EXH. CLS-5
DOCKET UE-191037
COLSTRIP UNIT 4 SALE
WITNESS: CINDY L. SONG

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Application of **PUGET SOUND ENERGY** **For an Order Authorizing the Sale of All of Puget Sound Energy's Interests in Colstrip Unit 4 and Certain of Puget Sound Energy's Interests in the Colstrip Transmission System**	**Docket UE-191037**

FOURTH EXHIBIT (NONCONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY OF

CINDY L. SONG

ON BEHALF OF PUGET SOUND ENERGY

FEBRUARY 19, 2020

PSE Quantitative Analysis Comparing "Business as Usual" Scenario and the "Proposed Sale" Scenario

(August 29, 2019)

Line	(A)	(B) Scenario 1 No hedging	(C) Scenario 2 Hedge 95MW
1	**Cost ($ in millions)**		
2	Colstrip unit 4 continuing operations	$209 M	$209 M
3	90MW 5-year PPA + 95MW replacement	$115 M	$148 M
4	**Proposed Sale Benefit**	**$94 M**	**$61 M**
5			
6	**Cost ($/MWh)**		
7	Colstrip unit 4 continuing operations	$45.4/MWh	$45.4/MWh
8	90MW 5-year PPA + 95MW replacement	$24.9/MWh	$31.7/MWh
9	Proposed Sale Benefit ($/MWh)	$20.6/MWh	$13.7/MWh

PSE Quantitative Analysis Comparing "Business as Usual" Scenario and the "Proposed Sale" Scenario

Five-Year Comparison

Line	(A)	(B)	(C)	(D)	(E)	(F)	(G)
	Scenario 1 - no hedging						
			12-month ending				
			May 2021	May 2022	May 2023	May 2024	May 2025
1	**Cost ($ in millions)**	**Present Value**					
2	Colstrip unit 4 continuing operations	$209 M	$51 M	$51 M	$50 M	$51 M	$52 M
3	90MW 5-year PPA + 95MW replacement	$115 M	$30 M	$29 M	$26 M	$26 M	$28 M
4	**Proposed Sale Benefit**	**$94 M**	**$21 M**	**$22 M**	**$24 M**	**$25 M**	**$24 M**
5							
6	**Cost ($/MWh)**	**Average**					
7	Colstrip unit 4 continuing operations	$45.4/MWh	$40.9/MWh	$42.0/MWh	$45.9/MWh	$48.7/MWh	$49.6/MWh
8	90MW 5-year PPA + 95MW replacement	$24.9/MWh	$24.2/MWh	$24.0/MWh	$24.0/MWh	$25.1/MWh	$26.9/MWh
9	Proposed Sale Benefit ($/MWh)	$20.6/MWh	$16.7/MWh	$18.0/MWh	$21.8/MWh	$23.7/MWh	$22.6/MWh
10							
11	**Scenario 2 - hedge 95MW**						
12			12-month ending				
13			May 2021	May 2022	May 2023	May 2024	May 2025
14	**Cost ($ in millions)**	**Present Value**					
15	Colstrip unit 4 continuing operations	$209 M	$51 M	$51 M	$50 M	$51 M	$52 M
16	90MW 5-year PPA + 95MW replacement	$148 M	$39 M	$38 M	$34 M	$33 M	$34 M
17	**Proposed Sale Benefit**	**$61 M**	$12 M	$13 M	$16 M	$18 M	$18 M
18							
19	**Cost ($/MWh)**	**Average**					
20	Colstrip unit 4 continuing operations	$45.4/MWh	$40.9/MWh	$42.0/MWh	$45.9/MWh	$48.7/MWh	$49.6/MWh
21	90MW 5-year PPA + 95MW replacement	$31.7/MWh	$31.4/MWh	$31.5/MWh	$31.4/MWh	$31.8/MWh	$32.7/MWh
22	Proposed Sale Benefit ($/MWh)	$13.7/MWh	$9.5/MWh	$10.6/MWh	$14.5/MWh	$17.0/MWh	$16.9/MWh

Colstrip Unit 4 Continuing Operations

Line	*$ in millions*	12-month ending May 2021	May 2022	May 2023	May 2024	May 2025
1	PSE's share of unit 4 capacity	185 MW	185 MW	185 MW	185 MW	185 MW
2	PSE's take (MWh)	1,245,946	1,213,384	1,090,446	1,046,299	1,048,754
3	Net capacity factor	77%	75%	67%	65%	65%
4						
5	**Colstrip unit 4 operating cost**					
6	Fixed operating expenses	$14 M	$13 M	$12 M	$12 M	$13 M
7	Capital	$3 M	$3 M	$3 M	$3 M	$3 M
8	Coal fixed	$14 M	$15 M	$15 M	$15 M	$15 M
9	Dispatch cost	$17 M	$18 M	$18 M	$18 M	$18 M
10	**Colstrip unit 4 operating cost**	**$48 M**	**$48 M**	**$48 M**	**$48 M**	**$49 M**
11						
12	**PSE Expense**					
13	Property Tax	$3 M	$3 M	$3 M	$3 M	$3 M
14	**Total PSE Expense**	**$3 M**	**$3 M**	**$3 M**	**$3 M**	**$3 M**
15						
16	**Total cost (line 10 + 14)**	**$51 M**	**$51 M**	**$50 M**	**$51 M**	**$52 M**
17						
18	Dispatch cost (line 9 / 2)	$13.6/MWh	$14.8/MWh	$16.5/MWh	$17.2/MWh	$17.2/MWh
19	Cost $/MWh (line 16 / 2)	$40.9/MWh	$42.0/MWh	$45.9/MWh	$48.7/MWh	$49.6/MWh
20						
21	**Total cost NPV (line 16)**	**$209 M**				
22	**Cost $/MWh (5-year average)**	**$45.4/MWh**				

Scenario 1 - No Hedging

Line	*$ in millions*	12-month ending May 2021	May 2022	May 2023	May 2024	May 2025
1	**90 MW NWE PPA**					
2	NWE PPA capacity	90 MW	90 MW	90 MW	90 MW	90 MW
3						
4	Energy (MWh)	606,136	590,295	530,487	509,010	510,205
5	Market price ($/MWh)	$23.6/MWh	$23.0/MWh	$23.4/MWh	$24.4/MWh	$25.4/MWh
6	**PPA cost**	**$14 M**	**$14 M**	**$12 M**	**$12 M**	**$13 M**
7						
8	**95 MW Replacement**					
9	Energy replacement					
10	Replacement energy (MWh)	639,810	623,089	559,959	537,289	538,549
11	Mid-C price ($/MWh)	$23.6/MWh	$23.0/MWh	$23.4/MWh	$24.4/MWh	$25.4/MWh
12	**Energy replacement**	**$15 M**	**$14 M**	**$13 M**	**$13 M**	**$14 M**
13						
14	Replacement capacity winter only					
15	Capacity (MW)	95 MW	95 MW	95 MW	95 MW	95 MW
16	Capacity charge	$12.0/kw-yr	$12.3/kw-yr	$12.6/kw-yr	$12.9/kw-yr	$13.2/kw-yr
17	**Capacity replacement cost**	**$1 M**	**$1 M**	**$1 M**	**$1 M**	**$1 M**
18						
19	**Total cost (line 6+12+17)**	**$30 M**	**$29 M**	**$26 M**	**$26 M**	**$28 M**
20						
21	Total capacity	185 MW	185 MW	185 MW	185 MW	185 MW
22	Total energy MWh	1,245,946	1,213,384	1,090,446	1,046,299	1,048,754
23	Cost $/MWh (line 19 / 22)	$24.2/MWh	$24.0/MWh	$24.0/MWh	$25.1/MWh	$26.9/MWh
24						
25	**Total cost NPV (line 19)**	**$115 M**				
26	**Cost $/MWh (5-year average)**	**$24.9/MWh**				

Scenario 2 - Hedge 95MW

Line	*$ in millions*	12-month ending May 2021	May 2022	May 2023	May 2024	May 2025
1	**90 MW NWE PPA**					
2	NWE PPA capacity	90 MW	90 MW	90 MW	90 MW	90 MW
3						
4	Energy (MWh)	606,136	590,295	530,487	509,010	510,205
5	Market price ($/MWh)	$23.6/MWh	$23.0/MWh	$23.4/MWh	$24.4/MWh	$25.4/MWh
6	**PPA cost**	**$14 M**	**$14 M**	**$12 M**	**$12 M**	**$13 M**
7						
8	**95 MW Replacement**					
9	Energy replacement					
10	Replacement energy (MWh)	639,810	623,089	559,959	537,289	538,549
11	Mid-C price ($/MWh)	$37.5/MWh	$37.5/MWh	$37.5/MWh	$37.5/MWh	$37.5/MWh
12	**Energy replacement**	**$24 M**	**$23 M**	**$21 M**	**$20 M**	**$20 M**
13						
14	Replacement capacity winter only					
15	Capacity (MW)	95 MW	95 MW	95 MW	95 MW	95 MW
16	Capacity charge	$12.0/kw-yr	$12.3/kw-yr	$12.6/kw-yr	$12.9/kw-yr	$13.2/kw-yr
17	**Capacity replacement cost**	**$1 M**	**$1 M**	**$1 M**	**$1 M**	**$1 M**
18						
19	**Total cost (line 6+12+17)**	**$39 M**	**$38 M**	**$34 M**	**$33 M**	**$34 M**
20						
21	Total capacity	185 MW	185 MW	185 MW	185 MW	185 MW
22	Total energy MWh	1,245,946	1,213,384	1,090,446	1,046,299	1,048,754
23	Cost $/MWh (line 19 / 22)	$31.4/MWh	$31.5/MWh	$31.4/MWh	$31.8/MWh	$32.7/MWh
24						
25	**Total cost NPV (line 19)**	**$148 M**				
26	**Cost $/MWh (5-year average)**	**$31.7/MWh**				