rate  
6 case will help to avoid serious rate shock and intergenerational inequity in the future.

7 **Q. Are you recommending that the Commission pre-judge the retirement of Colstrip**  
8 **Units 3 and 4?**

9 A. No. I am recommending that the Commission set depreciation expense for Colstrip Units  
10 3 and 4 at a rate that best approximates the *likely* retirement date of those units. As the  
11 retirement date approaches, a future Commission would be free to reevaluate the  
12 expected life of Colstrip and make changes to the depreciation schedule that reflected that  
13 updated information. If in the coming years it appears more likely that Colstrip will run  
14 longer, then the Commission can extend the depreciation schedule, as it did in 2007. It is  
15 also "easier" to extend a depreciation schedule because doing so does not create the  
16 potential for rate shock. The Commission should set accurate depreciation schedules  
17 based on the best available information at the time, which in this case is a date of  
18 December 31, 2024, but on balance it is preferable to err on the side of faster depreciation.

19 **Q. How often should the Commission reevaluate the depreciation schedule at Colstrip?**

20 A. In the past, the Commission's practice has been to evaluate depreciation every five years.  
21 PSE provided depreciation studies in its 2007, 2012 and this 2017 rate cases. Regardless

1 of whether the Commission adopts my recommendation to set the depreciation schedule  
2 at 2024, or PSE's proposal to set it at 2035, or to keep the existing schedule of 2044/2045,  
3 I recommend that the Commission require the Company to file an updated depreciation  
4 study for Colstrip more frequently. This more frequent update will allow PSE and the  
5 Commission to more accurately revise the depreciation schedule at Colstrip as more  
6 current information becomes known.

7 **VI. Recommendations**

8 **Q. What are your recommendations for this Commission regarding decommissioning  
9 costs for Colstrip Units 1 and 2?**

10 A. The Commission should accept PSE's proposal to "fund" the decommissioning and  
11 remediation of Colstrip Units 1 and 2 by reassigning its outstanding treasury grants and  
12 tax credits from a regulatory liability account to a FERC 108 account. However, the  
13 treasury grants and tax credits should not be applied to pay down any undepreciated plant  
14 balance. PSE should bear some of the costs associated with its poor planning for the  
15 shutdown of Colstrip Units 1 and 2. Once Units 1 and 2 stop providing service to PSE  
16 customers, whether that occurs in 2022 or sooner, the commission should require PSE to  
17 remove any undepreciated plant balance for Colstrip Units 1 and 2 from rate base and to  
18 create a separate regulatory asset for those amounts. Given that those assets will no  
19 longer be "used and useful," and to encourage better planning with future depreciation  
20 schedules, the Commission should not allow the Company to recover its full authorized  
21 rate of return on that regulatory asset. I recommend that the Commission authorize

1 recovery of the remaining plant balance only, without allowing a recovery of its cost of  
2 capital on that balance.

3 **Q. What are your recommendations for this Commission regarding the depreciation**  
4 **schedule for Colstrip Units 3 and 4?**

5 A. The Commission should reject PSE's proposed depreciation timeline for Colstrip Units 3  
6 and 4, and instead base the depreciation schedule for these units on an estimated  
7 retirement date no later than December 31, 2024. This date is more consistent with the  
8 Company's proposal from 2007, adjusted by the updated realities of the electricity  
9 marketplace. By my estimation, this will result in a short-term increase in annual revenue  
10 requirements of approximately \$16 million; however, rectifying the depreciation schedule  
11 now will significantly reduce ratepayers' exposure to Colstrip's liabilities. Otherwise,  
12 there is a high likelihood that PSE will find itself with a large undepreciated balance and  
13 inadequate funds for decommissioning and remediation when Units 3 and 4 ultimately  
14 retire.

15 I further recommend that the Commission direct PSE to limit its expenditures on Colstrip  
16 units 3 and 4 to routine maintenance and operations expenditures consistent with an end  
17 of life date no later than December 31, 2024.

18 Finally, I recommend that regardless of the depreciation schedule adopted by the  
19 Commission in this docket, the Commission should require more frequent updates and  
20 adjustments to depreciation rates as Colstrip Units 3 and 4 near their expected end of life  
21 date. In addition to the current practice of evaluating the depreciation schedule every five

1 years, the Commission should direct the Company to conduct a routine end of life  
2 assessment between those depreciation filings, or at intervals of no more than three years.  
3 These more frequent updates will allow the Company and the Commission to make  
4 adjustments to depreciation rates at Colstrip 3 and 4 based on updated end-of-life  
5 assumptions, and will prevent the depreciation schedule from straying too far from the  
6 units' actual useful lives.

7 **Q. Does this conclude your testimony?**

8 A. Yes.