

## Appendix D: Electric Resources



Figure D-20: Generic Renewable Resource Cost Assumptions

2016 \$	UNITS	WA WIND	MT WIND	BIOMASS	SOLAR	OFFSHORE WIND
ISO Capacity Primary	MW	100	300	15	25	100
Winter Capacity Primary	MW	9	192	0	0	
Capacity Credit	%	9%	64%	0%	1%	
Operating Reserves	%	3%	3%	3%	3%	3%
Capacity Factor	%	30%	46%	85%	27%	35%
Capital Cost <sup>1</sup>	\$/kW	\$1,936	\$2,065 <sup>6</sup>	\$3,950	\$2,041	\$7,150 <sup>7</sup>
O&M Fixed	\$/kW-yr	\$27.12	\$33.79	\$113.70	\$10.00	\$77.30
O&M Variable <sup>2</sup>	\$/MWh	\$3.15	\$3.50	\$5.66	\$0.00	\$3.15
Degradation	%/year				0.5%	
Location		SE WA	Montana	Western WA	PSE - Central WA	Coast of WA
Fixed Transmission <sup>3</sup>	\$/kW-yr	\$35.88	\$72.94	\$21.48	\$0.00	\$35.88
Variable Transmission <sup>4</sup>	\$/MWh	\$1.85	\$1.85	\$0.35	\$0.00	\$1.85
Loss Factor to PSE	%	1.9%	7.3%	1.9%	0.0%	1.9%
Heat Rate – Baseload (HHV)	Btu/kWh				13,500	
Emissions:						
NO <sub>x</sub>	lbs/MMBtu				0.00	
SO <sub>2</sub>	lbs/MMBtu				3.152	
CO <sub>2</sub>	lbs/MMBtu				195.0	
First Year Available <sup>5</sup>		2020	2022	2021	2020	2022
Economic Life	Years	25	25	35	25	25
Greenfield Dev. & Const. Leadtime	years	3	3	4	3	5

### NOTES

1. Solar PV cost for AC installed
2. Idaho Solar includes Spin and Supplemental from Idaho Power. WA Wind includes wind integration cost from BPA. MT Wind includes wind integration cost from NWMT. WA solar includes a solar integration charge from BPA as a placeholder.
3. BPAT variable cost includes spin, supplemental and imbalance. Idaho solar includes solar integration cost from Idaho Power.
4. MT wind includes generation tax and WET tax.
5. First year available for MT wind is 2022 to correspond to retirement of Colstrip 1 & 2.
6. Includes \$52 Million of transmission upgrades. If the resource were only 100 MW, then the capital cost would be higher since the transmission upgrades are \$52 million regardless of size of plant.
7. Offshore wind capital cost does not include the cost of the marine cable.