

From: Mike Barg <Mike_Barg@mckinsey.com>
Subject: Demand input figures
Sent: Tue, 08 Jan 2019 16:24:34 -0600
To: "Blackshear, Victor L. - Manager Financial Planning & Rates" <blacvl@jea.com>, "Crawford, Juli E. - Director Financial Planning & Analysis" <crawje@jea.com>
Cc: "Sarah Brody" <Sarah_Brody@mckinsey.com>
[20190108 Demand scenario inputs v7.xlsx](#)

[External Email - Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email.]

Victor and Juli,

Please find updated annual inputs for the demand forecast attached (Demand outputs > rows 13 – 15). We are working on the accompanying slide and explanations, and will send an overview of the information in Powerpoint form later this evening.

Regards,
Mike

+=====+

This email is confidential and may be privileged. If you have received it in error, please notify us immediately and then delete it. Please do not copy it, disclose its contents or use it for any purpose.

+=====+

Assumptions		Figures in \$/W Year	2018
Lifetime	20	Module	\$ 0.4
Discount	7%	BOS (hardware)	\$ 0.9
Degradation	0.30%	BOS (soft costs)	\$ 1.6
		Solar Total cost	\$ 2.9
Battery rebate		Battery cost (pack) (\$/kWh)	
Backup value of storage	200	Battery cost (BOS) (\$/kW)	
System size (kW)	5	Battery ratio (kWh:kW)	
Roundtrip efficiency	80%	Battery cost (\$/W)	
		Sample solar size (kW)	7.9
		Sample battery size (kW)	
		Battery:solar ratio	
		Battery cost	
		Battery Battery cost (post-rebate)	
		Total turnkey (solar+storage)	\$ 3.3
		Capacity factor	17.3%
		O&M	12
		ITC	30%
		Cost	\$ 2,460
		Lifetime production	16,846.7
		LCOE	0.146
		Retail marginal rate	0.10
		Export credit	0.03
		Self consumption (not exported)	65%
		kWh exported	2.71
		Value of solar (\$/kwh)	0.077
		Value of storage - export avoidance	0.018
		Value of storage - backup	0.026
		Value of storage (\$/kwh)	0.045
		System value	0.122
		Solar value (\$/kW/year)	117.6
		Storage value - export avoidance (\$/kW/year)	27.9
		Storage value - backup (\$/kW/year)	40.0
		Annual value generated (backup + gen)	185.5
		<i>*Value generation assumes "backup" as monetary value c</i>	
		Payback (solar + storage)	17.9

Sensitivity
LCOE

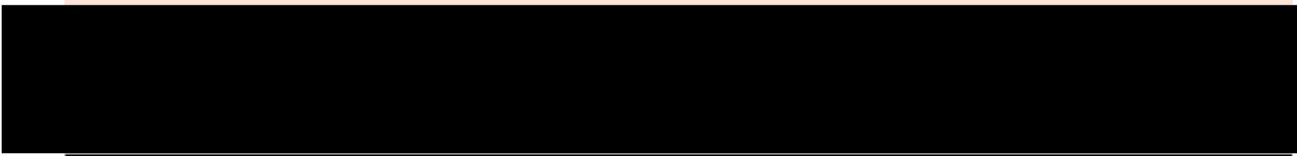
No rebate	0.154
System value	
Backup @ 100	0.109
Backup @ 300	0.135

Discount table

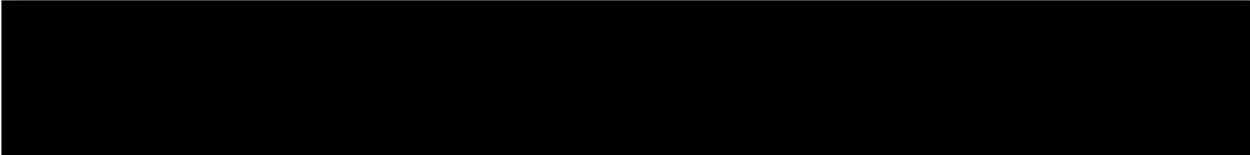
Values:	11.34	11.09
---------	-------	-------

Year	Norm	Degraded
1	1.00	1.00
2	1.00	1.00
3	1.00	0.99
4	1.00	0.99
5	1.00	0.99
6	1.00	0.99
7	1.00	0.98
8	1.00	0.98
9	1.00	0.98
10	1.00	0.97
11	1.00	0.97
12	1.00	0.97
13	1.00	0.96
14	1.00	0.96
15	1.00	0.96
16	1.00	0.96
17	1.00	0.95
18	1.00	0.95
19	1.00	0.95
20	1.00	0.94
21	-	-
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-

	2019	2020	2021	2022	2023	2024	2025	2026
\$	0.4	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.3	\$ 0.2
\$	0.8	\$ 0.8	\$ 0.8	\$ 0.7	\$ 0.7	\$ 0.7	\$ 0.6	\$ 0.6
\$	1.5	\$ 1.3	\$ 1.2	\$ 1.1	\$ 1.0	\$ 0.9	\$ 0.8	\$ 0.7
\$	2.7	\$ 2.5	\$ 2.3	\$ 2.1	\$ 2.0	\$ 1.8	\$ 1.7	\$ 1.6



	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
--	-----	-----	-----	-----	-----	-----	-----	-----



\$	3.1	\$ 2.8	\$ 2.6	\$ 2.4	\$ 2.3	\$ 2.1	\$ 2.0	\$ 1.8
----	-----	--------	--------	--------	--------	--------	--------	--------

17.3% 17.3% 17.3% 17.3% 17.3% 17.3% 17.3% 17.3%

12 12 12 12 12 12 12 12
30% 26% 22% 0% 0% 0% 0% 0%

\$	2,278	\$ 2,220	\$ 2,179	\$ 2,571	\$ 2,400	\$ 2,240	\$ 2,091	\$ 1,967
	16,846.7	16,846.7	16,846.7	16,846.7	16,846.7	16,846.7	16,846.7	16,846.7
	0.135	0.132	0.129	0.153	0.142	0.133	0.124	0.117

0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10
0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03

65% 65% 65% 65% 65% 65% 65% 65%
2.71 2.71 2.71 2.71 2.71 2.71 2.71 2.71

0.079	0.079	0.079	0.079	0.079	0.079	0.079	0.080	0.080
0.019	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.017
0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026
0.045	0.045	0.045	0.044	0.044	0.044	0.044	0.044	0.044
0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124

119.4 119.7 119.9 120.2 120.4 120.7 120.9 121.2
28.3 28.0 27.8 27.5 27.3 27.0 26.8 26.5
40.0 40.0 40.0 40.0 40.0 40.0 40.0 40.0
187.7 187.7 187.7 187.7 187.7 187.7 187.7 187.7

contribution

16.3 15.0 14.0 13.0 12.1 11.2 10.4 9.8

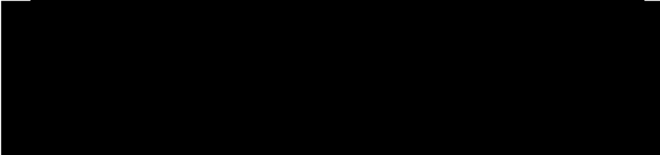
0.142	0.138	0.136	0.160	0.150	0.140	0.130	0.123
0.110	0.112	0.113	0.115	0.116	0.118	0.119	0.121
0.137	0.138	0.140	0.141	0.143	0.144	0.146	0.147

x

	2027	2028	2029	2030
\$	0.2	\$ 0.2	\$ 0.2	\$ 0.2
\$	0.6	\$ 0.6	\$ 0.5	\$ 0.5
\$	0.7	\$ 0.6	\$ 0.6	\$ 0.5
\$	1.5	\$ 1.4	\$ 1.3	\$ 1.2



	7.9	7.9	7.9	7.9
--	-----	-----	-----	-----



\$	1.7	\$ 1.6	\$ 1.5	\$ 1.4
----	-----	--------	--------	--------

17.3% 17.3% 17.3% 17.3%

12 12 12 12
0% 0% 0% 0%

\$	1,851	\$ 1,744	\$ 1,644	\$ 1,550
	16,846.7	16,846.7	16,846.7	16,846.7
	0.110	0.104	0.098	0.092

0.10 0.10 0.10 0.10
0.03 0.03 0.04 0.04

65% 65% 65% 65%
2.71 2.71 2.71 2.71

0.080	0.080	0.080	0.081
0.017	0.017	0.017	0.017
0.026	0.026	0.026	0.026
0.044	0.043	0.043	0.043
0.124	0.124	0.124	0.124

121.5 121.7 122.0 122.3
26.2 26.0 25.7 25.4
40.0 40.0 40.0 40.0
187.7 187.7 187.7 187.7

9.1 8.6 8.0 7.5 x

0.115	0.109	0.103	0.097
0.123	0.124	0.126	0.128
0.149	0.151	0.152	0.154

x

Notes

-5.2%

-4.3%

-9.2%

From Mck battery cost perspective

From Mck battery cost perspective

Tesla Powerwall 2 as basis for ratio

From <https://www.seia.org/research-resources/solar-photovoltaic-technology>

Assuming avg. battery install size grows to 10/20 kw/kwh (Tesla = 13.5 kwh today)

There's a \$2k cap, but cap isn't reached by the time it's economic

PVWatts, Jacksonville, 20* tilt, 10% losses

Source: https://www.jea.com/My_Account/Rates/

Source: https://www.jea.com/My_Account/Rates/