

Atkinson Energy Commission Meeting– September 20, 2022

In Attendance: Stan, Michelle, Jim and Doug

Not in Attendance: Marie & Fred

Minutes (Aug 2022): Doug moved approval, Stan seconded. Approved unanimously

Update on ReVision Solar proposal – Stan

- Not available for a PPA because they need to be over 100kwh
- Proposal includes Inflation Reduction Act rebate of \$47,198, new opportunity for municipalities
- Options for cash outlay or loan included in proposal
- The Commission voted to take proposal to the Library Trustees for their review, highlighting the new IRA rebate to municipalities. Doug moved and Stan seconded motion of support for the proposal.
- ReVision is happy to provide support and presentation to the Library, if needed.

Website Update – Doug

- Talked to Angela and shared changes, updates yet to be made.
- Reviewed LinkedIn and how to create a page, but still evaluating
- Jim mentioned that NHSaves has winter savings tips. Jim will send to Doug to ask for inclusion on Town website.

NH Local Energy Solutions Conference – October 14th

- Stan and Fred will attend for the Commission. Michelle will be there as a presenter. The group will make sure to participate in all sessions of interest to the Town.

Marie – Jim will send requests to Marie re: table at Town Yard Sales. If table is possible, Jim will man and share info. Michelle will look to see if she has any old materials that are still relevant.

Doug motion to adjourn, Stan seconded. Adjourned at 8:08



Town of Atkinson Solar

Preliminary Proposal for Kimball Library PV

Preliminary Proposal Date

September 7, 2022

Solar Design Summary

Project Size (DC)	144 Panels	57.6 kW
Project Size (AC)	3 Inverters	51.9 kW
Annual Generation (kWh)		55,694

Investment Summary

Turnkey System Cost	\$181,531
Utility Interconnection Cost Allowance	\$0
Site/Facility Preparation	\$0
Annual O&M (Recommended)	\$1,009
Investment Tax Credit	-\$47,000
Depreciation Benefits	\$0
Rebate/Grant (est.)	-\$10,000
Net investment	\$125,540

Pricing guaranteed for 30 days. Financing and lease options available.

Engineer's Rendering



5 Academy Ave, Atkinson, NH 03811 (Satellite Data)

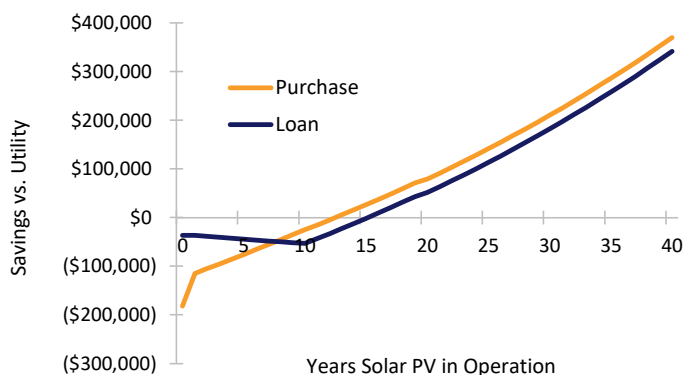
Project Savings/Revenue

Energy Savings (Year 1)	\$9,084
Renewable Energy Credits (Year 1)	\$1,471
Simple Payback	13
25-Year Internal Rate of Return (IRR)	6.33%
25-Year Net Savings (warranty period)	\$141,524
40-Year Net Savings (Commercial Lifespan)	\$369,600

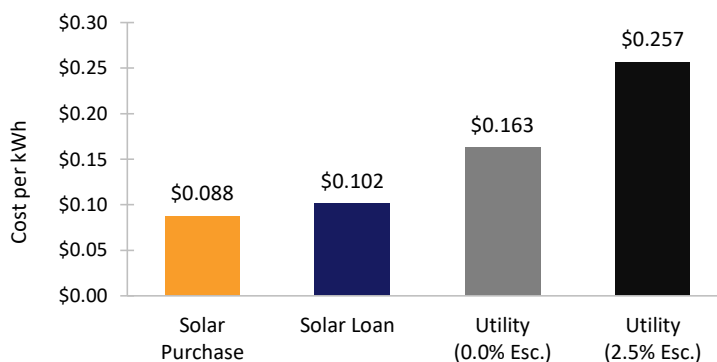
Environmental Benefits

Annual CO2e Offset (pounds)	54,580
Equivalent To...	
Gallons of Gasoline Not Burned	2,786
Passenger Cars Removed From the Road	5
Pounds of Coal Not Burned	27,278
Tons of Waste Recycled	8

Solar Savings vs. Utility



Levelized Cost of Energy (40 Years)



Turnkey Solar Project Cash Flow - Town of Atkinson

System Design	
System Size in kW (DC)	57.60
System Size in kW (AC)	51.90
Annual kWh Generation (Year 1)	55,694
Annual Generation Derate	0.5%
Turnkey System Cost	\$181,531
Utility Interconnection Allowance	\$0
Site/Facility Preparation Allowance	\$0
Total System Cost incl. Allowances	\$181,531
Tax Credit-Ineligible Portion	\$0

Annual Project Expenses	
Operations & Maintenance (O&M)	\$1,009
O&M Annual Escalator	2%
Insurance	\$0
Property Tax (generally exempted)	\$0
Land Lease (third-party owned)	\$0
Metering Fees, MV90 (Maine)	\$0
Inverter Replacement (Year 20 only)	\$3,456

Tax Assumptions	
State	NH
Tax Exempt	No
Investment Tax Credit (ITC)	26%
Bonus Depreciation	Yes
Federal Tax Rate	21.0%
State Tax Rate	7.9%
Total Effective Tax Rate	27.2%
Total Depreciation Benefit	\$0
Tax on Solar Project Income	No
Energy Used for Business	0%

Project Income	
Value of Solar (Y1)	\$0.1631
Utility Escalator	2.5%
Tariff Rate (\$/kWh)	\$0.1551
Tariff Term (years)	0
Y1 REC Volume	56
REC Price (\$/MWh)	\$30.00
REC Term (years)	10
REC Depreciation	5%
Y1 REC Management Fee	\$200
Total REC/Incentive Value	\$11,139

Loan Assumptions	
Loan Amount	\$145,225
Loan Term	10
Down Payment	\$36,306
Interest Rate	5.00%
Year 2 Reamortization	Yes

Net Metering/NEB Assumptions	
Utility Company	Unitil
Utility Rate Class	G-2
Retail Electricity Rate (onsite)	\$0.1631
Net Metering/NEB Rate	\$0.1551
Net Metering/NEB Percent	0%

Year	Generation (kWh)	Value of Solar (kWh)	Avoided Utility Cost/Revenue	REC Value	O&M	Total Project Expense	Grant or Rebate	Tax Credit	Purchase Tax Benefits	Purchase Annual Cash Flow	Purchase Cum. Cash Flow	Annual Loan Payment	Loan Tax Benefits	Loan Annual Cash Flow	Loan Cum. Cash Flow
0										(\$181,531)	(\$181,531)			(\$36,306)	(\$36,306)
1	55,694	\$0.1631	\$9,084	\$1,471	\$1,009	(\$1,009)	\$10,000	\$47,198	\$0	\$66,744	(\$114,787)	(\$18,484)	\$0	\$48,260	(\$36,306)
2	55,415	\$0.1672	\$9,265	\$1,379	\$1,029	(\$1,029)	\$0	\$0	\$0	\$9,615	(\$105,173)	(\$11,814)	\$0	(\$2,200)	(\$38,506)
3	55,138	\$0.1714	\$9,449	\$1,293	\$1,050	(\$1,050)	\$0	\$0	\$0	\$9,692	(\$95,481)	(\$11,814)	\$0	(\$2,123)	(\$40,628)
4	54,863	\$0.1756	\$9,636	\$1,211	\$1,071	(\$1,071)	\$0	\$0	\$0	\$9,777	(\$85,705)	(\$11,814)	\$0	(\$2,038)	(\$42,666)
5	54,588	\$0.1800	\$9,828	\$1,134	\$1,092	(\$1,092)	\$0	\$0	\$0	\$9,869	(\$75,835)	(\$11,814)	\$0	(\$1,945)	(\$44,611)
6	54,315	\$0.1845	\$10,023	\$1,061	\$1,114	(\$1,114)	\$0	\$0	\$0	\$9,970	(\$65,865)	(\$11,814)	\$0	(\$1,844)	(\$46,455)
7	54,044	\$0.1892	\$10,223	\$992	\$1,137	(\$1,137)	\$0	\$0	\$0	\$10,078	(\$55,787)	(\$11,814)	\$0	(\$1,736)	(\$48,191)
8	53,774	\$0.1939	\$10,426	\$927	\$1,159	(\$1,159)	\$0	\$0	\$0	\$10,193	(\$45,594)	(\$11,814)	\$0	(\$1,621)	(\$49,812)
9	53,505	\$0.1987	\$10,633	\$865	\$1,182	(\$1,182)	\$0	\$0	\$0	\$10,315	(\$35,279)	(\$11,814)	\$0	(\$1,499)	(\$51,311)
10	53,237	\$0.2037	\$10,844	\$807	\$1,206	(\$1,206)	\$0	\$0	\$0	\$10,445	(\$24,834)	(\$11,814)	\$0	(\$1,369)	(\$52,681)
11	52,971	\$0.2088	\$11,060	\$0	\$1,230	(\$1,230)	\$0	\$0	\$0	\$9,830	(\$15,005)	\$0	\$0	\$9,830	(\$42,851)
12	52,706	\$0.2140	\$11,280	\$0	\$1,255	(\$1,255)	\$0	\$0	\$0	\$10,025	(\$4,980)	\$0	\$0	\$10,025	(\$32,826)
13	52,443	\$0.2194	\$11,504	\$0	\$1,280	(\$1,280)	\$0	\$0	\$0	\$10,224	\$5,244	\$0	\$0	\$10,224	(\$22,602)
14	52,180	\$0.2248	\$11,732	\$0	\$1,306	(\$1,306)	\$0	\$0	\$0	\$10,427	\$15,671	\$0	\$0	\$10,427	(\$12,175)
15	51,920	\$0.2305	\$11,966	\$0	\$1,332	(\$1,332)	\$0	\$0	\$0	\$10,634	\$26,305	\$0	\$0	\$10,634	(\$1,542)
16	51,660	\$0.2362	\$12,203	\$0	\$1,358	(\$1,358)	\$0	\$0	\$0	\$10,845	\$37,150	\$0	\$0	\$10,845	\$9,304
17	51,402	\$0.2421	\$12,446	\$0	\$1,385	(\$1,385)	\$0	\$0	\$0	\$11,061	\$48,211	\$0	\$0	\$11,061	\$20,364
18	51,145	\$0.2482	\$12,693	\$0	\$1,413	(\$1,413)	\$0	\$0	\$0	\$11,280	\$59,491	\$0	\$0	\$11,280	\$31,644
19	50,889	\$0.2544	\$12,946	\$0	\$1,441	(\$1,441)	\$0	\$0	\$0	\$11,504	\$70,995	\$0	\$0	\$11,504	\$43,149
20	50,634	\$0.2607	\$13,203	\$0	\$1,470	(\$4,926)	\$0	\$0	\$0	\$8,277	\$79,272	\$0	\$0	\$8,277	\$51,425
21	50,381	\$0.2673	\$13,465	\$0	\$1,500	(\$1,500)	\$0	\$0	\$0	\$11,966	\$91,237	\$0	\$0	\$11,966	\$63,391
22	50,129	\$0.2739	\$13,733	\$0	\$1,530	(\$1,530)	\$0	\$0	\$0	\$12,203	\$103,441	\$0	\$0	\$12,203	\$75,594
23	49,879	\$0.2808	\$14,006	\$0	\$1,560	(\$1,560)	\$0	\$0	\$0	\$12,446	\$115,886	\$0	\$0	\$12,446	\$88,040
24	49,629	\$0.2878	\$14,284	\$0	\$1,591	(\$1,591)	\$0	\$0	\$0	\$12,693	\$128,579	\$0	\$0	\$12,693	\$100,733
25	49,381	\$0.2950	\$14,568	\$0	\$1,623	(\$1,623)	\$0	\$0	\$0	\$12,945	\$141,524	\$0	\$0	\$12,945	\$113,678
26	49,134	\$0.3024	\$14,858	\$0	\$1,656	(\$1,656)	\$0	\$0	\$0	\$13,202	\$154,726	\$0	\$0	\$13,202	\$126,880
27	48,889	\$0.3099	\$15,153	\$0	\$1,689	(\$1,689)	\$0	\$0	\$0	\$13,464	\$168,190	\$0	\$0	\$13,464	\$140,344
28	48,644	\$0.3177	\$15,454	\$0	\$1,723	(\$1,723)	\$0	\$0	\$0	\$13,732	\$181,922	\$0	\$0	\$13,732	\$154,075
29	48,401	\$0.3256	\$15,761	\$0	\$1,757	(\$1,757)	\$0	\$0	\$0	\$14,004	\$195,926	\$0	\$0	\$14,004	\$168,080
30	48,159	\$0.3338	\$16,075	\$0	\$1,792	(\$1,792)	\$0	\$0	\$0	\$14,282	\$210,208	\$0	\$0	\$14,282	\$182,362
31	47,918	\$0.3421	\$16,394	\$0	\$1,828	(\$1,828)	\$0	\$0	\$0	\$14,566	\$224,774	\$0	\$0	\$14,566	\$196,928
32	47,679	\$0.3507	\$16,720	\$0	\$1,865	(\$1,865)	\$0	\$0	\$0	\$14,855	\$239,630	\$0	\$0	\$14,855	\$211,783
33	47,440	\$0.3594	\$17,052	\$0	\$1,902	(\$1,902)	\$0	\$0	\$0	\$15,150	\$254,780	\$0	\$0	\$15,150	\$226,934
34	47,203	\$0.3684	\$17,391	\$0	\$1,940	(\$1,940)	\$0	\$0	\$0	\$15,451	\$270,231	\$0	\$0	\$15,451	\$242,385
35	46,967	\$0.3776	\$17,737	\$0	\$1,979	(\$1,979)	\$0	\$0	\$0	\$15,758	\$285,989	\$0	\$0	\$15,758	\$258,143
36	46,732	\$0.3871	\$18,089	\$0	\$2,018	(\$2,018)	\$0	\$0	\$0	\$16,071	\$302,060	\$0	\$0	\$16,071	\$274,214
37	46,498	\$0.3968	\$18,449	\$0	\$2,059	(\$2,059)	\$0	\$0	\$0	\$16,390	\$318,450	\$0	\$0	\$16,390	\$290,604
38	46,266	\$0.4067	\$18,815	\$0	\$2,100	(\$2,100)	\$0	\$0	\$0	\$16,716	\$335,166	\$0	\$0	\$16,716	\$307,319
39	46,035	\$0.4168	\$19,189	\$0	\$2,142	(\$2,142)	\$0	\$0	\$0	\$17,048	\$352,213	\$0	\$0	\$17,048	\$324,367
40	45,804	\$0.4273	\$19,571	\$0	\$2,185	(\$2,185)	\$0	\$0	\$0	\$17,386	\$369,600	\$0	\$0	\$17,386	\$341,753

Pricing guaranteed for 30 days. This financial summary is provided for informational purposes only and is not intended to provide, and should not be relied on for, tax, legal or accounting advice.



Town of Atkinson Solar

Electricity Load and Solar Analysis for Kimball Library PV

Solar Design and Net Metering

Project size (kW DC)	57.60
Year 1 generation (kWh)	55,694
Annual facility consumption	88,220
Annual solar offset	63.1%
Monthly solar net metering (per year)	0%

Utility and Cost Assumptions

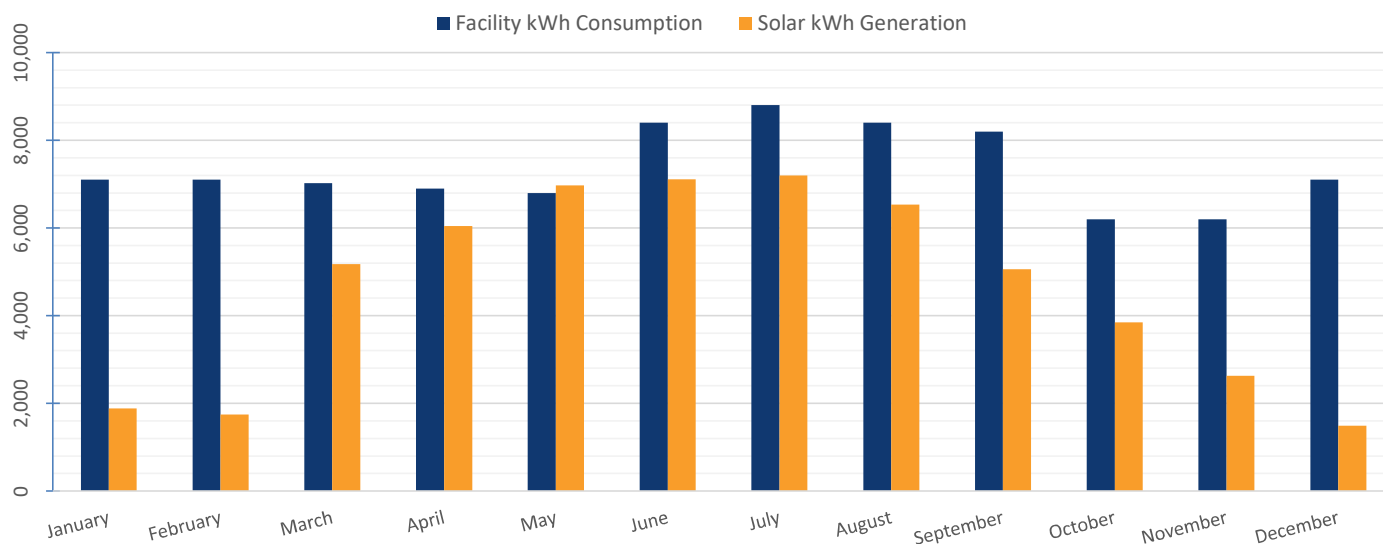
Utility company	Unitil
Utility rate class	G-2
Mandatory utility rate/kWh	\$0.0402
3rd-party supplier	Not Applicable
Supply rate/kWh	\$0.0000
Total electricity cost/kWh	\$0.1631
NE utility inflation, 1990-2018	2.6%
Projected inflation, 2018-2040	2.5%

Monthly Cost and Savings Analysis

Month	Facility kWh Consumption	Current Average Cost	Solar kWh Generation	Future Solar Savings*	Future Average Cost	Monthly Solar Offset
January	7,100	\$1,158	1,886	\$308	\$851	26.6%
February	7,100	\$1,158	1,748	\$285	\$873	24.6%
March	7,020	\$1,145	5,179	\$845	\$300	73.8%
April	6,900	\$1,126	6,042	\$986	\$140	87.6%
May	6,800	\$1,109	6,966	\$1,136	-\$27	102.4%
June	8,400	\$1,370	7,107	\$1,159	\$211	84.6%
July	8,800	\$1,436	7,197	\$1,174	\$262	81.8%
August	8,400	\$1,370	6,537	\$1,066	\$304	77.8%
September	8,200	\$1,338	5,059	\$825	\$513	61.7%
October	6,200	\$1,011	3,848	\$628	\$384	62.1%
November	6,200	\$1,011	2,633	\$429	\$582	42.5%
December	7,100	\$1,158	1,492	\$243	\$915	21.0%
Total	88,220	\$14,391	55,694	\$9,084	\$5,307	63.1%

*Values represent Year 1 savings projections based on expected generation and value of solar. Actual savings may differ.

Monthly Facility Load and Solar Offset



Prelim-Kimball Library Kimball Library -Town of Atkinson, 5 Academy Avenue, Atkinson NH 03811

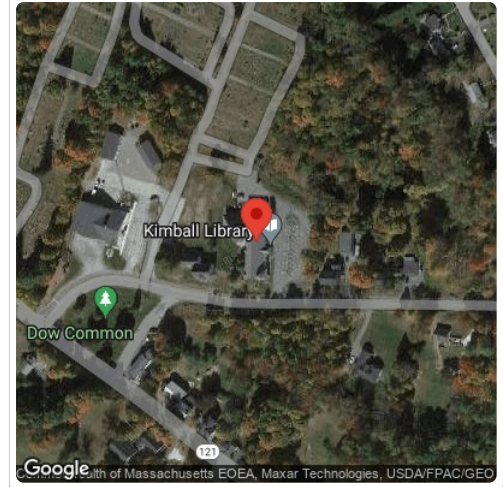
Report

Project Name	Kimball Library -Town of Atkinson
Project Address	5 Academy Avenue, Atkinson NH 03811
Prepared By	Comm Design 2 jen@revisionenergy.com

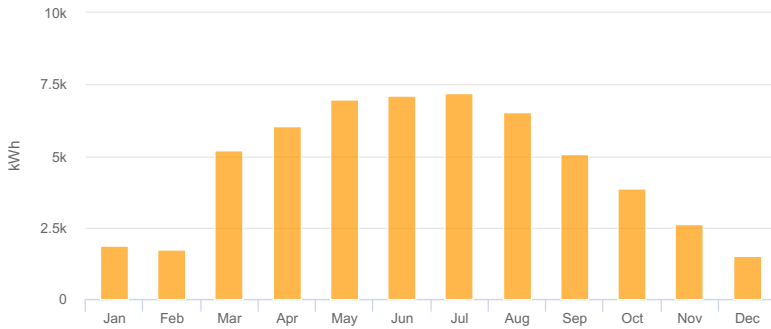
System Metrics

Design	Prelim-Kimball Library
Module DC Nameplate	57.6 kW
Inverter AC Nameplate	51.9 kW Load Ratio: 1.11
Annual Production	55.69 MWh
Performance Ratio	71.3%
kWh/kWp	966.9
Weather Dataset	TMY, CONCORD, NSRDB (tmy2)
Simulator Version	584ec3959c-fcc359c7c9-41f4d01faa-fd97d6d116

Project Location

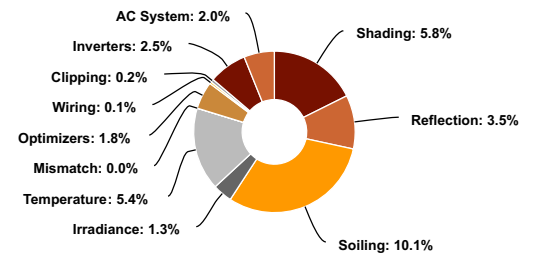


Monthly Production



Month	GHI (kWh/m ²)	POA (kWh/m ²)	Shaded (kWh/m ²)	Nameplate (kWh)	Grid (kWh)
January	60.8	67.1	60.7	1,973.0	1,885.7
February	79.0	81.4	75.0	1,830.8	1,748.0
March	117.3	114.3	106.7	5,606.1	5,178.8
April	144.7	134.1	127.3	6,812.2	6,042.1
May	175.9	158.3	151.6	8,117.1	6,966.2
June	182.5	163.5	157.2	8,418.2	7,106.5
July	186.0	167.2	160.7	8,609.8	7,197.4
August	164.8	152.5	145.4	7,784.0	6,536.9
September	123.0	118.3	110.6	5,903.8	5,058.9
October	86.5	88.1	81.4	4,316.5	3,848.3
November	55.9	59.4	54.1	2,858.7	2,633.0
December	47.2	51.6	46.8	1,569.8	1,492.0

Sources of System Loss






⚡ Annual Production			
	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,423.6	
	POA Irradiance	1,355.8	-4.8%
	Shaded Irradiance	1,277.4	-5.8%
	Irradiance after Reflection	1,232.4	-3.5%
	Irradiance after Soiling	1,107.9	-10.1%
	Total Collector Irradiance	1,107.9	0.0%
Energy (kWh)	Nameplate	63,800.1	
	Output at Irradiance Levels	62,987.0	-1.3%
	Output at Cell Temperature Derate	59,555.4	-5.4%
	Output After Mismatch	59,555.4	0.0%
	Optimizer Output	58,481.8	-1.8%
	Optimal DC Output	58,400.2	-0.1%
	Constrained DC Output	58,287.7	-0.2%
	Inverter Output	56,830.5	-2.5%
	Energy to Grid	55,693.9	-2.0%
Temperature Metrics			
Avg. Operating Ambient Temp		11.1 °C	
Avg. Operating Cell Temp		22.9 °C	
Simulation Metrics			
		Operating Hours	4729
		Solved Hours	4729

☁ Condition Set												
Description	Condition Set 1											
Weather Dataset	TMY, CONCORD, NSRDB (tmy2)											
Solar Angle Location	Meteo Lat/Lng											
Transposition Model	Perez Model											
Temperature Model	Sandia Model											
Temperature Model Parameters	Rack Type		a		b		Temperature Delta					
	Fixed Tilt		-3.56		-0.075		3°C					
	Flush Mount		-2.81		-0.0455		0°C					
	East-West		-3.56		-0.075		3°C					
	Carport		-3.56		-0.075		3°C					
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D
	40.5	55.8	5.4	4	4	4	4	4	4	4	4	38.7
Irradiation Variance	5%											
Cell Temperature Spread	4° C											
Module Binning Range	-2.5% to 2.5%											
AC System Derate	2.00%											
Module Characterizations	Module						Uploaded By		Characterization			
	Q.PEAK DUO BLK ML-G10+ 400 (Hanwha Q Cells)						HelioScope		Spec Sheet Characterization, PAN			
Component Characterizations	Device		Uploaded By					Characterization				

📦 Components		
Component	Name	Count
Inverters	SE17.3KUS (2021) (SolarEdge)	3 (51.9 kW)
Strings	10 AWG (Copper)	12 (856.0 ft)
Optimizers	P401 (SolarEdge)	144 (57.6 kW)
Module	Hanwha Q Cells, Q.PEAK DUO BLK ML-G10+ 400 (400W)	144 (57.6 kW)

🔌 Wiring Zones			
Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	9-13	Along Racking

🏠 Field Segments									
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 2	Flush Mount	Portrait (Vertical)	40°	271.4321°	0.0 ft	1x1	69	69	27.6 kW
Field Segment 3	Flush Mount	Portrait (Vertical)	40°	91.36396°	0.0 ft	1x1	51	51	20.4 kW
Field Segment 4	Flush Mount	Portrait (Vertical)	40°	181.72525°	0.0 ft	1x1			0
Field Segment 3	Flush Mount	Portrait (Vertical)	40°	181°	0.0 ft	1x1	24	24	9.60 kW

 Detailed Layout

