

NET PRESENT VALUE ANALYSIS

BATTERY ENERGY STORAGE SYSTEM

NET PRESENT COST

Inputs

Nominal Capacity (MW)	100
Energy Storage Capacity (MWh)	400

Type	Lithium-Ion
Useful Life (years)	50
Total Installed Cost (\$ x 1,000)	233,400
Augmentation Cost at Year 11 (\$ x 1,000)	16,710
Year 1 Operation and Maintenance Cost (\$ x 1,000)	2,137
Future Decommissioning Costs (% of total project)	10%
Inflation Rate	2%
Corporate Income Tax Rate	31%
Accelerated Capital Cost Allowance Rate	50%
Normal Capital Cost Allowance Rate	8%
Normal Capital Cost Allowance Plant	5%
Debt Ratio	60%
Equity Ratio	40%
Debt Interest Rate	4.91%
Equity Return Rate	9.35%
Weighted Cost of Capital / NPV Rate of Return	6.69%

Base Project Cashflows (\$ x 1,000) - BESS 4-Hr 50-Year							Cumulative NPVs - Base (low), med, high, and 6-Hr BESS				Cum NPV 20-Year BESS
Year	Amort. Inc. Augment	O&M	Debt Interest	Equity Return	Income Taxes	Total	Cum NPV BESS 50-Yr with Augment at Yr 11, 21, 26, 31, 36,41, 46	Cum NPV BESS 50-Yr Aug and Replace (med)	Cum NPV BESS 50-Yr Aug and Replace Costly (high)	Cum NPV BESS 50-Yr 6-Hr BESS	Cum NPV BESS 20-Yr with Yr-11 Augment
1	2,567	2,137	6,367	8,082	17,145	36,299	36,299	39,048	39,048	48,066	39,048
2	5,187	2,073	5,539	7,032	25,291	45,122	78,593	86,520	86,520	104,260	86,520
3	5,187	2,029	5,034	6,391	11,859	30,499	105,389	117,845	117,845	139,673	117,845
4	5,187	1,985	4,729	6,003	5,142	23,046	124,368	140,766	140,766	164,627	140,766
5	5,187	1,942	4,523	5,742	1,784	19,178	139,172	158,979	158,979	184,014	158,979
6	5,187	1,898	4,368	5,545	104	17,102	151,546	174,281	174,281	200,177	174,281
7	5,187	1,854	4,237	5,379	-736	15,922	162,344	187,574	187,574	214,262	187,574
8	5,187	1,854	4,119	5,230	-1,156	15,234	172,029	199,362	199,362	226,877	199,362
9	5,187	1,854	4,008	5,088	-1,366	14,771	180,830	209,916	209,916	238,329	209,916
10	5,187	1,854	3,899	4,950	-1,472	14,419	188,883	219,405	219,405	248,800	219,405
11	6,023	1,854	4,217	5,354	732	18,181	198,401	229,794	229,794	261,595	229,794
12	6,858	1,854	4,064	5,160	-807	17,130	206,807	238,589	238,589	272,834	238,589
13	6,858	1,854	3,906	4,959	-1,448	16,129	214,225	246,234	246,234	282,695	246,234
14	6,858	1,854	3,757	4,770	-1,769	15,469	220,894	252,987	252,987	291,528	252,987
15	6,858	1,854	3,613	4,586	-1,930	14,981	226,948	258,999	258,999	299,526	258,999
16	6,858	1,854	3,471	4,406	-2,011	14,579	232,470	264,368	264,368	306,809	264,368
17	6,858	1,854	3,330	4,228	-2,052	14,219	237,519	269,166	269,166	313,457	269,166
18	6,858	1,854	3,190	4,050	-2,072	13,881	242,138	273,451	273,451	319,532	273,451
19	6,858	1,854	3,051	3,873	-2,083	13,553	246,366	277,272	277,272	325,084	277,272
20	6,858	1,854	2,873	3,647	-806	14,426	250,584	280,672	280,672	330,682	280,672
21	6,858	1,854	2,961	3,758	-1,450	13,982	254,416	286,078	291,484	335,757	
22	6,858	1,854	2,812	3,569	-1,772	13,321	257,838	292,650	304,628	340,269	

Confidential Appendix A – Net Present Cost and Cumulative Net Present Value – BESS Resources Page 3 of 4

23	6,858	1,854	2,667	3,386	-1,933	12,833	260,928	296,987	313,301	344,331
24	6,858	1,854	2,526	3,206	-2,014	12,430	263,733	300,160	319,647	348,010
25	6,858	1,854	2,347	2,979	-773	13,265	266,540	302,681	324,690	351,732
26	6,858	1,854	2,434	3,090	-1,434	12,802	269,078	304,800	328,927	355,090
27	6,858	1,854	2,285	2,900	-1,765	12,132	271,333	306,640	332,608	358,057
28	6,858	1,854	2,140	2,717	-1,931	11,639	273,361	308,272	335,872	360,717
29	6,858	1,854	1,998	2,537	-2,014	11,233	275,195	309,733	338,794	363,116
30	6,858	1,854	1,820	2,310	-774	12,068	277,042	311,046	341,421	365,562
31	6,858	1,854	1,907	2,421	-1,436	11,604	278,707	312,485	344,298	367,761
32	6,858	1,854	1,757	2,231	-1,767	10,934	280,178	313,702	346,733	369,691
33	6,858	1,854	1,613	2,048	-1,933	10,440	281,494	314,761	348,850	371,412
34	6,858	1,854	1,471	1,868	-2,016	10,035	282,679	315,696	350,719	372,958
35	6,858	1,854	1,292	1,641	-776	10,869	283,883	316,528	352,384	374,550
36	6,858	1,854	1,379	1,751	-1,438	10,405	284,963	317,271	353,870	375,973
37	6,858	1,854	1,230	1,562	-1,769	9,735	285,911	317,935	355,199	377,213
38	6,858	1,854	1,086	1,379	-1,935	9,242	286,754	318,529	356,386	378,311
39	6,858	1,854	944	1,198	-2,018	8,836	287,509	319,058	357,444	379,292
40	6,858	1,854	765	971	-778	9,671	288,284	319,528	358,385	380,314
41	6,858	1,854	852	1,082	-1,440	9,207	288,975	320,640	361,422	381,223
42	6,858	1,854	703	892	-1,771	8,537	289,576	321,990	365,114	382,007
43	6,858	1,854	559	709	-1,937	8,043	290,107	322,882	367,551	382,695
44	6,858	1,854	417	529	-2,020	7,638	290,580	323,534	369,334	383,305
45	6,858	1,854	238	302	-780	8,472	291,071	324,052	370,750	383,951
46	6,858	1,854	325	413	-1,442	8,008	291,506	324,488	371,940	384,521
47	6,858	1,854	176	223	-1,773	7,338	291,880	324,866	372,974	385,006
48	6,858	1,854	31	40	-1,939	6,844	292,207	325,201	373,891	385,427
49	6,858	1,854	-110	-140	-2,023	6,439	292,495	325,502	374,712	385,797
50	6,858	1,854	-251	-319	-2,064	6,078	292,750	325,772	375,450	386,121
							\$/kW			
							\$/kW NPC			
Total	322,745	93,644	122,669	155,731	-6,569	688,220	6,882			
NPC	89,369	29,271	57,878	73,478	42,754	292,750	2,927	3,258	3,755	3,861

