

Sheet2

Year n	actual Build cost	discounted Build cost	actual O&M cost	discounted O&M cost	discounted cumulative cost
\$0.00	\$1,020.00	\$1,020.00	\$37.50	\$37.50	\$1,057.50
\$1.00	0	\$0.00	\$37.50	\$35.71	\$1,093.21
\$2.00	0	\$0.00	\$37.50	\$34.01	\$1,127.23
\$3.00	0	\$0.00	\$37.50	\$32.39	\$1,159.62
\$4.00	0	\$0.00	\$37.50	\$30.85	\$1,190.47
\$5.00	0	\$0.00	\$37.50	\$29.38	\$1,219.86
\$6.00	0	\$0.00	\$37.50	\$27.98	\$1,247.84
\$7.00	0	\$0.00	\$37.50	\$26.65	\$1,274.49
\$8.00	0	\$0.00	\$37.50	\$25.38	\$1,299.87
\$9.00	0	\$0.00	\$37.50	\$24.17	\$1,324.04
\$10.00	0	\$0.00	\$37.50	\$23.02	\$1,347.07
\$11.00	0	\$0.00	\$37.50	\$21.93	\$1,368.99
\$12.00	0	\$0.00	\$37.50	\$20.88	\$1,389.87
\$13.00	0	\$0.00	\$37.50	\$19.89	\$1,409.76
\$14.00	0	\$0.00	\$37.50	\$18.94	\$1,428.70
\$15.00	235	\$113.04	\$37.50	\$18.04	\$1,559.78
\$16.00	0	\$0.00	\$37.50	\$17.18	\$1,576.96
\$17.00	0	\$0.00	\$37.50	\$16.36	\$1,593.32
\$18.00	0	\$0.00	\$37.50	\$15.58	\$1,608.90
\$19.00	0	\$0.00	\$37.50	\$14.84	\$1,623.74
\$20.00	0	\$0.00	\$37.50	\$14.13	\$1,637.87
\$21.00	0	\$0.00	\$37.50	\$13.46	\$1,651.33
\$22.00	0	\$0.00	\$37.50	\$12.82	\$1,664.15
\$23.00	0	\$0.00	\$37.50	\$12.21	\$1,676.36
\$24.00	0	\$0.00	\$37.50	\$11.63	\$1,687.99
\$25.00	0	\$0.00	\$37.50	\$11.07	\$1,699.06
\$26.00	0	\$0.00	\$37.50	\$10.55	\$1,709.61
\$27.00	0	\$0.00	\$37.50	\$10.04	\$1,719.65
\$28.00	0	\$0.00	\$37.50	\$9.57	\$1,729.22
\$29.00	0	\$0.00	\$37.50	\$9.11	\$1,738.33
\$30.00	480	\$111.06	\$37.50	\$8.68	\$1,858.07
\$31.00	0	\$0.00	\$37.50	\$8.26	\$1,866.33
\$32.00	0	\$0.00	\$37.50	\$7.87	\$1,874.20
\$33.00	0	\$0.00	\$37.50	\$7.50	\$1,881.70
\$34.00	0	\$0.00	\$37.50	\$7.14	\$1,888.83
\$35.00	0	\$0.00	\$37.50	\$6.80	\$1,895.63
\$36.00	0	\$0.00	\$37.50	\$6.47	\$1,902.11
\$37.00	0	\$0.00	\$37.50	\$6.17	\$1,908.27
\$38.00	0	\$0.00	\$37.50	\$5.87	\$1,914.15
\$39.00	0	\$0.00	\$37.50	\$5.59	\$1,919.74
\$40.00	0	\$0.00	\$37.50	\$5.33	\$1,925.07
\$41.00	0	\$0.00	\$37.50	\$5.07	\$1,930.14
\$42.00	0	\$0.00	\$37.50	\$4.83	\$1,934.97
\$43.00	0	\$0.00	\$37.50	\$4.60	\$1,939.57
\$44.00	0	\$0.00	\$37.50	\$4.38	\$1,943.95
\$45.00	235	\$26.15	\$37.50	\$4.17	\$1,974.28
\$46.00	0	\$0.00	\$37.50	\$3.97	\$1,978.26
\$47.00	0	\$0.00	\$37.50	\$3.79	\$1,982.04
\$48.00	0	\$0.00	\$37.50	\$3.61	\$1,985.65

Sheet2

\$49.00	0	\$0.00	\$37.50	\$3.43	\$1,989.08
\$50.00	0	\$0.00	\$37.50	\$3.27	\$1,992.35
Decommission = 1%	\$1,970.00	\$171.79			\$2,164.14

All values are in units of \$ /kW

Energy source is Onshore wind

Assumed discount rate is 5% /yr

Levelized cost of Power = \$2,164.14 \$ /kW

Capacity Factor = 37.9%

Levelized Cost of Energy – LCOE = $\$2164.14 \div 166.002$ \$13.04 /MWh

	Actual Build cost	Discounted Build cost	Actual O&M cost	Discounted O&M cost	Cumulative cost	Yearly energy
Year n	\$1,020 /kW					average
	\$1,020	\$1,020.00	\$37.50	\$37.50	\$1,057.50	3.320
1	0	0	\$37.50	\$36.76	\$1,094.26	3.320
2	0	0	\$37.50	\$36.04	\$1,130.31	3.320
3	0	0	\$37.50	\$35.34	\$1,165.65	3.320
4	0	0	\$37.50	\$34.64	\$1,200.29	3.320
5	0	0	\$37.50	\$33.96	\$1,234.25	3.320
6	0	0	\$37.50	\$33.30	\$1,267.55	3.320
7	0	0	\$37.50	\$32.65	\$1,300.20	3.320
8	0	0	\$37.50	\$32.01	\$1,332.21	3.320
9	0	0	\$37.50	\$31.38	\$1,363.58	3.320
10	0	0	\$37.50	\$30.76	\$1,394.35	3.320
11	0	0	\$37.50	\$30.16	\$1,424.51	3.320
12	\$91.80	\$72.38	\$37.50	\$29.57	\$1,526.46	3.320
13	\$0.00	\$0.00	\$37.50	\$28.99	\$1,555.45	3.320
14	0	\$0.00	\$37.50	\$28.42	\$1,583.87	3.320
15	0	\$0.00	\$37.50	\$27.86	\$1,611.73	3.320
16	0	\$0.00	\$37.50	\$27.32	\$1,639.05	3.320
17	0	\$0.00	\$37.50	\$26.78	\$1,665.83	3.320
18	0	\$0.00	\$37.50	\$26.26	\$1,692.08	3.320
19	0	\$0.00	\$37.50	\$25.74	\$1,717.83	3.320
20	0	0.00	\$37.50	\$25.24	\$1,743.06	3.320
21	0	0	\$37.50	\$24.74	\$1,767.80	3.320
22	0	0	\$37.50	\$24.26	\$1,792.06	3.320
23	0	0.00	\$37.50	\$23.78	\$1,815.84	3.320
24	\$91.80	57.07	\$37.50	\$23.31	\$1,896.23	3.320
25	0	0	\$37.50	\$22.86	\$1,919.09	3.320
26	0	0	\$37.50	\$22.41	\$1,941.50	3.320
27	0	0	\$37.50	\$21.97	\$1,963.47	3.320
28	0	0	\$37.50	\$21.54	\$1,985.01	3.320
29	0	0	\$37.50	\$21.12	\$2,006.12	3.320
30	\$652.80	360.39	\$37.50	\$20.70	\$2,387.22	3.320
31	0	0	\$37.50	\$20.30	\$2,407.51	3.320
32	0	0	\$37.50	\$19.90	\$2,427.41	3.320
33	0	0	\$37.50	\$19.51	\$2,446.92	3.320
34	0	0	\$37.50	\$19.13	\$2,466.05	3.320
35	0	0	\$37.50	\$18.75	\$2,484.80	3.320
36	0	0	\$37.50	\$18.38	\$2,503.18	3.320
37	0	0	\$37.50	\$18.02	\$2,521.20	3.320
38	0	0	\$37.50	\$17.67	\$2,538.87	3.320
39	0	0	\$37.50	\$17.32	\$2,556.20	3.320
40	0	0	\$37.50	\$16.98	\$2,573.18	3.320
41	0	0	\$37.50	\$16.65	\$2,589.83	3.320
42	\$91.80	\$39.96	\$37.50	\$16.32	\$2,646.12	3.320
43	0	0	\$37.50	\$16.00	\$2,662.12	3.320
44	0	0	\$37.50	\$15.69	\$2,677.81	3.320
45	0	0	\$37.50	\$15.38	\$2,693.19	3.320
46	0	0	\$37.50	\$15.08	\$2,708.27	3.320

Sheet1

47	0	0	\$37.50	\$14.79	\$2,723.06	3.320
48	0	0	\$37.50	\$14.50	\$2,737.55	3.320
49	0	0	\$37.50	\$14.21	\$2,751.76	3.320
50	\$316.20	\$117.48	\$37.50	\$13.93	\$2,883.17	3.320
51	0	0	\$37.50	\$13.66	\$2,896.83	3.320
52	0	0	\$37.50	\$13.39	\$2,910.22	3.320
53	0	0	\$37.50	\$13.13	\$2,923.35	3.320
54	\$91.80	\$31.51	\$37.50	\$12.87	\$2,967.73	3.320
55	0	0	\$37.50	\$12.62	\$2,980.35	3.320
56	0	0	\$37.50	\$12.37	\$2,992.72	3.320
57	0	0	\$37.50	\$12.13	\$3,004.85	3.320
58	0	0	\$37.50	\$11.89	\$3,016.74	3.320
59	0	0	\$37.50	\$11.66	\$3,028.40	3.320
60	0	0	\$37.50	\$11.43	\$3,039.83	3.320
Total BLDG cost	\$2,356.20	Replacements performed			Actual lifetime energy (MWh)	202.52
Decom = 1.25%	\$29.45					
			Levelized Cost of Power (\$/kW)		\$3,069.28	include decom
			All the above values are in units of \$ /kW			
			Levelized Cost of Energy – LCOE (\$/MWh)		\$25.85	Level

Sheet1

			discount
Source is On Shore Wind w/ CF = 37.9%	0.379	3.320	average yearly energy (MWh)
Assumed discount rate is 2% /year			
Levelized Cost of Power in \$ /kW units	\$3,069.28		from Column F above, after year 60
Conversion factor from Power to Actual Energy	0.00502002		for CF = 0.379 Conversion = 1 ÷ (CF x 8760 h /yr x 60)
Levelized Cost of Energy	\$25.85 /MWh	LCOE	

Discounted yearly energy	Remarks
in MWh	On Shore Wind @ 2%
3.320	Construction
3.255	completed
3.191	In 1 year
3.129	
3.067	Total CAPEX = \$1,020 /kW
3.007	
2.948	Columns A through F
2.890	are nominal dollars
2.834	per kilowatt
2.778	of peak generating
2.724	capacity
2.670	
2.618	Replace AC converter 9%
2.566	
2.516	
2.467	
2.418	
2.371	
2.325	
2.279	
2.234	Replace blades 31%
2.190	
2.148	
2.105	
2.064	Replace AC converter 9%
2.024	
1.984	
1.945	
1.907	
1.870	
1.833	Replace all hardware = 64%
1.797	Gearbox, generator,
1.762	transformer, converter & blades
1.727	24% + 9% + 31% = 64%
1.693	
1.660	
1.628	
1.596	
1.564	
1.534	
1.504	
1.474	
1.445	Replace AC converter 9%
1.417	
1.389	
1.362	
1.335	

1.309	
1.283	
1.258	
1.233	Replace blades 31%
1.209	
1.186	
1.162	
1.140	Replace AC converter 9%
1.117	
1.095	
1.074	
1.053	
1.032	
1.012	
118.73	Discounted lifetime energy (MWh)

mission from column A

Normalized cost of power

divided by
ted lifetime energy

yrs /1000 kW per MW)