

**Exh. ASR-8
Docket UE-200115
Witness: Andrew S. Rector**

**BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION**

In the Matter of the Application of

DOCKET UE-200115

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**

**EXHIBIT TO
TESTIMONY OF**

Andrew S. Rector

**STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION**

Expected Greenhouse Gas Emissions Reductions

October 2, 2020

**Expected Reduction in Emissions
(MT of CO₂)**

	[1]	[2]	[3]	[4]	[5]	[6]
		Year 1	Year 2	Year 3	Year 4	Year 5
[A]	Average Emissions of PSE's Share of Unit 4 (MT of CO ₂)	1,295,360	1,295,360	1,295,360	1,295,360	1,295,360
[B]	Average Annual Emissions of NWE PPA (MT of CO ₂)	630,175	630,175	630,175	630,175	630,175
[C]	Expected Emissions of Replacement Market Purchases (MT of CO ₂)	279,597	272,290	244,702	234,795	235,346
[D]	Expected Emissions of Replacement Peaking Resource (MT of CO ₂)	51,438	64,172	57,490	48,034	35,175
[E]	Expected Reduction in Emissions (MT of CO ₂) [E] = [A] - ([B] + [C] + [D])	334,150	328,723	362,992	382,355	394,664

[F]	Expected Reduction in Emissions (MT of CO ₂) [F] = ([E][2] + [E][3] + [E][4] + [E][5] + [E][6]) ÷ 5	360,577
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Source : Submitted by PSE as Attachment A to WUTC data request #31.

Annual Emissions Output of Colstrip Unit (Metric Tons of CO₂)

[A] Year	[B] Total Annual Output (Metric Tons of CO ₂)	[C] PSE Share of Annual Output (Metric Tons of CO ₂) [C] = [B] × 25%
2011	4,396,886	1,099,222
2012	5,047,703	1,261,926
2013	6,221,788	1,555,447
2014	4,838,129	1,209,532
2015	5,798,687	1,449,672
2016	5,347,319	1,336,830
2017	4,697,419	1,174,355
2018	5,027,258	1,256,815
2019	5,257,764	1,314,441
Annual Average	5,181,439	1,295,360

Source : Submitted by PSE as Attachment A to WUTC data request #31.

Average Annual Emissions of NWE PPA (MT of CO₂)

[1]	[2]	[3]	[4]	[5]	[6]
	Year 1	Year 2	Year 3	Year 4	Year 5
[A] Average Emissions of PSE's Share of Unit 4 (MT of CO₂)	1,295,360	1,295,360	1,295,360	1,295,360	1,295,360
[B] Capacity of PSE's Current Share of Unit 4 (MW)	185	185	185	185	185
[C] Capacity of NWE PPA (MW)	90	90	90	90	90
[D] Ratio of Capacity of NWE PPA to Capacity of PSE's Current Share of Unit 4 [D] = [C] ÷ [B]	0.4865	0.4865	0.4865	0.4865	0.4865
[E] Average Annual Emissions of NWE PPA (MT of CO₂) [E] = [A] × [D]	630,175	630,175	630,175	630,175	630,175

Source : Submitted by PSE as Attachment A to WUTC data request #31.

Expected Emissions of Replacement Market Purchases (MT of CO₂)

	[1]	[2]	[3]	[4]	[5]	[6]
		Year 1	Year 2	Year 3	Year 4	Year 5
[A]	Expected Replacement Market Purchases¹ (MWh)	639,810	623,089	559,959	537,289	538,549
[B]	Average Emissions for Market Purchases (MT/MWh)	0.437	0.437	0.437	0.437	0.437
[C]	Expected Emissions of Replacement Market Purchases (MT of CO₂) [C] = [A] × [B]	279,597	272,290	244,702	234,795	235,346

¹ Song, Exh. CLS-5, at page 4, line 10

Source : Submitted by PSE as Attachment A to WUTC data request #31.

Expected Emissions of Replacement Peaking Resource (MT of CO₂)

	[1]	[2]	[3]	[4]	[5]	[6]
		Year 1	Year 2	Year 3	Year 4	Year 5
[A]	Expected Emissions of Replacement Peaking Resource (Tons)	56,680	70,711	63,349	52,929	38,759
[B]	Conversion Factor (Tons to Metric Tons)	0.908	0.908	0.908	0.908	0.908
[C]	Expected Emissions of Replacement Peaking Resource (MT of CO₂) [C] = [A] × [B]	51,438	64,172	57,490	48,034	35,175

Peaker CO2 Emissions

MWh	96,696	120,633	108,072	90,297	66,123
Heat Rate MMBTU/MWH	10.002	10.002	10.002	10.002	10.002
BTU	967,153	1,206,571	1,080,936	903,151	661,362
lbs/mmbtu	117	117	117	117	117
lbs	113,156,947	141,168,838	126,469,529	105,668,619	77,379,383
Tons	56,578	70,584	63,235	52,834	38,690
Conversion Factor	0.908	0.908	0.908	0.908	0.908
Emissions (MT of CO₂)	51,346	64,057	57,387	47,948	35,112

Small difference as result of performing the calculation on annual versus the hourly calculation in Aurora

Source : Submitted by PSE as Attachment A to WUTC data request #31 and Attachment A to NWECC data request #2.