Clean Coalition

Fishers Island Community Microgrid

Initial Feasibility Study

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Executive Summary

- **Pickett Power LLC ("PPL")** proposed development of a 990 kWac solar system on the Pickett Landfill.
- **Fishers Island Electric Corporation ("FIEC")** has stated interest in supporting the project but conveyed several concerns via the Memorandum dated 12/12/24.
- **Clean Coalition** performed this feasibility analysis to provide Pickett Power, FIEC, and the Fishers Island community with a preliminary foundation for discussion. Further engineering will be required to confirm assumptions and finalize design parameters.
- **Clean Coalition analyzed 3 scenarios:**
  1. 990 kWac solar-only system (originally proposed by Pickett Power)
  2. 990 kWac solar + 1,930 kW 2-hour battery energy storage system ("BESS")
  3. 4,950 kWac solar + 9,630 kW 2-hour BESS
- **Conclusion of the analysis:**
  1. <u>990 kWac solar-only system</u> – offers $4.2M in 25-year net savings but no indefinite resilience capabilities, while leading to further technical issues;
  2. <u>990 kWac solar + 1,930 kW 2-hour BESS</u> – offers $6.0M in 25-year net savings, as well as indefinite partial resiliency capabilities, making it the optimal analyzed scenario;
  3. <u>4,950 kWac solar + 9,630 kW 2-hour BESS</u> – offers $24.5M in 25-year net savings and best-in-class indefinite resilience capabilities at the highest net capital outlay; this option would allow to island the local grid with solar + storage and use the diesel generator as a backup power supply only.
- A detailed economic and resiliency factor comparison is presented in slide Economic & Resilience Summary.
- Implementation of the scenarios including BESS will require coordination with the Town of Southold's Board to lift the moratorium currently in place on BESS facilities or receive an exemption for the project.

Background: NWA Regulatory Requirement

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New York Public Service Commission (PSC) Requirements: Under the PSC's guidance and the Reforming the Energy Vision (REV) framework, utilities in New York are required to evaluate non-wires alternatives ("NWAs") such as on-site solar and BESS as part of capital investment planning to ensure ratepayer funds are spent prudently.

PSC Case 14-M-0101 (REV Proceeding): This foundational order directs all New York utilities, including smaller and municipal ones, to identify cost-effective alternatives to traditional infrastructure through Distributed System Implementation Plans (DSIPs), which explicitly include NWA screening.

Avoidance of "Used and Useful" Disallowance: If FIEC does not assess NWAs and proceeds with a traditional infrastructure investment like a subsea cable, the PSC may later disallow cost recovery on the grounds that the asset was not the most prudent or necessary option.

Alignment with NYS Climate Law (CLCPA): Utilities must demonstrate that proposed investments are consistent with the Climate Leadership and Community Protection Act, which mandates GHG reductions and promotes distributed energy resources such as local solar and storage resources.

Justification for Ratepayer Impact: Any infrastructure investment that impacts rates must be justified through a least-cost, most-benefit analysis under the PSC's regulatory scrutiny, which must include a documented evaluation of NWA feasibility.

Note: Lack of expertise with respect to renewable energy generation does not exempt IOUs from considering non-wires alternatives prior to approving transmission and distribution expenditures.

Background: BESS Moratorium

The Town of Southold has enacted and extended a moratorium on Battery Energy Storage System (BESS) facilities, initially effective from April 11, 2023. A seven-member BESS Task Force was established to research industry standards and safety concerns, contributing to the formulation of appropriate local codes. Despite recommendations from the Suffolk County Planning Commission to limit the moratorium to six months, **the Town Board approved a 12-month extension in April 2025,** citing the necessity for additional time to finalize zoning updates and incorporate state-level fire safety recommendations.

Preliminary analysis indicates that coupling the proposed solar project with a battery energy storage system will not only provide additional economic savings for ratepayers as compared to a “solar only” scenario, but should also enhance the safety and operational certainty for FIEC by providing a controllable buffer between the intermittent output of the solar system and the distribution grid. The BESS allows for real-time energy absorption and dispatch, and also enables peak shaving and export limiting, ensuring that power exported to the grid remains within safe parameters.

Critically, the BESS can be programmed to curtail solar export during grid stress events, reducing the risk of overload or system instability. Together, these capabilities give FIEC more granular control over how and when solar power interacts with the grid, effectively turning an intermittent resource into a dispatchable one and thereby mitigating many of the technical concerns that might otherwise delay interconnection approval.

BESS are a safe and proven technology, with tens of thousands of systems deployed across the U.S. Nationally recognized codes and guidelines—such as NFPA 855, UL 9540, UL 9540A, and IEEE 1547—govern everything from fire safety to grid interconnection, ensuring that systems are designed, tested, and operated to minimize risk to people and property. When properly sited and compliant with these standards, BESS facilities have a strong track record of safe performance, making them a low-risk and high-value asset for communities like Southold.

For all of the above reasons, we believe that it is prudent for the Fishers Island community to work with FIEC to pursue an exception to the current moratorium.

Key Modeling Assumptions

Financial Modeling Assumptions*:

- 30% Federal Investment Tax Credit (ITC)
- Federal MACRS** Depreciation with 20% Bonus Depreciation
- State – 10-year straight line depreciation
- No NY State BESS incentives (may or may not be applicable at time of project development)

Notes:

* Federal Investment Tax Credit and Federal MACRS Depreciation assumptions are reliant on Federal policy and may change during project development.

** Modified Accelerated Cost Recovery System (MACRS) – an accelerated depreciation schedule applicable to renewable energy-related capital investments.

Economic & Resilience Summary

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Fishers Island - Solar + BESS Cash Purchase Economic Summary by Scenario*

Scenario	Solar System Size (kWac)	BESS Size	(1) CapEx Outlay	(2) 30% Investment Tax Credit (ITC)	(3) Federal MACRS & Straight Line Depreciation	(4)=1+2+3 CapEx Outlay Net of Benefits	(5) 25-Year Electrical Bill Savings	(6) 25-Year Cumulative OpEx	(7)=4+5+6 25-Year Net Savings
1	990	-	($2,834,330)	$850,299	$949,500	($1,034,531)	$5,773,900	($538,484)	$4,200,885
2	990	1,930 kW / 3,860 kWh	($6,212,388)	$1,863,716	$2,081,150	($2,267,522)	$9,768,970	($1,487,145)	$6,014,303
3	4,950	9,630 kW / 19,260 kWh	($26,861,940)	$8,058,582	$8,998,750	($9,804,608)	$41,740,222	($7,435,726)	$24,499,888

Minimum Solar + BESS + Diesel resilience at year-15 (after 15 years of solar & BESS degradation)

Scenario	Solar System Size (kWac)	BESS Size	BLP Resilience Duration (hours)	MLP Resilience Duration (hours)	BLP % of Indefinite Resilience	MLP % of Indefinite Resilience
1	990**	-	32	25		
2	990	1,930 kW / 3,860 kWh	34	27	10%	5%
3	4,950	9,630 kW / 19,260 kWh	53	39	50%	29%

- Optimal scenario

Notes:

* High-level estimate intended for illustrative purposes;

** 990 kWac solar + diesel generator; this would require a conversation with CMEC in order to confirm that the solar could remain on during an islanded scenario.

SCENARIO ANALYSIS

Scenario 1 – 990 kWac Solar-Only

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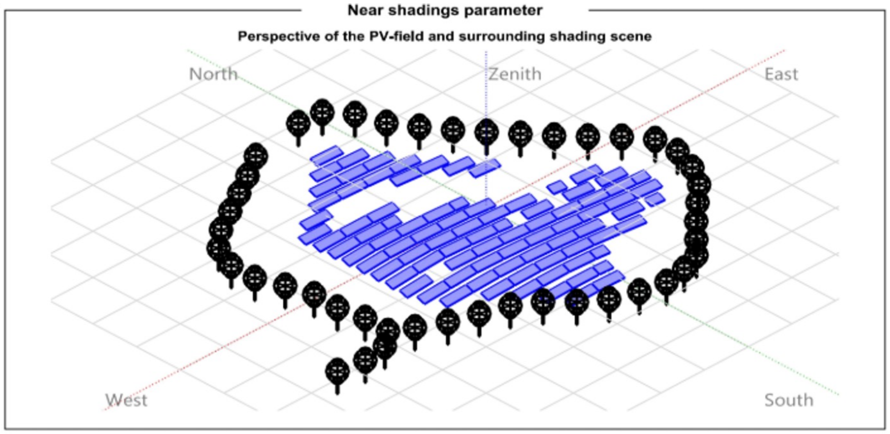
Scenario 1:

990 kWac Solar-Only

Pickett Landfill Solar PV project - 990 kWac / 1,271 kWdc



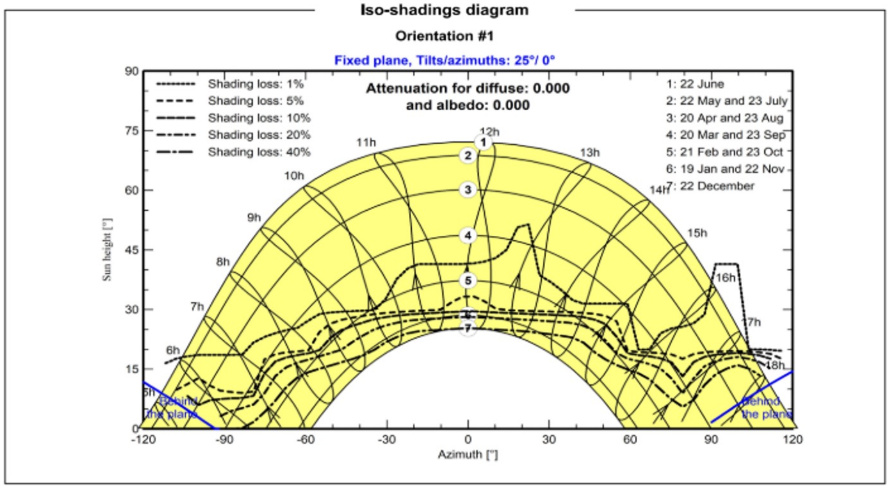


Table 1: System Summary

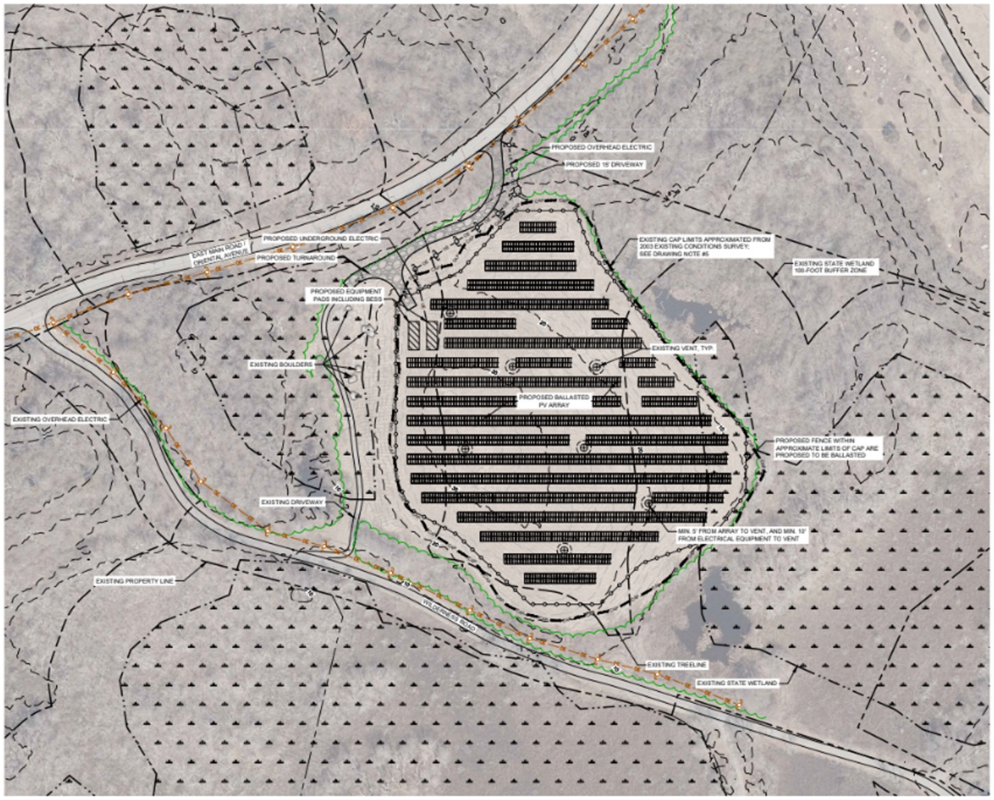
SYSTEM SUMMARY		
DESCRIPTION	**VALUE**	**UNITS**
MAXIMUM AC CAPACITY, NOMINAL	990	KW-AC
MAXIMUM DC CAPACITY	1,271	KW-DC
DC-AC RATIO	1.28	RATIO
ROW SPACING	13.5	FEET
GROUND COVER RATIO	0.50	RATIO
FIRST YEAR KWH OUTPUT	1,608,531	KWH-AC
AC CAPACITY FACTOR	0.185	RATIO
DC CAPACITY FACTOR	0.144	RATIO
INVERTER: SOLECTRIA XGI 1500-166/166		
INVERTER OUTPUT VOLTAGE	600	VOLTS
INVERTER OUTPUT POWER, NOMINAL[1]	166	KW-AC
TOTAL NUMBER OF INVERTERS	6	EACH
NUMBER OF STRINGS PER INVERTER	14-15	EACH
MODULE: VSUN575N-144BMH-DG 575W		
MODULE POWER RATING	575	WATTS-DC
TOTAL NUMBER OF MODULES	2,210	EACH
MODULES PER RACK, VERTICALLY	2	PORTRAIT
MODULES PER STRING	26	EACH
MAX DC SYSTEM VOLTAGE	1,500	VOLTS
NUMBER OF STRINGS	85	EACH
TILT ANGLE	25	DEGREES

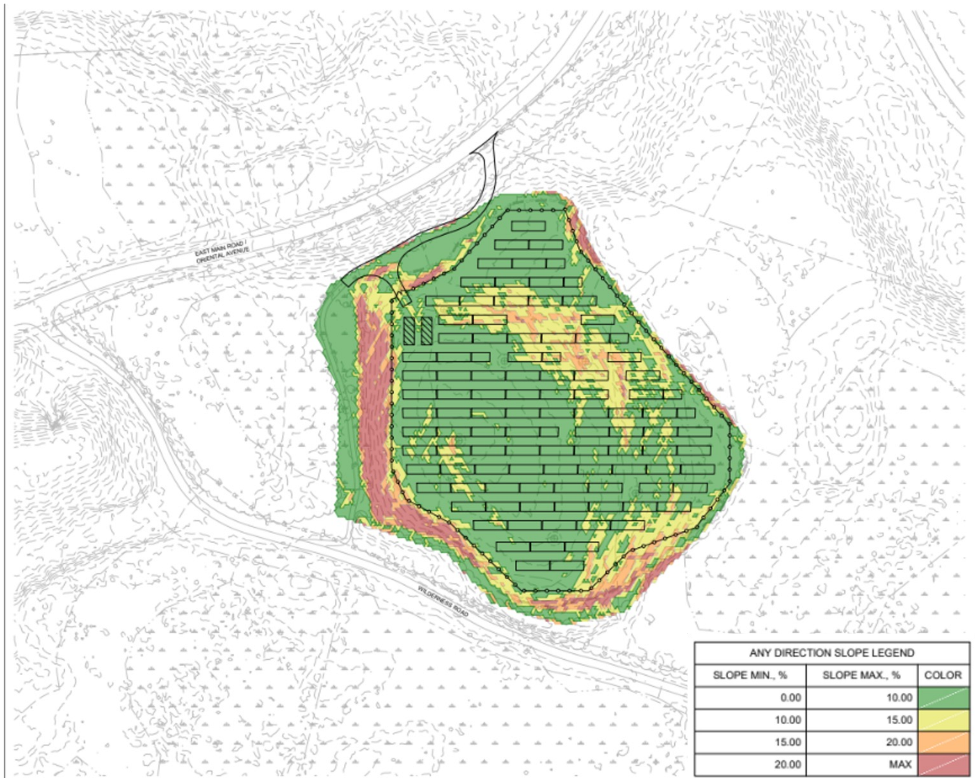
[1] INVERTERS TO BE DERATED BY MANUFACTURER TO A NOMINAL OUTPUT POWER OF 165KW-AC.

Fishers Island - Picket Landfill Solar Summary

Site	BLP Total Annual Load (kWh)	MLP Total Annual Load (kWh)	Solar System Size (kWac)	Total Annual Generation (kWh)	BLP Percentage of NZE	MLP Percentage of NZE
Pickett Power	7,719,316	9,649,459	990	1,607,068	21%	17%

Pickett Landfill Solar PV project site layout





ANY DIRECTION SLOPE LEGEND		
SLOPE MIN., %	SLOPE MAX., %	COLOR
0.00	10.00	
10.00	15.00	
15.00	20.00	
20.00	MAX	

EXISTING CONDITIONS ANY DIRECTION SLOPE MAP
SCALE: 1"=60'

Load profiles

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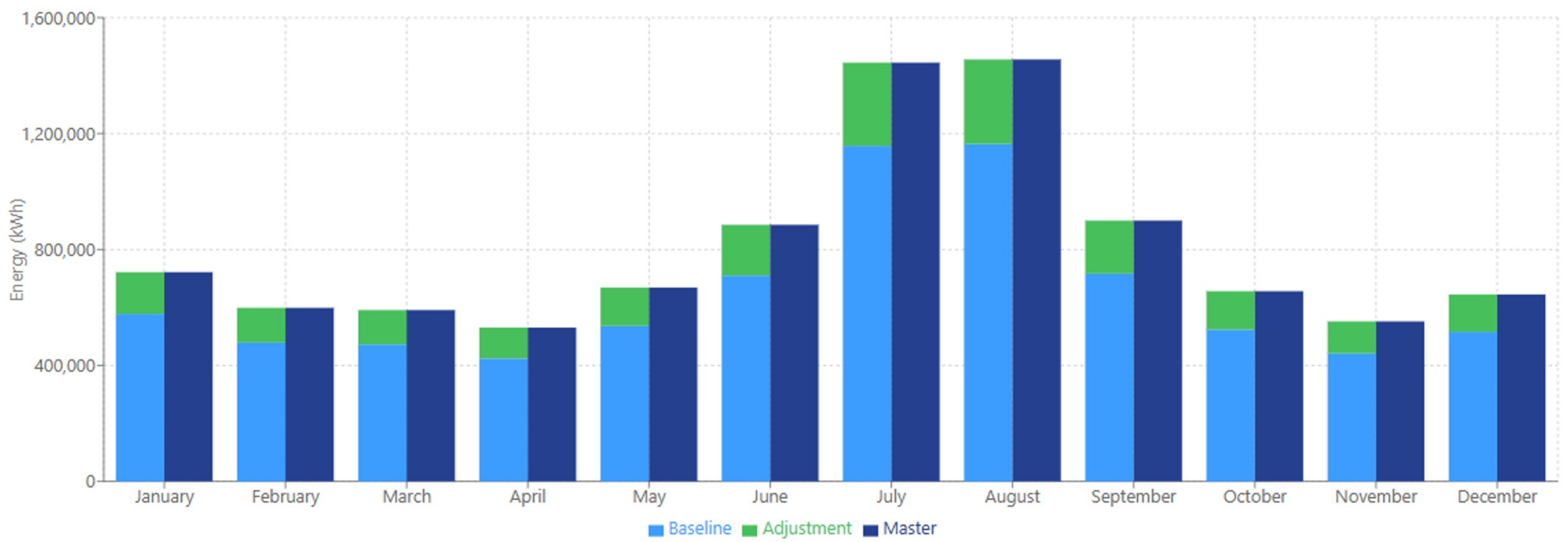
Monthly Energy Consumption and Solar



Total Monthly and Daily Max, Average, and Min Electricity Usage by Profile Type

Month	Baseline				Adjustment				Master			
	Max Daily [kWh]	Average Daily [kWh]	Min Daily [kWh]	Monthly Total [kWh]	Max Daily [kWh]	Average Daily [kWh]	Min Daily [kWh]	Monthly Total [kWh]	Max Daily [kWh]	Average Daily [kWh]	Min Daily [kWh]	Monthly Total [kWh]
January	23,431	18,629	13,245	577,508	5,858	4,657	3,311	144,377	29,289	23,287	16,556	721,885
February	20,756	17,109	13,253	479,041	5,189	4,277	3,313	119,760	25,945	21,386	16,566	598,801
March	19,702	15,244	12,664	472,560	4,926	3,820	3,166	118,418	24,550	19,064	15,838	590,978
April	15,922	14,149	12,833	424,469	3,981	3,539	3,208	106,174	19,555	17,688	16,193	530,643
May	22,179	17,300	13,842	536,290	5,545	4,274	3,461	132,487	27,690	21,573	17,358	668,777
June	30,635	23,673	19,613	710,201	7,480	5,833	4,903	174,992	37,724	29,506	24,713	885,193
July	45,240	37,336	32,072	1,157,425	11,310	9,269	7,659	287,337	56,358	46,605	40,200	1,444,762
August	46,699	37,547	31,529	1,163,972	11,675	9,411	7,882	291,727	58,043	46,958	39,494	1,455,699
September	32,730	23,886	19,111	716,566	8,944	6,104	4,778	183,134	41,642	29,990	24,019	899,700
October	20,616	16,897	14,039	523,795	5,154	4,269	3,510	132,328	25,626	21,165	17,642	656,123
November	18,269	14,719	12,704	441,566	4,567	3,680	3,176	110,402	22,506	18,399	16,018	551,968
December	24,310	16,643	13,737	515,923	6,078	4,162	3,442	129,007	28,208	20,804	17,179	644,929
Annual Total				**7,719,316**				**1,930,143**				**9,649,458**

BLP Peak Load: 2,425 kW
ALP Peak Load: 606 kW
MLP Peak Load: 3,031 kW

BLP and 990 kWac solar (Year 1)

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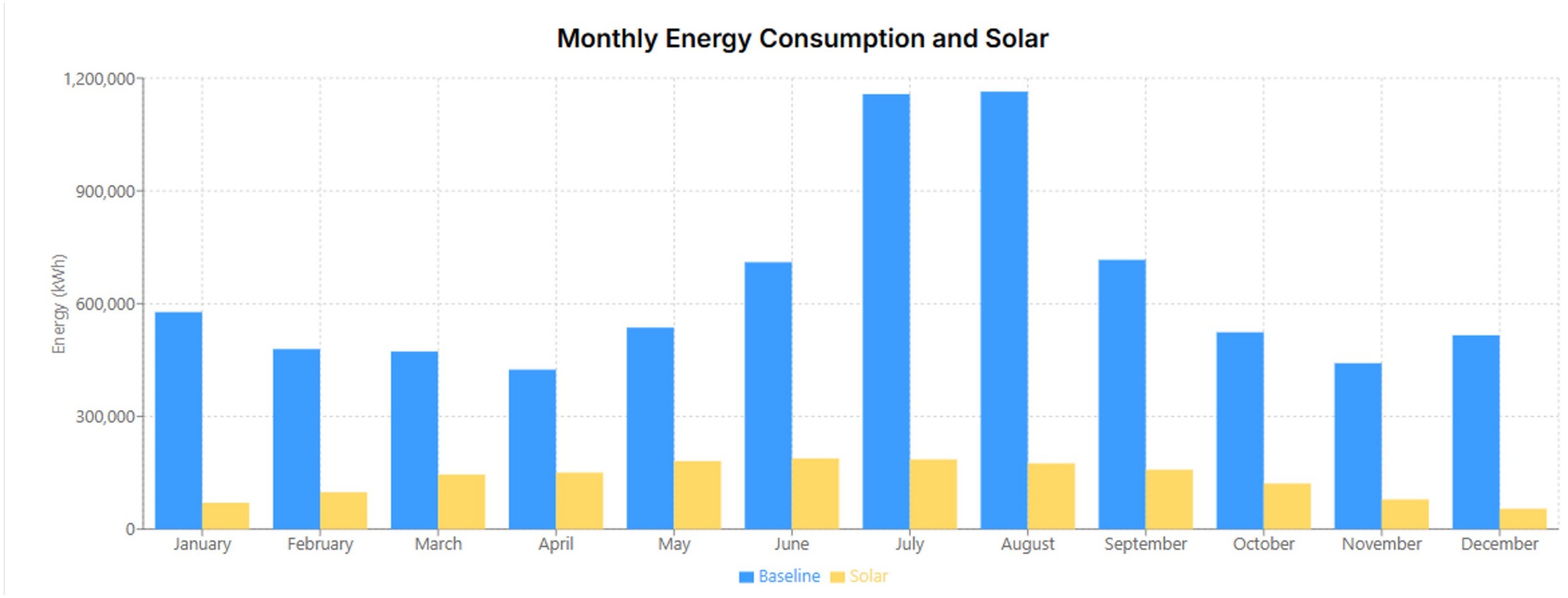

Total Critical Load Required (TCLR) Summary

Month	Baseline				Solar				TCLR (Max Daily Load – Average Daily Solar) (kWh)
	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	
January	23,431	18,629	13,245	577,508	4,246	2,268	456	70,293	21,163
February	20,756	17,109	13,253	479,041	6,045	3,505	-24	98,143	17,251
March	19,702	15,244	12,664	472,560	7,733	4,689	748	145,373	15,013
April	15,922	14,149	12,833	424,469	7,996	5,015	-21	150,446	10,907
May	22,179	17,300	13,842	536,290	8,384	5,843	1,680	181,129	16,336
June	30,635	23,673	19,613	710,201	8,537	6,271	2,664	188,142	24,364
July	45,240	37,336	32,072	1,157,425	8,362	5,985	822	185,530	39,255
August	46,699	37,547	31,529	1,163,972	8,090	5,646	2,317	175,018	41,053
September	32,730	23,886	19,111	716,566	7,808	5,266	1,560	157,972	27,464
October	20,616	16,897	14,039	523,795	7,100	3,923	238	121,606	16,693
November	18,269	14,719	12,704	441,566	5,398	2,638	180	79,136	15,631
December	24,310	16,643	13,737	515,923	2,815	1,751	141	54,280	22,559
Annual Total				**7,719,316**				**1,607,068**	**6,112,248**

41,053 kWh
Max Daily
TCLR
(Year 15)

MLP and 990 kWac solar (Year 15)

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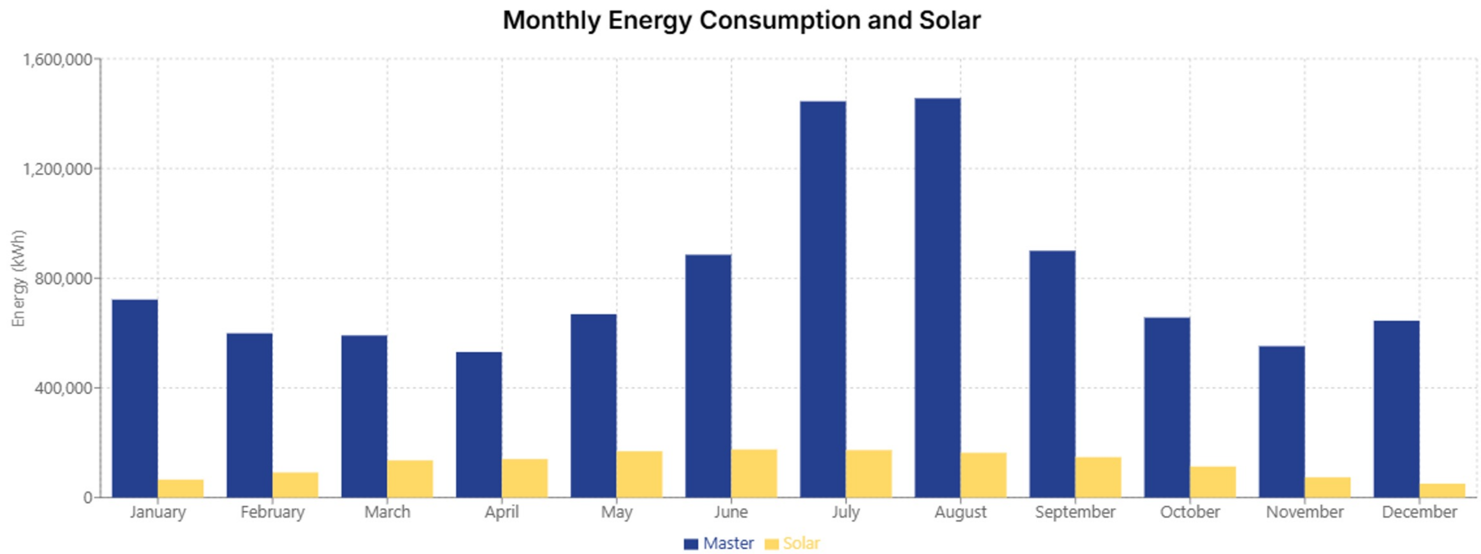

Total Critical Load Required (TCLR) Summary

Month	Master				Solar				TCLR (Max Daily Load – Average Daily Solar) (kWh)
	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	
January	29,289	23,287	16,556	721,885	3,959	2,114	425	65,529	27,175
February	25,945	21,386	16,566	598,801	5,635	3,268	-22	91,492	22,677
March	24,550	19,064	15,838	590,978	7,209	4,372	697	135,521	20,178
April	19,555	17,688	16,193	530,643	7,454	4,675	-20	140,250	14,880
May	27,690	21,573	17,358	668,777	7,816	5,447	1,566	168,854	22,243
June	37,724	29,506	24,713	885,193	7,959	5,846	2,484	175,392	31,878
July	56,358	46,605	40,200	1,444,762	7,795	5,579	766	172,956	50,779
August	58,043	46,958	39,494	1,455,699	7,542	5,263	2,160	163,157	52,780
September	41,642	29,990	24,019	899,700	7,279	4,909	1,454	147,266	36,733
October	25,626	21,165	17,642	656,123	6,619	3,657	222	113,364	21,969
November	22,506	18,399	16,018	551,968	5,032	2,459	168	73,773	20,047
December	28,208	20,804	17,179	644,929	2,624	1,632	131	50,602	26,576
Annual Total	—	—	—	**9,649,458**	—	—	—	**1,498,156**	**8,151,302**

52,780 kWh
Max Daily
TCLR
(Year 15)

Scenario 1: Diesel gen and solar resilience analysis

- **Generator Specs:**
  - Model: Cummins 2500DQLC
  - Rated Output: 2,490 kW
  - Fuel tank (sub-tank): 4,200 gallons
  - Fuel Type: Diesel
- **Step 1: Estimate Energy Content of Diesel**
  - 1 gallon of diesel contains ≈ 37.95 kWh of thermal energy.
  - Total thermal energy = 4,200 gal × 37.95 kWh/gal = 159,390 kWh (thermal)
- **Step 2: Estimate Generator Efficiency**
  - Most large diesel generators run at ~30% to 40% efficiency, converting thermal energy to electricity.
  - Let's assume a 35% efficiency (a realistic midpoint for a large generator like this):
    - Usable electrical energy = 159,390 × 0.35 = **55,787 kWh** (electric)
- **BLP Minimum resilience duration of Diesel generator and solar (Year 1)**
  - BLP Max 24-hour load is 46,699 kWh, occuring in August
  - Average 24-hour solar generation in August is 5,646 kWh
  - 55,787 kWh (diesel gen) + 5,646 kWh (solar) = 61,433 kWh
  - 61,433 (diesel gen + solar) / 46,699(Max 24-hour load) = 1.32 * 24 hours = **~32 hours**
  - **This is equal to ~32 hours of minimum resilience**
- **MLP Minimum resilience duration of Diesel generator and solar (Year 15)**
  - MLP Max 24-hour load is 58,043 kWh, occuring in August
  - Average 24-hour solar generation in August is 5,263 kWh
  - 61,050 (diesel gen + solar) / 58,043 (Max 24-hour load) = 1.05*24 hours = **~25 hours**
  - **This is equal to ~25 hours of minimum resilience**

BLP Energy Flow Diagram
990 kWac solar only (Year 1)

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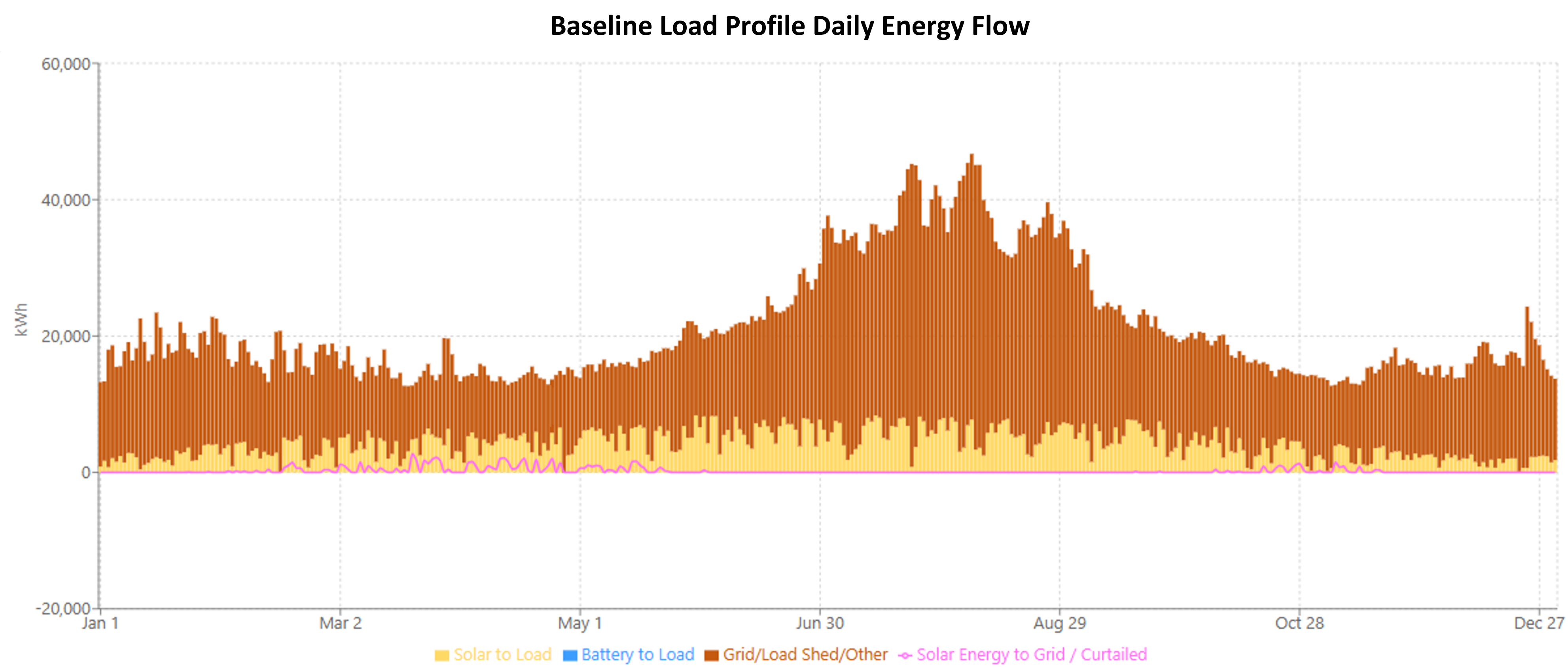

	Total Annual Load (kWh)	Annual Solar Generation (kWh)	Total Solar to Load (kWh)	Total Battery to Load (kWh)	Solar Energy to Grid/Curtailed (kWh)	Grid Import/Load Shed/Other (kWh)
Energy	7,719,316	1,607,067	1,529,091	0	77,976	6,190,224
Percentage of Load	100.0%	20.8%	19.8%	0.0%	1.0%	80.2%
Percentage of Solar	480.3%	100.0%	95.2%	0.0%	4.8%	385.2%

MLP Energy Flow Diagram
990 kWac solar only (Year 15)

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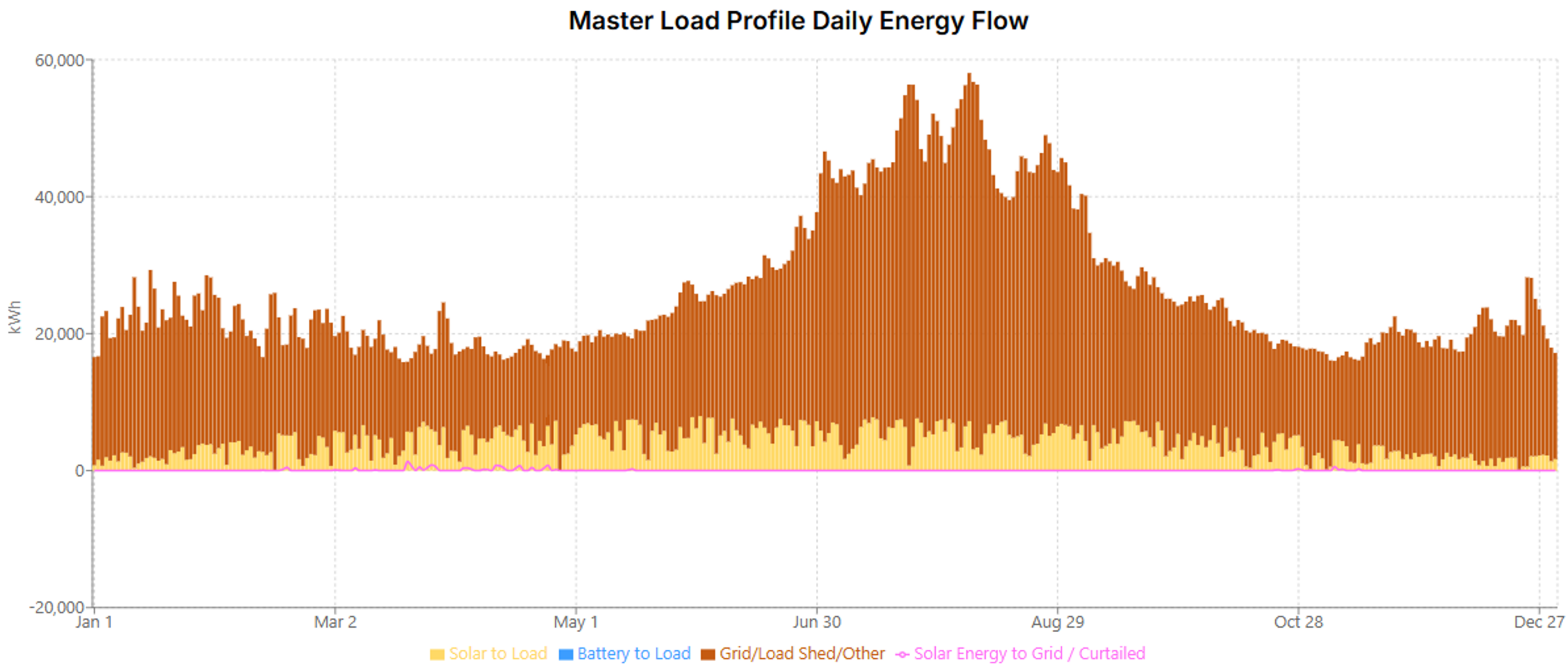

Master Profile Energy Flow Summary

	MLP Total Annual Load (kWh)	Annual Solar Generation (kWh)	Total Solar to Load (kWh)	Total Battery to Load (kWh)	Solar Energy to Grid/Curtailed (kWh)	Grid Import/Load Shed/Other (kWh)
Energy	9,649,459	1,498,157	1,484,199	0	13,958	8,165,260
Percentage of Load	100.0%	15.5%	15.4%	0.0%	0.1%	84.6%
Percentage of Solar	644.1%	100.0%	99.1%	0.0%	0.9%	545.0%

Scenario 1 - Solar only total net project cost

Fishers Island - 990 kWac Solar System Costs						
Site	Solar System Cost	Solar Cost Per W/dc	30% Investment Tax Credit (ITC)	Federal MACRS, Bonus Depreciation - 20% (2026 Place in Service)	State 10 year straight line Depreciation	Total Net Project Cost
Fishers Island	$ (2,834,330)	$ 2.23	$ 850,299	$ 722,754	$ 226,746	$ (1,034,531)

Solar equipment and installation costs were based on figures from the "Pickett Solar Financing Model," with a 10% adder applied to account for adverse tariff impacts.

Current electric bill vs bill after Solar only (Year 1)

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Fishers Island Solar Only System Savings Based on the BLP (Year 1)						
Site	Electric Bill Cost		Energy Cost		Demand Cost	
	Before / After	Savings	Before / After	Savings	Before / After	Savings
Fishers Island	$1,076,965 / $907,114	$169,850	$791,428 / $626,524	$164,903	$279,837 / $274,890	$4,947

Scenario 1 - Cash flow analysis

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Years	Project Costs	PV & Storage O&M / Equipment Replacement	Electric Bill Savings	PV Generation (kWh)	State Tax Effect	Federal Tax Effect	Total Cash Flow	Cumulative Cash Flow
Upfront	-$2,834,330	-	-	-	-	-	-$2,834,330	-$2,834,330
1	-	-$2,923	$169,850	1,608,501	$22,675	$1,110,490	$1,300,092	-$1,534,238
2	-	-$2,982	$174,071	1,600,459	$22,675	$185,025	$378,789	-$1,155,449
3	-	-$3,041	$178,392	1,592,416	$22,675	$111,015	$309,041	-$846,408
4	-	-$3,102	$182,816	1,584,374	$22,675	$66,609	$268,998	-$577,410
5	-	-$3,164	$187,345	1,576,331	$22,675	$66,609	$273,464	-$303,946
6	-	-$3,228	$191,981	1,568,289	$22,675	$33,305	$244,732	-$59,214
7	-	-$3,292	$196,726	1,560,246	$22,675	-	$216,109	$156,894
8	-	-$3,358	$201,583	1,552,204	$22,675	-	$220,900	$377,794
9	-	-$3,425	$206,555	1,544,161	$22,675	-	$225,805	$603,599
10	-	-$3,494	$211,644	1,536,119	$22,675	-	$230,825	$834,424
11	-	-$3,563	$216,852	1,528,076	-	-	$213,288	$1,047,712
12	-	-$3,635	$222,182	1,520,034	-	-	$218,547	$1,266,258
13	-	-$3,707	$227,636	1,511,991	-	-	$223,929	$1,490,187
14	-	-$3,782	$233,218	1,503,949	-	-	$229,436	$1,719,623
15	-	-$3,857	$238,930	1,495,906	-	-	$235,073	$1,954,696
16	-	-$448,784	$244,775	1,487,864	-	-	-$204,010	$1,750,687
17	-	-$4,013	$250,755	1,479,821	-	-	$246,742	$1,997,429
18	-	-$4,093	$256,874	1,471,779	-	-	$252,781	$2,250,210
19	-	-$4,175	$263,135	1,463,736	-	-	$258,959	$2,509,169
20	-	-$4,259	$269,540	1,455,694	-	-	$265,281	$2,774,450
21	-	-$4,344	$276,092	1,447,651	-	-	$271,748	$3,046,198
22	-	-$4,431	$282,795	1,439,609	-	-	$278,364	$3,324,562
23	-	-$4,519	$289,651	1,431,566	-	-	$285,132	$3,609,694
24	-	-$4,610	$296,665	1,423,523	-	-	$292,055	$3,901,749
25	-	-$4,702	$303,838	1,415,481	-	-	$299,136	$4,200,886
Totals:	**-$2,834,330**	**-$538,484**	**$5,773,900**	**37,799,776**	**$226,746**	**$1,573,053**	**$4,200,886**	**-**

Financial Metrics

Payback:	6.3 Years
ROI:	148.2%
10 Year IRR:	7.3%
20 Year IRR:	11.9%

Assumptions

Utility Escalator:	3.0%
Federal tax rate:	30.0%
State tax rate:	8.0%
Modeling:	Before Tax

- 5% Utility Cost Escalator
- Rate schedule: Large General Service (LGS) Sale-Resale (2025)
  - No Compensation for exported energy

Scenario 1 resilience & economics summary

Clean Coalition

Solar only sizing

- Solar: 990 kWac, 1,271 kWdc

Economic results:

- Cash Purchase ($2.23/Wdc solar):
  - Total project cost: ($2,834,330)
  - 30% ITC: $1,799,799
  - Federal & State Deprecation: $949,500
  - Total net project cost: ($1,034,531)
  - Total 25 Year O&M cost: ($538,484)
  - 25 Year electric bill savings: $5,773,900
  - **25 Year net cumulative savings: $4,200,886**

Minimum solar+BESS+diesel resilience:

- **BLP resilience duration:** 32 hours
- **MLP resilience duration**: 25 hours

Recommendations:

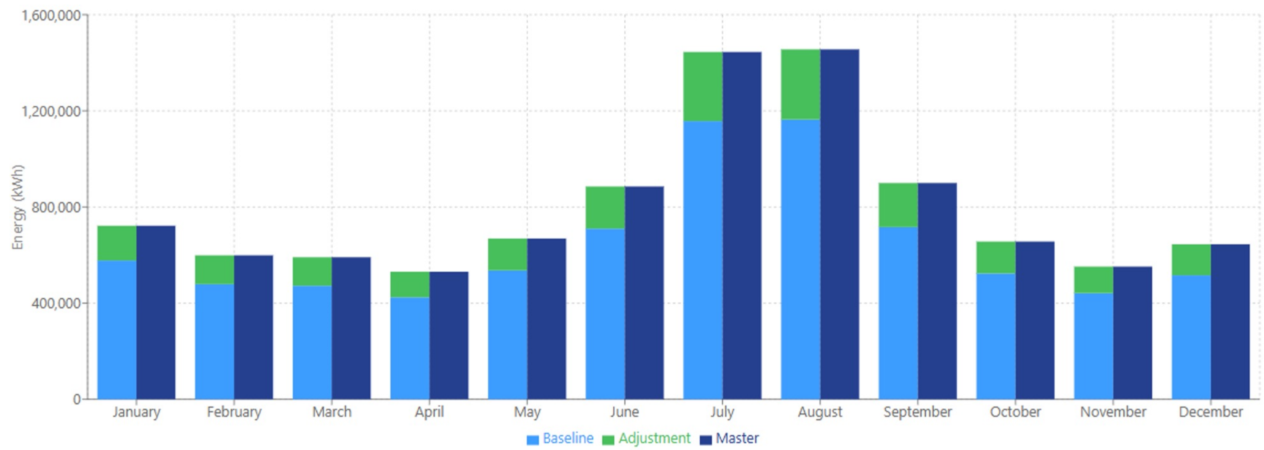
- Move on to Scenario 2: 990 kWac solar & 1,927.2 kW & 3,854 kWh BESS

Scenario 2 - 990 kWac solar + 1930 kW 2-hours BESS

Scenario 2:
990 kWac solar +
1,930 kW 2-hour BESS

Load profiles

Monthly Energy Consumption and Solar



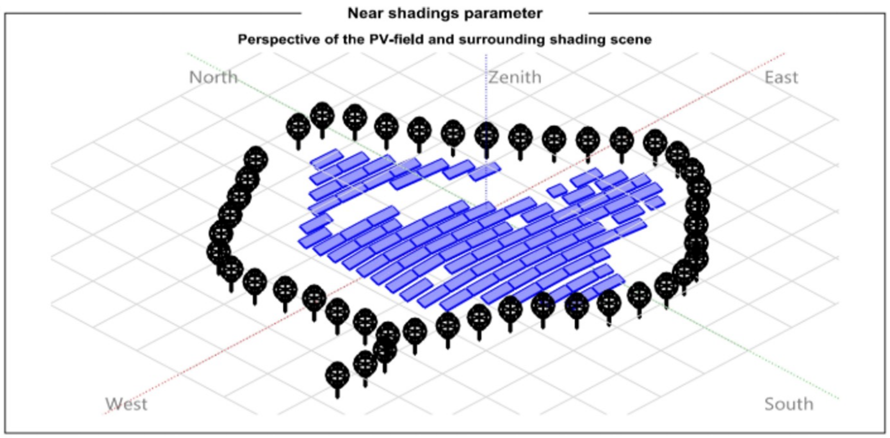
BLP Peak Load: 2,425 kW
ALP Peak Load: 606 kW
MLP Peak Load: 3,031 kW

Total Monthly and Daily Max, Average, and Min Electricity Usage by Profile Type

Month	Baseline				Adjustment				Master			
	Max Daily [kWh]	Average Daily [kWh]	Min Daily [kWh]	Monthly Total [kWh]	Max Daily [kWh]	Average Daily [kWh]	Min Daily [kWh]	Monthly Total [kWh]	Max Daily [kWh]	Average Daily [kWh]	Min Daily [kWh]	Monthly Total [kWh]
January	23,431	18,629	13,245	577,508	5,858	4,657	3,311	144,377	29,289	23,287	16,556	721,885
February	20,756	17,109	13,253	479,041	5,189	4,277	3,313	119,760	25,945	21,386	16,566	598,801
March	19,702	15,244	12,664	472,560	4,926	3,820	3,166	118,418	24,550	19,064	15,838	590,978
April	15,922	14,149	12,833	424,469	3,981	3,539	3,208	106,174	19,555	17,688	16,193	530,643
May	22,179	17,300	13,842	536,290	5,545	4,274	3,461	132,487	27,690	21,573	17,358	668,777
June	30,635	23,673	19,613	710,201	7,480	5,833	4,903	174,992	37,724	29,506	24,713	885,193
July	45,240	37,336	32,072	1,157,425	11,310	9,269	7,659	287,337	56,358	46,605	40,200	1,444,762
August	46,699	37,547	31,529	1,163,972	11,675	9,411	7,882	291,727	58,043	46,958	39,494	1,455,699
September	32,730	23,886	19,111	716,566	8,944	6,104	4,778	183,134	41,642	29,990	24,019	899,700
October	20,616	16,897	14,039	523,795	5,154	4,269	3,510	132,328	25,626	21,165	17,642	656,123
November	18,269	14,719	12,704	441,566	4,567	3,680	3,176	110,402	22,506	18,399	16,018	551,968
December	24,310	16,643	13,737	515,923	6,078	4,162	3,442	129,007	28,208	20,804	17,179	644,929
Annual Total	—	—	—	**7,719,316**	—	—	—	**1,930,143**	—	—	—	**9,649,458**

Pickett Landfill Solar PV project - 990 kWac, 1,271 kWdc

Clean Coalition



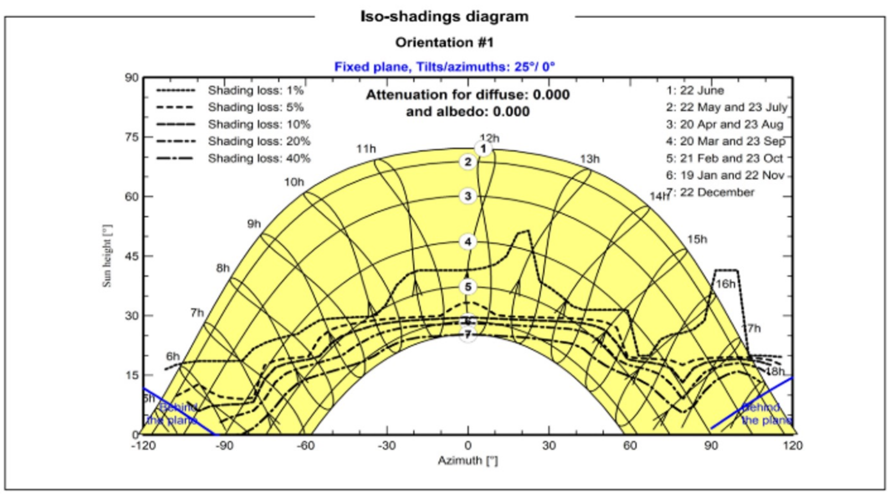


Table 1: System Summary

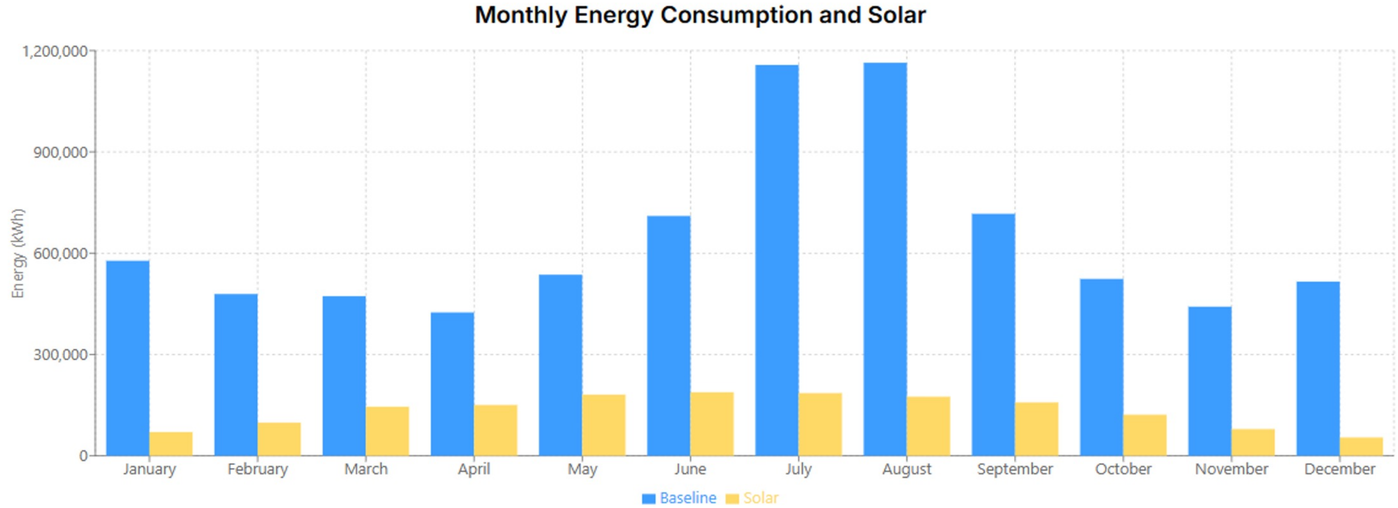
SYSTEM SUMMARY		
DESCRIPTION	**VALUE**	**UNITS**
MAXIMUM AC CAPACITY, NOMINAL	990	KW-AC
MAXIMUM DC CAPACITY	1,271	KW-DC
DC-AC RATIO	1.28	RATIO
ROW SPACING	13.5	FEET
GROUND COVER RATIO	0.50	RATIO
FIRST YEAR KWH OUTPUT	1,608,531	KWH-AC
AC CAPACITY FACTOR	0.185	RATIO
DC CAPACITY FACTOR	0.144	RATIO
INVERTER: SOLECTRIA XGI 1500-166/166		
INVERTER OUTPUT VOLTAGE	600	VOLTS
INVERTER OUTPUT POWER, NOMINAL[1]	166	KW-AC
TOTAL NUMBER OF INVERTERS	6	EACH
NUMBER OF STRINGS PER INVERTER	14-15	EACH
MODULE: VSUN575N-144BMH-DG 575W		
MODULE POWER RATING	575	WATTS-DC
TOTAL NUMBER OF MODULES	2,210	EACH
MODULES PER RACK, VERTICALLY	2	PORTRAIT
MODULES PER STRING	26	EACH
MAX DC SYSTEM VOLTAGE	1,500	VOLTS
NUMBER OF STRINGS	85	EACH
TILT ANGLE	25	DEGREES

[1] INVERTERS TO BE DERATED BY MANUFACTURER TO A NOMINAL OUTPUT POWER OF 165KW-AC.

Fishers Island - Picket Landfill Solar Summary						
Site	BLP Total Annual Load (kWh)	MLP Total Annual Load (kWh)	Solar System Size (kWac)	Total Annual Generation (kWh)	BLP Percentage of NZE	MLP Percentage of NZE
Pickett Power	7,719,316	9,649,459	990	1,607,068	21%	17%

BLP and 990 kWac solar (Year 1)

Clean Coalition

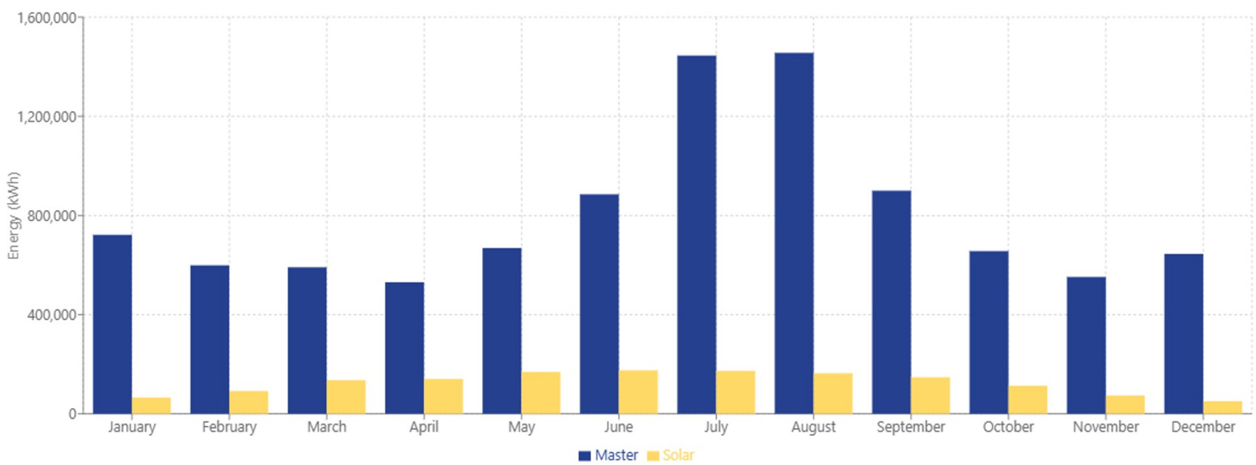


Month	Baseline				Solar				TCLR (Max Daily Load – Average Daily Solar) (kWh)
	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	
January	23,431	18,629	13,245	577,508	4,246	2,268	456	70,293	21,163
February	20,756	17,109	13,253	479,041	6,045	3,505	-24	98,143	17,251
March	19,702	15,244	12,664	472,560	7,733	4,689	748	145,373	15,013
April	15,922	14,149	12,833	424,469	7,996	5,015	-21	150,446	10,907
May	22,179	17,300	13,842	536,290	8,384	5,843	1,680	181,129	16,336
June	30,635	23,673	19,613	710,201	8,537	6,271	2,664	188,142	24,364
July	45,240	37,336	32,072	1,157,425	8,362	5,985	822	185,530	39,255
August	46,699	37,547	31,529	1,163,972	8,090	5,646	2,317	175,018	41,053
September	32,730	23,886	19,111	716,566	7,808	5,266	1,560	157,972	27,464
October	20,616	16,897	14,039	523,795	7,100	3,923	238	121,606	16,693
November	18,269	14,719	12,704	441,566	5,398	2,638	180	79,136	15,631
December	24,310	16,643	13,737	515,923	2,815	1,751	141	54,280	22,559
Annual Total				7,719,316				1,607,068	6,112,248

41,053 kWh
Max Daily TCLR
(Year 15)

MLP and 990 kWac solar (Year 15)

Clean Coalition



Total Critical Load Required (TCLR) Summary

Month	Master				Solar				TCLR (Max Daily Load – Average Daily Solar) (kWh)
	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	
January	29,289	23,287	16,556	721,885	3,959	2,114	425	65,529	27,175
February	25,945	21,386	16,566	598,801	5,635	3,268	-22	91,492	22,677
March	24,550	19,064	15,838	590,978	7,209	4,372	697	135,521	20,178
April	19,555	17,688	16,193	530,643	7,454	4,675	-20	140,250	14,880
May	27,690	21,573	17,358	668,777	7,816	5,447	1,566	168,854	22,243
June	37,724	29,506	24,713	885,193	7,959	5,846	2,484	175,392	31,878
July	56,358	46,605	40,200	1,444,762	7,795	5,579	766	172,956	50,779
August	58,043	46,958	39,494	1,455,699	7,542	5,263	2,160	163,157	52,780
September	41,642	29,990	24,019	899,700	7,279	4,909	1,454	147,266	36,733
October	25,626	21,165	17,642	656,123	6,619	3,657	222	113,364	21,969
November	22,506	18,399	16,018	551,968	5,032	2,459	168	73,773	20,047
December	28,208	20,804	17,179	644,929	2,624	1,632	131	50,602	26,576
Annual Total	—	—	—	**9,649,458**	—	—	—	**1,498,156**	**8,151,302**

52,780 kWh Max Daily TCLR (Year 15)

Scenario 2: BESS details

Clean Coalition

One 1,927 kW / 3,854 kWh Tesla Megapack II XL was used in Scenario 2

Energy Storage

Tesla Commercial, with Acumen EMS™

Get Acumen Quote

3.85MWh Energy Capacity	$876 Cost per kWh	$15.1 Savings per kWh

System Details

Cost:	$3,378,058
Duration:	2 hr
Charge Power	1,927 kW
Discharge Power:	1,927 kW
Depth of Discharge:	100%
RT Efficiency:	91.97%
Degradation:	0.03
Qty / Model:	(1) Tesl...
End of Life:	Replace
Annual Cycles:	38.67
Annual Energy Discharge:	142,927 kWh
Annual Energy Losses:	8,463 kWh
Exports Offset:	8%

ETB Controller Settings

Required License:
ETB Controller with Acumen AI
Strategy:
Demand Charge Management (DCM)
Export to Grid:
False
Charge From PV:
True

Costs and Incentives

Total ESS Cost:	$3,378,058
Federal MACRS, Bonus Depreciation - 20% (2026 Place in Service) (ESS):	($861,405)
Investment Tax Credit (ITC) - 30% (with Adders) (ESS):	($1,013,417)
State - 10 year straight line Depreciation (ESS):	($270,245)
Net ESS Cost:	$1,232,991

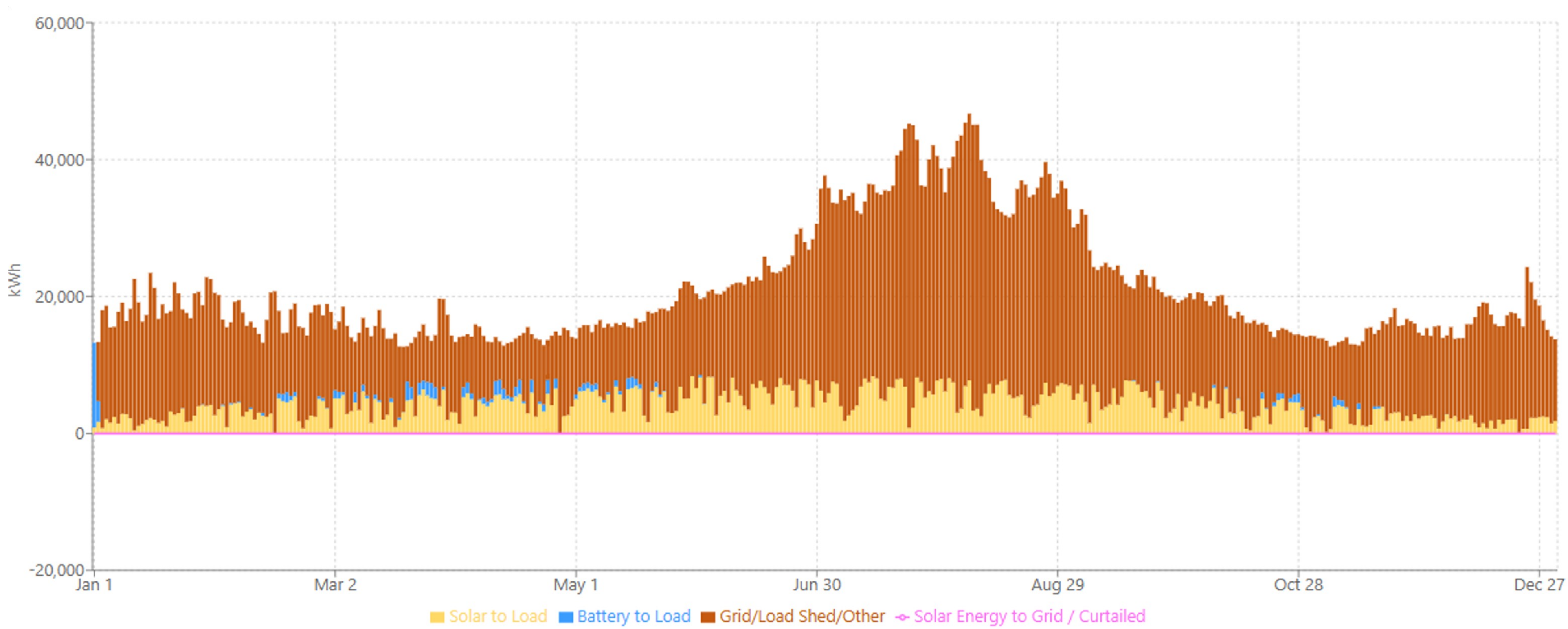
A 1,927 kW / 3,894 kWh BESS could not support the BLP (2,425 kW) or MLP (3,031 kW) peak load on its own because they exceed the BESS power capacity.

Scenario 2: Diesel generator and solar resilience analysis

Clean Coalition

- **Generator Specs:**
  - Model: Cummins 2500DQLC
  - Rated Output: 2,490 kW
  - Fuel tank (sub-tank): 4,200 gallons
  - Fuel Type: Diesel
- **Step 1: Estimate Energy Content of Diesel**
  - 1 gallon of diesel contains ≈ 37.95 kWh of thermal energy.
  - Total thermal energy = 4,200 gal × 37.95 kWh/gal = 159,390 kWh (thermal)
- **Step 2: Estimate Generator Efficiency**
  - Most large diesel generators run at ~30% to 40% efficiency, converting thermal energy to electricity.
  - Let's assume a 35% efficiency (a realistic midpoint for a large generator like this):
    - Usable electrical energy = 159,390 × 0.35 = **55,787 kWh** (electric)
- **BLP Minimum resilience duration of Diesel generator and solar (Year 1)**
  - BLP Max 24-hour is 46,699 kWh, occuring in August
  - Average 24-hour solar in August is 5,646 kWh
  - BESS energy capacity is 3,854 kWh
  - 55,787 kWh (diesel gen) + 5,646 kWh (solar) + 3,854 kWh (BESS) = 65,287 kWh
  - 65,282 (diesel gen + solar + BESS) / 46,699 (Max 24-hour load) = 1.40 * 24 hours = **~34 hours**
  - **This is equal to ~34 hours of minimum resilience**
- **MLP Minimum resilience duration of Diesel generator and solar (Year 15)**
  - MLP Max 24-hour is 58,043 kWh, occuring in August
  - Average 24-hour solar in August is 5,263 kWh
  - BESS energy capacity is 2,905 kWh
  - 66,211 kWh (diesel gen + solar + BESS) / 58,043 (Max 24-hour load) = 1.1*24 hours = **~27 hours**
  - **This is equal to ~27 hours of minimum resilience**

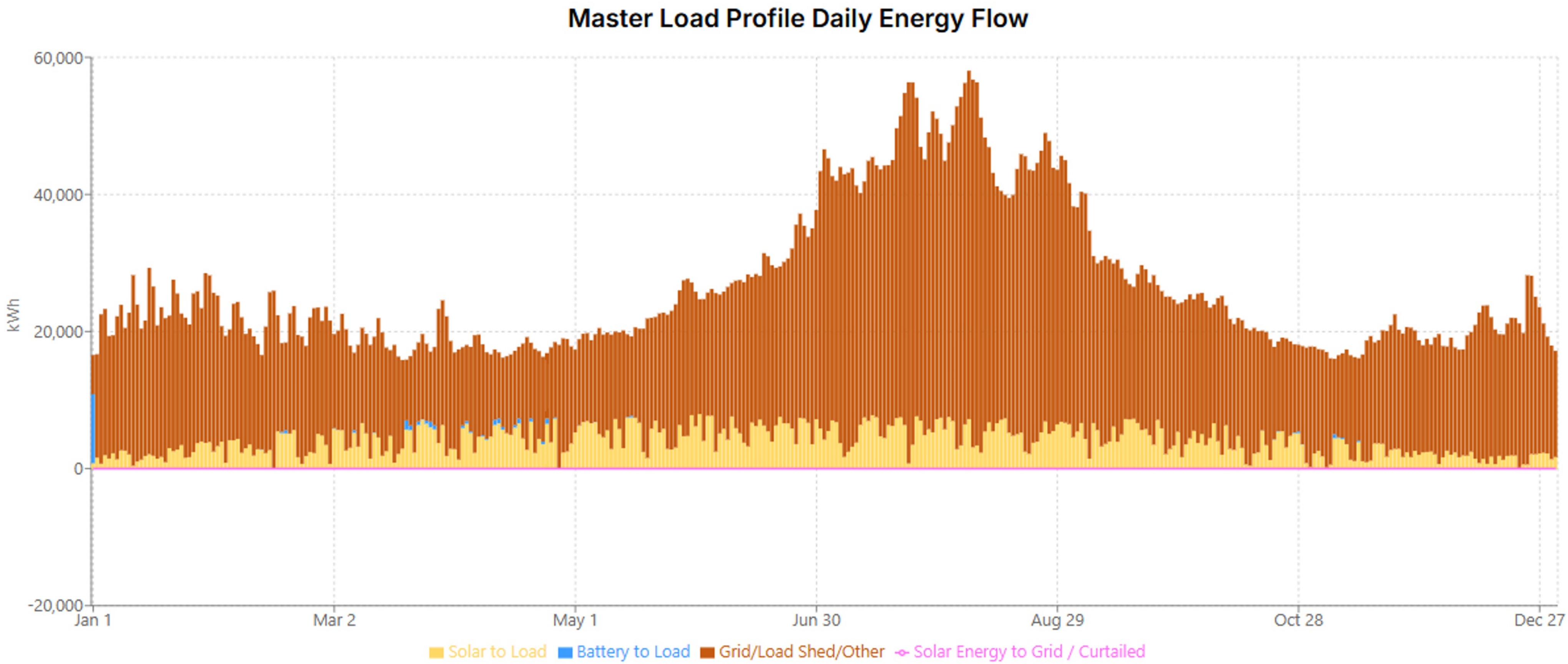
BLP Energy Flow Diagram
990 kWac & 1,927 kW / 3,854 kWh (Year 1)



	Total Annual Load (kWh)	Annual Solar Generation (kWh)	Total Solar to Load (kWh)	Total Battery to Load (kWh)	Solar Energy to Grid/Curtailed (kWh)	Grid Import/Load Shed/Other (kWh)
Energy	7,719,316	1,607,067	1,529,091	93,394	0	6,096,830
Percentage of Load	100.0%	20.8%	19.8%	1.2%	0.0%	79.0%
Percentage of Solar	480.3%	100.0%	95.2%	5.8%	0.0%	379.4%

MLP Energy Flow Diagram
990 kWac & 1,927 kW / 2,905 kWh (Year 15)

Clean Coalition



Master Profile Energy Flow Summary

	MLP Total Annual Load (kWh)	Annual Solar Generation (kWh)	Total Solar to Load (kWh)	Total Battery to Load (kWh)	Solar Energy to Grid/Curtailed (kWh)	Grid Import/Load Shed/Other (kWh)
Energy	9,649,459	1,498,157	1,484,199	24,024	0	8,141,237
Percentage of Load	100.0%	15.5%	15.4%	0.3%	0.0%	84.4%
Percentage of Solar	644.1%	100.0%	99.1%	1.6%	0.0%	543.4%

Total project costs

Fishers Island - Solar and BESS System Costs										
Site	Solar System Cost	Solar Cost Per W/dc	BESS Cost	Microgrid Capabilities Cost	BESS & Microgrid Capabilities Cost per kWh	Total Project Cost	30% Investment Tax Credit (ITC)	Federal MACRS, Bonus Depreciation - 20% (2026 Place in Service)	State 10 year straight line Depreciation	Total Net Project Cost
Fishers Island	$ (2,834,330)	$ 2.23	$ (2,328,058)	$ (1,050,000)	$ 876	$ (6,212,388)	$ 1,863,716	$ 1,584,159	$ 496,991	$ (2,267,522)

<u>Per guidance from Tim Hade, the following cost assumptions were used for economic modeling</u>:

- Solar equipment and installation costs were based on figures from the "Pickett Solar Financing Model," with a 10% adder applied to account for tariff impacts.
- Tesla Megapack II XL (1,927 kW / 3,854 kWh) pricing, also adjusted for tariffs, was set at $1,455,000 for the equipment. Delivery and installation costs were estimated to range from $750,000 to $1,000,000; a midpoint value of $875,000 was used for modeling purposes.
- The microgrid costs are difficult to estimate without first completing the Detailed Engineering Study. That said, we are assuming the $1,050,000 for microgrid costs for this initial feasibility study:
    - 1) 13.2kV switchgear & protection = $450,000
    - 2) Microgrid Controls, SCADA, and Communications = $400,000
    - 3) M&V, Commissioning = $200,000
- The Microgrid costs range is probably $700,000 - $1,300,000 and we won't know exactly until we get more information.

Current electric bill vs bill after Solar and BESS (Year 1)

Fishers Island Scenario 2 Solar & BESS System Savings Based on the BLP (Year 1)						
Site	Electric Bill Cost		Energy Cost		Demand Cost	
	Before / After	Savings	Before / After	Savings	Before / After	Savings
Fishers Island	$1,076,965 / $849,094	$227,871	$791,428 / $627,392	$164,036	$279,837 / $216,002	$63,835

Scenario 2 - Cash flow analysis

Clean Coalition

Years	Project Costs	PV & Storage O&M / Equipment Replacement	Electric Bill Savings	PV Generation (kWh)	State Tax Effect	Federal Tax Effect	Total Cash Flow	Cumulative Cash Flow
Upfront	-$6,212,388	-	-	-	-	-	-$6,212,388	-$6,212,388
1	-	-$2,923	$227,871	1,608,501	$49,699	$2,434,014	$2,708,660	-$3,503,728
2	-	-$2,982	$236,545	1,600,459	$49,699	$405,545	$688,807	-$2,814,921
3	-	-$3,041	$245,517	1,592,416	$49,699	$243,327	$535,501	-$2,279,419
4	-	-$3,102	$254,795	1,584,374	$49,699	$145,996	$447,388	-$1,832,032
5	-	-$3,164	$264,386	1,576,331	$49,699	$145,996	$456,917	-$1,375,114
6	-	-$3,228	$274,300	1,568,289	$49,699	$72,998	$393,770	-$981,345
7	-	-$3,292	$284,545	1,560,246	$49,699	-	$330,952	-$650,393
8	-	-$3,358	$295,128	1,552,204	$49,699	-	$341,469	-$308,924
9	-	-$3,425	$306,058	1,544,161	$49,699	-	$352,332	$43,408
10	-	-$3,494	$317,343	1,536,119	$49,699	-	$363,548	$406,956
11	-	-$3,563	$328,991	1,528,076	-	-	$325,428	$732,384
12	-	-$3,635	$341,011	1,520,034	-	-	$337,377	$1,069,760
13	-	-$3,707	$353,411	1,511,991	-	-	$349,703	$1,419,464
14	-	-$3,782	$366,198	1,503,949	-	-	$362,416	$1,781,880
15	-	-$3,857	$379,380	1,495,906	-	-	$375,523	$2,157,403
16	-	-$1,397,445	$447,244	1,487,864	-	-	-$950,201	$1,207,202
17	-	-$4,013	$463,953	1,479,821	-	-	$459,940	$1,667,141
18	-	-$4,093	$481,214	1,471,779	-	-	$477,121	$2,144,263
19	-	-$4,175	$499,042	1,463,736	-	-	$494,867	$2,639,130
20	-	-$4,259	$517,450	1,455,694	-	-	$513,191	$3,152,321
21	-	-$4,344	$536,451	1,447,651	-	-	$532,107	$3,684,428
22	-	-$4,431	$556,058	1,439,609	-	-	$551,627	$4,236,056
23	-	-$4,519	$576,285	1,431,566	-	-	$571,766	$4,807,821
24	-	-$4,610	$597,144	1,423,523	-	-	$592,535	$5,400,356
25	-	-$4,702	$618,649	1,415,481	-	-	$613,947	$6,014,303
Totals:	**-$6,212,388**	**-$1,487,145**	**$9,768,970**	**37,799,776**	**$496,991**	**$3,447,875**	**$6,014,303**	**-**

Financial Metrics

Payback:	8.9 Years
ROI:	96.8%
10 Year IRR:	1.8%
20 Year IRR:	7.1%

Assumptions

Utility Escalator:	5.0%
Federal tax rate:	30.0%
State tax rate:	8.0%
Modeling:	Before Tax

- 5% Utility Cost Escalator
- Rate schedule: Large General Service (LGS) Sale-Resale (2025)
  - No Compensation for exported energy

Scenario 2 - resilience & economics summary

Solar Microgrid sizing

- Solar: 990 kWac, 1,271 kWdc
- BESS: 1,927 kW / 3,854 kWh

Economic results:

- Cash Purchase ($2.23/Wdc solar, $876/kWh BESS w/ microgrid capabilities) :
  - Total project cost: ($6,212,388)
  - 30% ITC: $1,863,716
  - Federal MACRS & Straight Line Depreciation: $2,081,150
  - Total net project cost: ($2,267,522)
  - Total 25 Year O&M cost: ($1,487,145)
  - 25 Year electric bill savings: $9,768,970
  - **25 Year net cumulative savings: $6,014,303**

Minimum solar+BESS+diesel resilience:

- **BLP resilience duration:** 34 hours
- **MLP resilience duration:** 27 hours
- **BLP percentage of indefinite resilience:** 10%
- **MLP percentage of indefinite resilience**: 5%

Recommendations:

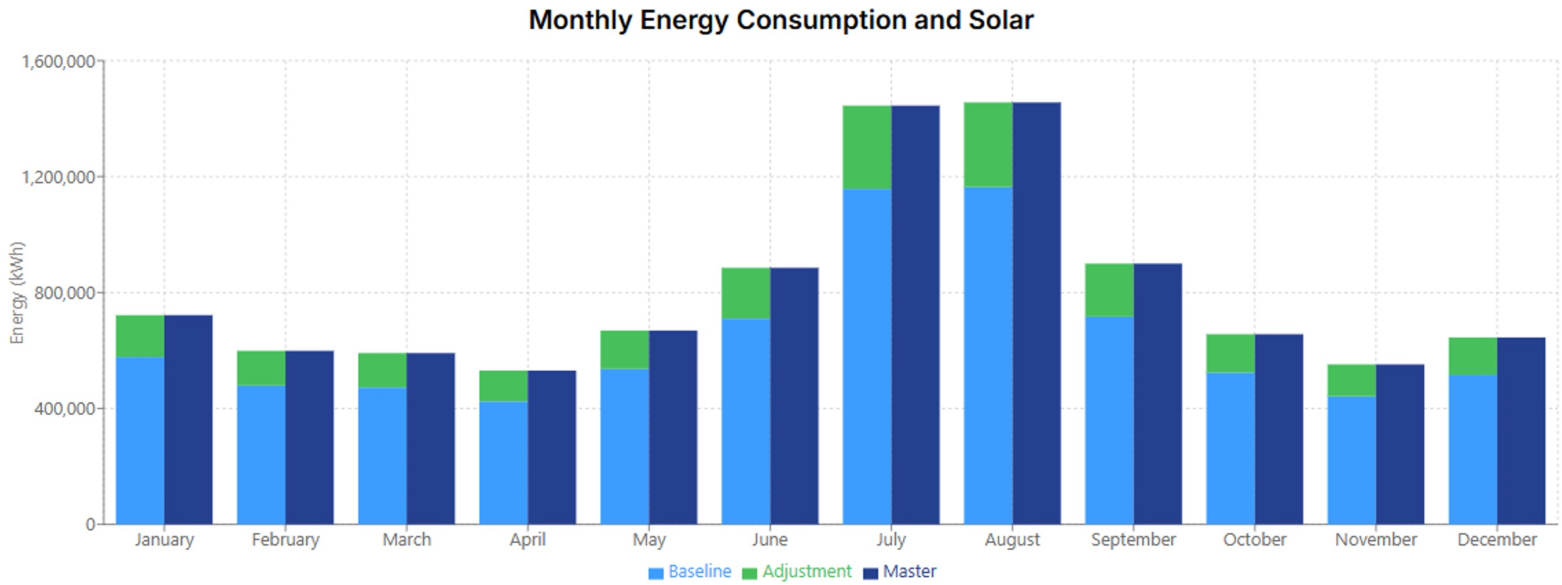
- Move on to Scenario 3: 4,950 kWac solar & 9,636 kW & 19,272 kWh BESS

Scenario 3 - 4,950 kWac solar & 9,636 kW & 19,272 kWh BESS

Clean Coalition

Scenario 3:
4,950 kWac solar +
9,630 kW 2-hour BESS

Load profiles



Total Monthly and Daily Max, Average, and Min Electricity Usage by Profile Type

Month	Baseline				Adjustment				Master			
	Max Daily [kWh]	Average Daily [kWh]	Min Daily [kWh]	Monthly Total [kWh]	Max Daily [kWh]	Average Daily [kWh]	Min Daily [kWh]	Monthly Total [kWh]	Max Daily [kWh]	Average Daily [kWh]	Min Daily [kWh]	Monthly Total [kWh]
January	23,431	18,629	13,245	577,508	5,858	4,657	3,311	144,377	29,289	23,287	16,556	721,885
February	20,756	17,109	13,253	479,041	5,189	4,277	3,313	119,760	25,945	21,386	16,566	598,801
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May	22,179	17,300	13,842	536,290	5,545	4,274	3,461	132,487	27,690	21,573	17,358	668,777
June	30,635	23,673	19,613	710,201	7,480	5,833	4,903	174,992	37,724	29,506	24,713	885,193
July	45,240	37,336	32,072	1,157,425	11,310	9,269	7,659	287,337	56,358	46,605	40,200	1,444,762
August	46,699	37,547	31,529	1,163,972	11,675	9,411	7,882	291,727	58,043	46,958	39,494	1,455,699
September	32,730	23,886	19,111	716,566	8,944	6,104	4,778	183,134	41,642	29,990	24,019	899,700
October	20,616	16,897	14,039	523,795	5,154	4,269	3,510	132,328	25,626	21,165	17,642	656,123
November	18,269	14,719	12,704	441,566	4,567	3,680	3,176	110,402	22,506	18,399	16,018	551,968
December	24,310	16,643	13,737	515,923	6,078	4,162	3,442	129,007	28,208	20,804	17,179	644,929
Annual Total	—	—	—	**7,719,316**	—	—	—	**1,930,143**	—	—	—	**9,649,458**

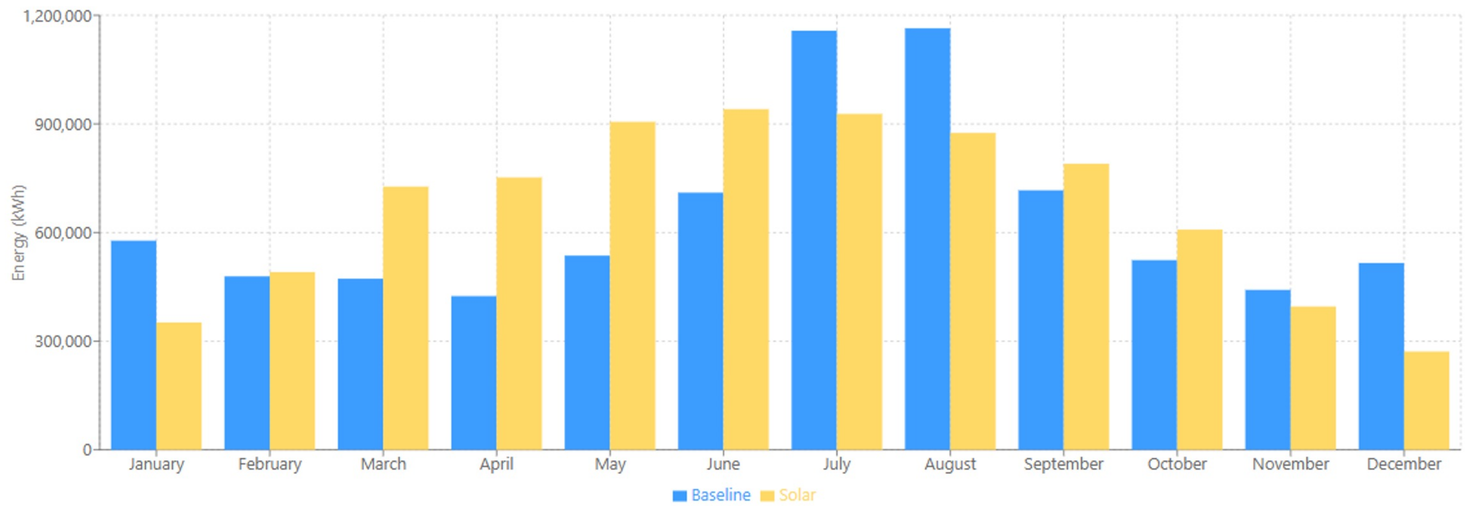
BLP Peak Load: 2,425 kW
ALP Peak Load: 606 kW
MLP Peak Load: 3,031 kW

Scenario 3 - 6,355 kWdc, 4,950 kWac

Fishers Island - Scenario 3 Solar Sizing						
Site	BLP Total Annual Load (kWh)	MLP Total Annual Load (kWh)	Solar System Size (kWac)	Total Annual Generation (kWh)	BLP Percentage of NZE	MLP Percentage of NZE
Scenario 3	7,719,316	9,649,459	4,950	8,035,340	104%	83%

BLP and 4,980 kWac solar (Year 1)

Monthly Energy Consumption and Solar



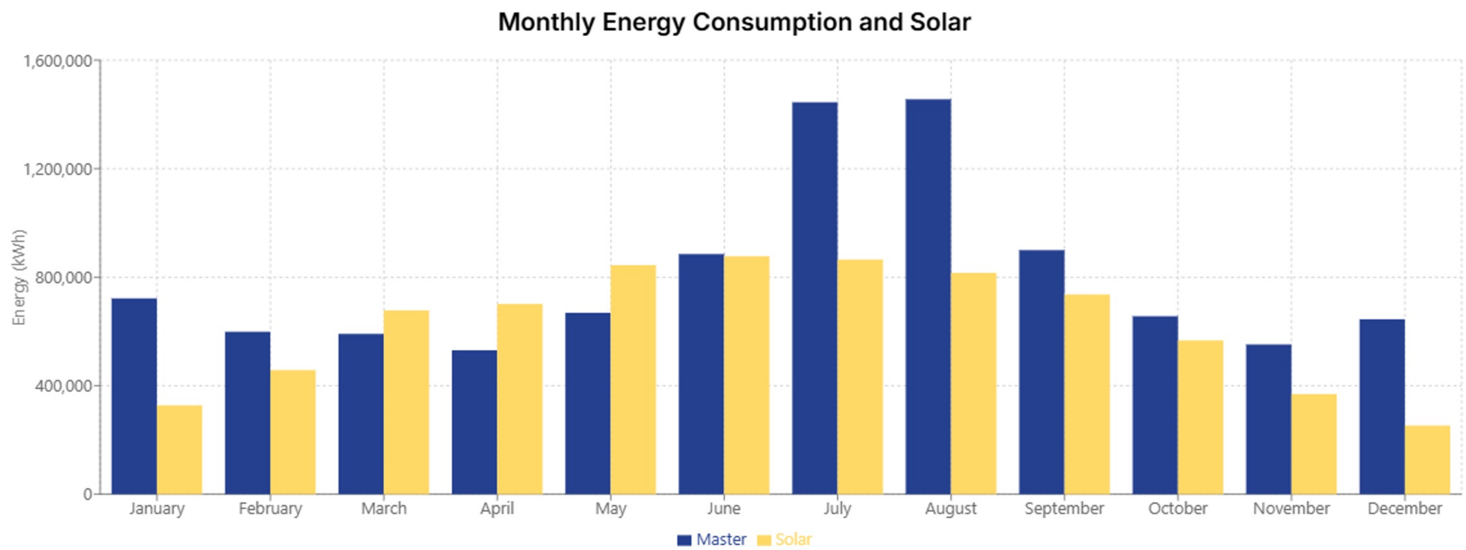
Total Critical Load Required (TCLR) Summary

Month	Baseline				Solar				TCLR (Max Daily Load – Average Daily Solar) (kWh)
	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	
January	23,431	18,629	13,245	577,508	21,232	11,338	2,282	351,466	12,093
February	20,756	17,109	13,253	479,041	30,223	17,526	-120	490,716	3,230
March	19,702	15,244	12,664	472,560	38,664	23,447	3,740	726,864	-3,745
April	15,922	14,149	12,833	424,469	39,978	25,074	-105	752,230	-9,152
May	22,179	17,300	13,842	536,290	41,919	29,214	8,400	905,645	-7,035
June	30,635	23,673	19,613	710,201	42,686	31,357	13,322	940,710	-722
July	45,240	37,336	32,072	1,157,425	41,810	29,924	4,109	927,648	15,316
August	46,699	37,547	31,529	1,163,972	40,452	28,229	11,587	875,090	18,470
September	32,730	23,886	19,111	716,566	39,042	26,329	7,798	789,859	6,401
October	20,616	16,897	14,039	523,795	35,502	19,614	1,192	608,028	1,002
November	18,269	14,719	12,704	441,566	26,992	13,189	900	395,682	5,080
December	24,310	16,643	13,737	515,923	14,076	8,755	704	271,398	15,555
Annual Total				**7,719,316**				**8,035,336**	**-316,020**

18,470 kWh Max Daily TCLR (Year 1)

MLP and 4,980 kWac solar (Year 15)

Clean Coalition



Total Critical Load Required (TCLR) Summary

Month	Master				Solar				TCLR (Max Daily Load – Average Daily Solar) (kWh)
	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	Max Daily (kWh)	Average Daily (kWh)	Min Daily (kWh)	Monthly Total (kWh)	
January	29,289	23,287	16,556	721,885	19,794	10,569	2,127	327,647	18,720
February	25,945	21,386	16,566	598,801	28,175	16,338	-112	457,460	9,607
March	24,550	19,064	15,838	590,978	36,044	21,858	3,487	677,605	2,692
April	19,555	17,688	16,193	530,643	37,269	23,375	-98	701,252	-3,820
May	27,690	21,573	17,358	668,777	39,078	27,235	7,831	844,270	455
June	37,724	29,506	24,713	885,193	39,793	29,232	12,419	876,958	8,492
July	56,358	46,605	40,200	1,444,762	38,977	27,896	3,831	864,781	28,462
August	58,043	46,958	39,494	1,455,699	37,710	26,316	10,802	815,786	31,727
September	41,642	29,990	24,019	899,700	36,396	24,544	7,270	736,330	17,098
October	25,626	21,165	17,642	656,123	33,096	18,285	1,111	566,822	7,341
November	22,506	18,399	16,018	551,968	25,162	12,296	839	368,866	10,210
December	28,208	20,804	17,179	644,929	13,122	8,162	656	253,008	20,046
Annual Total	—	—	—	**9,649,458**	—	—	—	**7,490,785**	**2,158,673**

31,727 kWh Max Daily TCLR (Year 15)

Scenario 3: BESS details

Five Tesla Megapack II XL with a total system size of 9,636 kW & 19,272 kWh (Year 1), was used in Scenario 3

Energy Storage

Tesla Commercial, with Acumen EMS™

Get Acumen Quote

19.3MWh Energy Capacity | $658 Cost per kWh | $7.89 Savings per kWh

System Details

Cost:	$12,690,290
Duration:	2 hr
Charge Power	9,636 kW
Discharge Power:	9,636 kW
Depth of Discharge:	100%
RT Efficiency:	91.97%
Degradation:	0.03
Qty / Model:	(5) Tesl...
End of Life:	Replace
Annual Cycles:	32.21
Annual Energy Discharge:	595,355 kWh
Annual Energy Losses:	31,900 kWh
Exports Offset:	4%

ETB Controller Settings

Required License:
ETB Controller with Acumen AI
Strategy:
Demand Charge Management (DCM)
Export to Grid:
True
Charge From PV:
True

Costs and Incentives

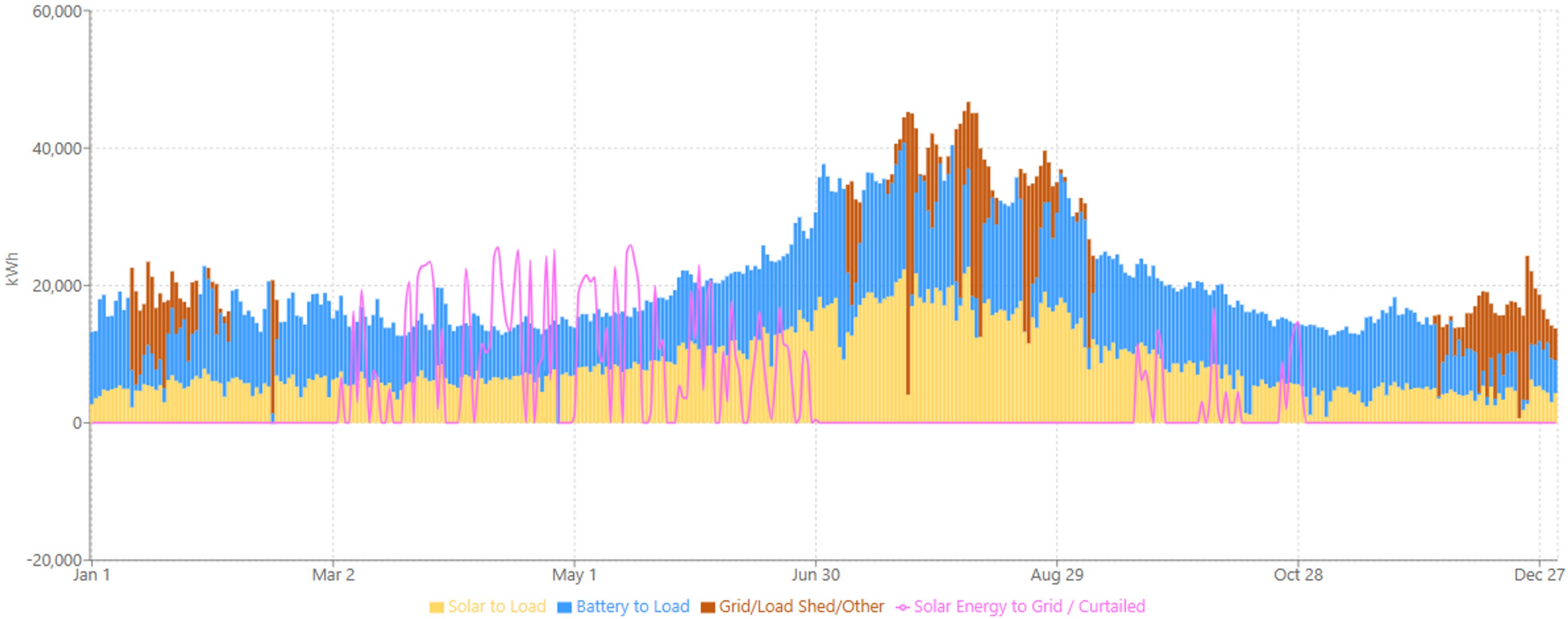
Total ESS Cost:	$12,690,290
Federal MACRS, Bonus Depreciation - 20% (2026 Place in Service) (ESS):	($3,236,024)
Investment Tax Credit (ITC) - 30% (with Adders) (ESS):	($3,807,087)
State - 10 year straight line Depreciation (ESS):	($1,015,223)
Net ESS Cost:	$4,631,956

Scenario 3: Diesel generator and solar resilience analysis

Clean Coalition

- **Generator Specs:**
  - Model: Cummins 2500DQLC
  - Rated Output: 2,490 kW
  - Fuel tank (sub-tank): 4,200 gallons
  - Fuel Type: Diesel
- **Step 1: Estimate Energy Content of Diesel**
  - 1 gallon of diesel contains ≈ 37.95 kWh of thermal energy.
  - Total thermal energy = 4,200 gal × 37.95 kWh/gal = 159,390 kWh (thermal)
- **Step 2: Estimate Generator Efficiency**
  - Most large diesel generators run at ~30% to 40% efficiency, converting thermal energy to electricity.
  - Let's assume a 35% efficiency (a realistic midpoint for a large generator like this):
    - Usable electrical energy = 159,390 × 0.35 = **55,787 kWh** (electric)
- **BLP Minimum resilience duration of Diesel generator and solar (Year 1)**
  - BLP Max 24-hour is 46,699 kWh, occuring in August
  - Average 24-hour solar in August is 28,229 kWh
  - BESS energy capacity is 19,272 kWh
  - 55,787 kWh (diesel gen) + 28,229 kWh (solar) + 19,272 kWh (BESS) = 103,288 kWh
  - 103,288 kWh (diesel gen + solar + BESS) / 46,699 (Max 24-hour load) = 2.21 * 24 hours = **~53 hours**
  - **This is equal to ~53 hours of minimum resilience**
- **MLP Minimum resilience duration of Diesel generator and solar (Year 15)**
  - MLP Max 24-hour is 58,043 kWh, occuring in August
  - Average 24-hour solar in August is 26,316 kWh
  - BESS energy capacity in Year 1 is 12,742 kWh
  - 55,787 kWh (diesel gen) + 26,316 kWh (solar) + 12,742 kWh (BESS) = 94,845 kWh
  - 94,845 kWh (diesel gen + solar + BESS) / 58,043 (Max 24-hour load) = 1.63*24 hours = **~39 hours**
  - **This is equal to ~39 hours of minimum resilience**

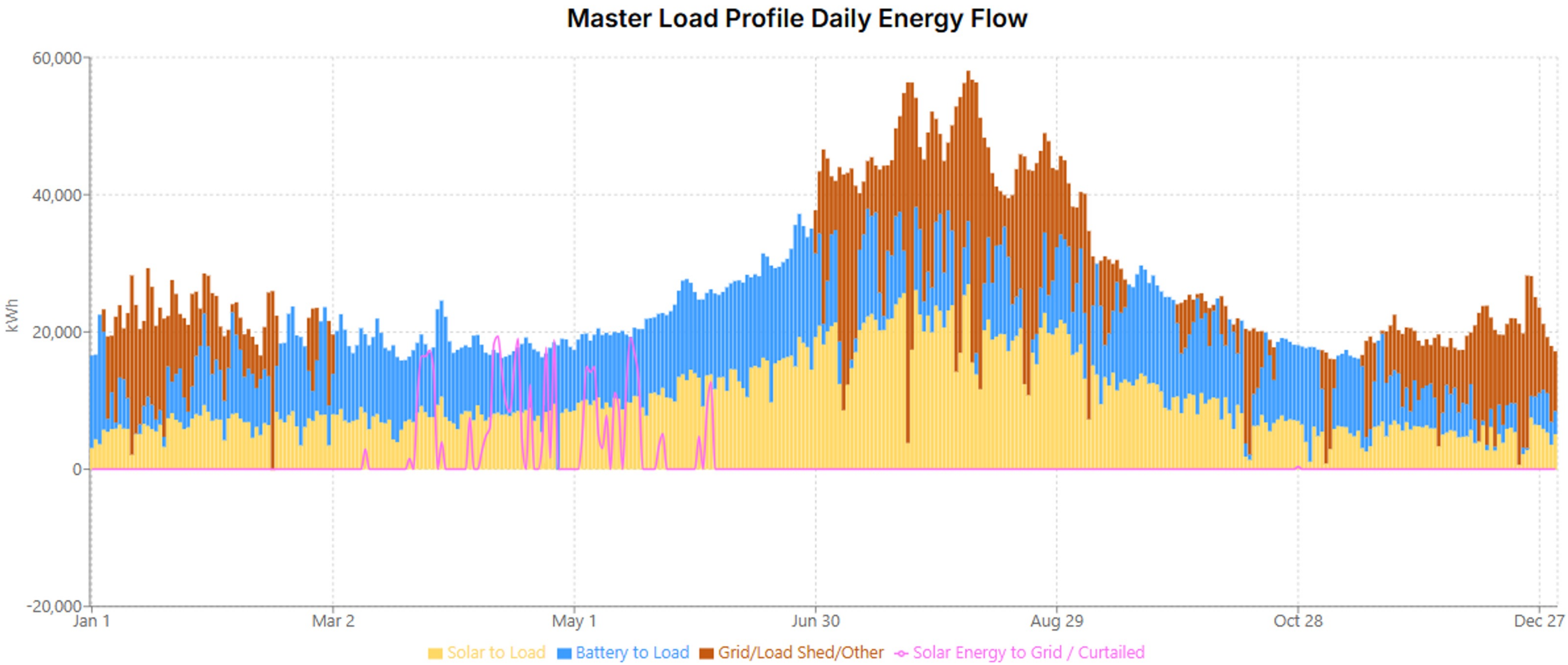
Energy Flow Diagram
4,980 kWac & 9,636 kW / 19,272 kWh (Year 1)



	Total Annual Load (kWh)	Annual Solar Generation (kWh)	Total Solar to Load (kWh)	Total Battery to Load (kWh)	Solar Energy to Grid/Curtailed (kWh)	Grid Import/Load Shed/Other (kWh)
Energy	7,719,316	8,035,336	3,157,612	3,647,675	1,307,137	914,026
Percentage of Load	100.0%	104.1%	40.9%	47.3%	16.9%	11.8%
Percentage of Solar	96.1%	100.0%	39.3%	45.4%	16.3%	11.4%

Energy Flow Diagram
4,980 kWac & 9,636 kW / 12,742 kWh (Year 15)

Clean Coalition



Master Profile Energy Flow Summary

	MLP Total Annual Load (kWh)	Annual Solar Generation (kWh)	Total Solar to Load (kWh)	Total Battery to Load (kWh)	Solar Energy to Grid/Curtailed (kWh)	Grid Import/Load Shed/Other (kWh)
Energy	9,649,459	7,490,782	3,720,127	3,371,142	449,839	2,558,187
Percentage of Load	100.0%	77.6%	38.5%	34.9%	4.7%	26.5%
Percentage of Solar	128.8%	100.0%	49.7%	45.0%	6.0%	34.1%

Total project costs

Clean Coalition

Fishers Island - Solar and BESS System Costs										
Site	Solar System Cost	Solar Cost Per W/dc	BESS Cost	Microgrid Capabilities Cost	BESS & Microgrid Capabilities Cost per kWh	Total Project Cost	30% Investment Tax Credit (ITC)	Federal MACRS, Bonus Depreciation - 20% (2026 Place in Service)	State 10 year straight line Depreciation	Total Net Project Cost
Fishers Island	$ (14,171,650)	$ 2.23	$ (11,640,290)	$ (1,050,000)	$ 658	$ (26,861,940)	$ 8,058,582	$ 6,849,795	$ 2,128,955	$ (9,824,608)

- **Scenario 3 project costs were simply calculated by increasing the solar system and BESS costs by 5x. The ITC and depreciation also increased accordingly.**
- **The microgrid capabilities costs stayed the same.**

Current electric bill vs bill after Solar and BESS (Year 1)

Fishers Island Scenario 3 Solar & BESS System Savings Based on the BLP (Year 1)						
Site	Electric Bill Cost		Energy Cost		Demand Cost	
	Before / After	Savings	Before / After	Savings	Before / After	Savings
Fishers Island	$1,076,965 / $115,248	$961,717	$791,428 / $0	$791,428	$279,837 / $109,548	$170,289

Scenario 3 - Cash flow analysis

Clean Coalition

Years	Project Costs	PV & Storage O&M / Equipment Replacement	Electric Bill Savings	PV Generation (kWh)	State Tax Effect	Federal Tax Effect	Total Cash Flow	Cumulative Cash Flow
Upfront	-$26,861,940	-	-	-	-	-	-$26,861,940	-$26,861,940
1	-	-$14,617	$961,717	8,042,506	$214,896	$10,524,508	$11,686,504	-$15,175,436
2	-	-$14,909	$1,000,761	8,002,293	$214,896	$1,753,547	$2,954,295	-$12,221,141
3	-	-$15,207	$1,041,305	7,962,081	$214,896	$1,052,128	$2,293,122	-$9,928,019
4	-	-$15,511	$1,083,402	7,921,868	$214,896	$631,277	$1,914,064	-$8,013,955
5	-	-$15,821	$1,127,106	7,881,655	$214,896	$631,277	$1,957,457	-$6,056,498
6	-	-$16,138	$1,172,471	7,841,443	$214,896	$315,639	$1,686,867	-$4,369,631
7	-	-$16,461	$1,219,555	7,801,230	$214,896	-	$1,417,990	-$2,951,642
8	-	-$16,790	$1,268,416	7,761,018	$214,896	-	$1,466,521	-$1,485,120
9	-	-$17,126	$1,319,114	7,720,805	$214,896	-	$1,516,884	$31,763
10	-	-$17,468	$1,371,711	7,680,593	$214,896	-	$1,569,139	$1,600,902
11	-	-$17,817	$1,426,270	7,640,380	-	-	$1,408,453	$3,009,355
12	-	-$18,174	$1,482,856	7,600,168	-	-	$1,464,682	$4,474,037
13	-	-$18,537	$1,541,534	7,559,955	-	-	$1,522,997	$5,997,034
14	-	-$18,908	$1,602,374	7,519,743	-	-	$1,583,466	$7,580,500
15	-	-$19,286	$1,665,443	7,479,530	-	-	$1,646,157	$9,226,657
16	-	-$6,987,227	$1,873,105	7,439,318	-	-	-$5,114,122	$4,112,534
17	-	-$20,065	$1,947,963	7,399,105	-	-	$1,927,898	$6,040,432
18	-	-$20,467	$2,025,625	7,358,893	-	-	$2,005,158	$8,045,590
19	-	-$20,876	$2,106,182	7,318,680	-	-	$2,085,306	$10,130,896
20	-	-$21,293	$2,189,732	7,278,468	-	-	$2,168,438	$12,299,335
21	-	-$21,719	$2,276,371	7,238,255	-	-	$2,254,651	$14,553,986
22	-	-$22,154	$2,366,199	7,198,043	-	-	$2,344,045	$16,898,031
23	-	-$22,597	$2,459,319	7,157,830	-	-	$2,436,723	$19,334,754
24	-	-$23,049	$2,555,836	7,117,617	-	-	$2,532,787	$21,867,541
25	-	-$23,510	$2,655,857	7,077,405	-	-	$2,632,347	$24,499,888
Totals:	**-$26,861,940**	**-$7,435,726**	**$41,740,222**	**188,998,882**	**$2,148,955**	**$14,908,377**	**$24,499,888**	**-**

Financial Metrics

Payback:	9.0 Years
ROI:	91.2%
10 Year IRR:	1.6%
20 Year IRR:	6.7%

Assumptions

Utility Escalator:	5.0%
Federal tax rate:	30.0%
State tax rate:	8.0%
Modeling:	Before Tax

- 5% Utility Cost Escalator
- Rate schedule: Large General Service (LGS) Sale-Resale (2025)
  - No Compensation for exported energy

Scenario 3 - resilience & economics summary

Clean Coalition

Solar Microgrid sizing

- Solar: 4,950 kWac, 6,355 kWdc solar
- BESS: 9,636 kW & 19,272 kWh

Economic results:

- Cash Purchase ($2.23/Wdc solar, $658/kWh BESS w/ microgrid capabilities) :
  - Total project cost: ($26,861,940)
  - 30% ITC: $8,058,582
  - Federal MACRS & Straight Line Depreciation: $6,849,795
  - Total net project cost: ($9,824,608)
  - Total 25 Year O&M cost: ($7,435,736)
  - 25 Year electric bill savings: $41,740,222
  - **25 Year net cumulative savings: $24,499,888**

Minimum solar+BESS+diesel resilience at year-15 (after 15 years of solar & BESS degradation):

- **BLP resilience duration:** 53 hours
- **MLP resilience duration:** 39 hours
- **BLP percentage of indefinite resilience**: 50%
- **MLP percentage of indefinite resilience**: 29%

Reporting and Recommendations:

- There is significant 25 Year net cumulative savings and resilience benefits in Scenario 3 compared to Scenarios 1 & 2.
- Seek feedback on how to proceed with the next step of the analysis.

APPENDIX

Key Analysis Steps

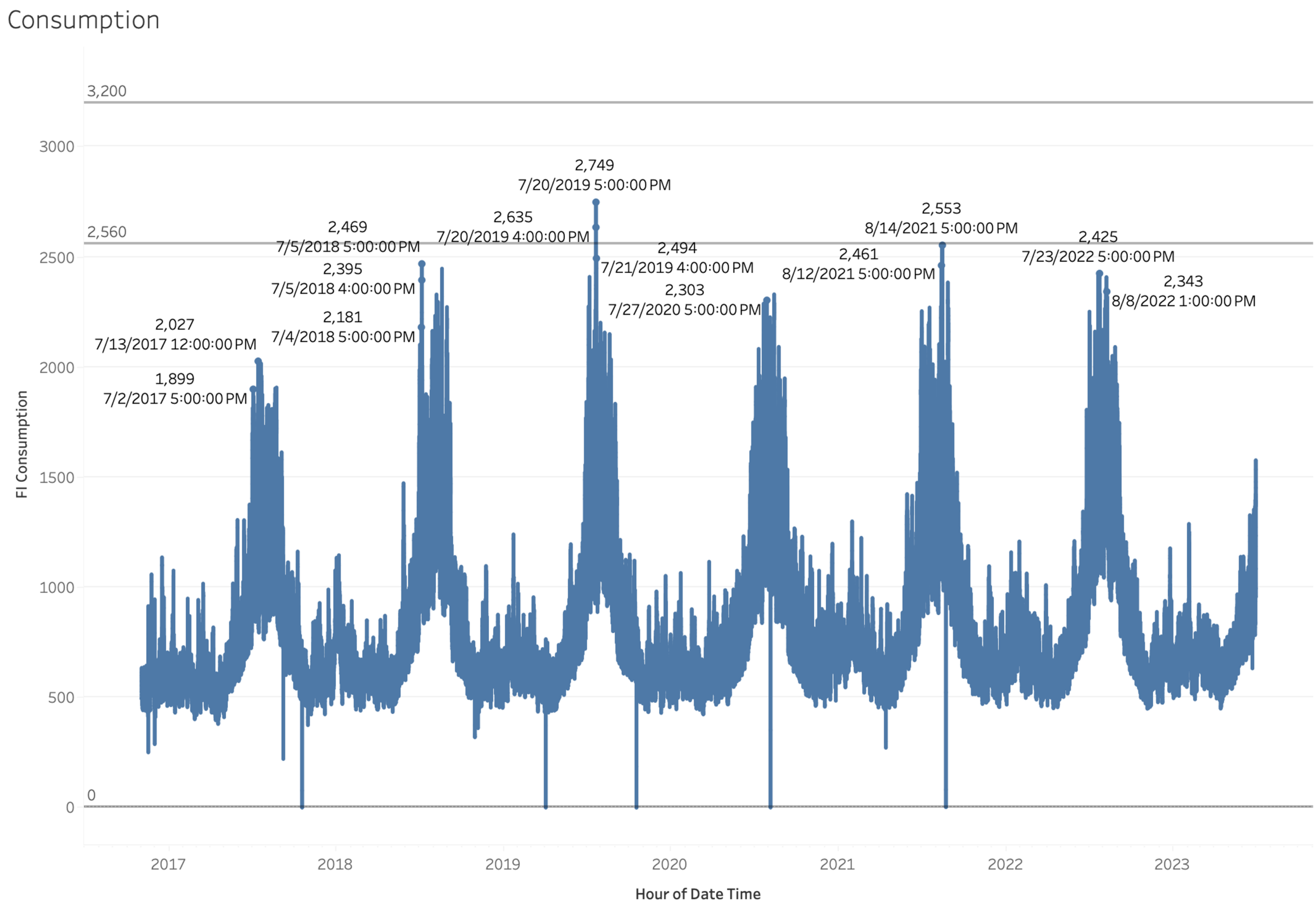
The Clean Coalition conducted the following steps to complete the initial feasibility study for the Fishers Island Community Microgrid:

- **Step 1: Establish Baseline Load Profile (BLP), Adjustment Load Profile (ALP), and Master Load Profile (MLP)**
    - **BLP**: Load data for calendar year 2022 (CY2022) was extracted from data provided by Pickett Power LLC
    - **ALP**: The BLP was multiplied by 0.25 at every 60-minute interval in order to account for a 25% increase in energy consumption by Year 2030.
    - **MLP**: The BLP was combined with the ALP at every 60-minute interval in order to create MLP.
    - **The MLP was used to analyze resilience and economics of all scenarios.**
- **Step 2: Define Solar Generation Profile (SGP) and Battery Energy Storage System (BESS) size**
    - **Scenario 1**: Solar production data was sourced from the 990 kWac Pickett Power Landfill Solar PV project. The "E_Grid" column in the 2024-12-09 5843.0 Fishers Island v1 spreadsheet was used to generate the Solar Generation Profile (SGP).
    - **Scenario 2** : The same SGP from Scenario 1 was used for Scenario 2, with the addition of a 1,927 kW / 3,854 kWh Tesla Megapack II XL.
    - **Scenario 3**: The SGP from Scenario 1 was multiplied by 5 at every 60-minute interval in order to create the SGP that pertains to 4,950 kWac solar, with the addition of a 9,636 kW & 19,272 kWh BESS.
- **Step 3: Analyze Resilience Using the Solar Microgrid Analysis Platform (SMAP)**
    - **All Scenarios**: Calculated the energy content of the diesel generator.
    - **All Scenarios:**: The MLP, SGP, and energy content of diesel generator were input into the Clean Coalition's Solar Microgrid Analysis Platform (SMAP), along with each of the BESS sizes for Scenarios 2 and 3. This enabled calculation of:
        - The percentage of load that could be served indefinitely by the solar & BESS.
        - The minimum duration for which full load could be served exclusively by the solar, BESS, and diesel generator.
- **Step 4: Perform Economic Analysis with Energy Toolbase (ETB)**
    - A custom rate schedule was created in ETB using the July 2024 Groton Utilities invoice.
    - The BLP and SGP were added, along with the BESS sizes according to their respective scenario.
    - Solar capex was based on the Pickett Solar Financing Model, with a 10% adder to account for anticipated import tariffs.
    - BESS capex was informed through consultation with Tim Hade, based on his substantial procurement experience.
    - Incentives applied included:
        - 30% Federal Investment Tax Credit (ITC)
        - Federal MACRS with 20% Bonus Depreciation
        - State – 10-year Straight Line Depreciation
    - A cash purchase transaction was modeled to assess project cash flow.
    - Opex assumptions included:
        - Annual solar panel cleanings
        - Inverter and BESS replacement in Year-15
- **Step 5: Summarize Results and Recommend Next Steps**
    - Economic and resilience performance results were summarized. Recommendations for next steps were provided based on the findings.

Load profiles used in this study

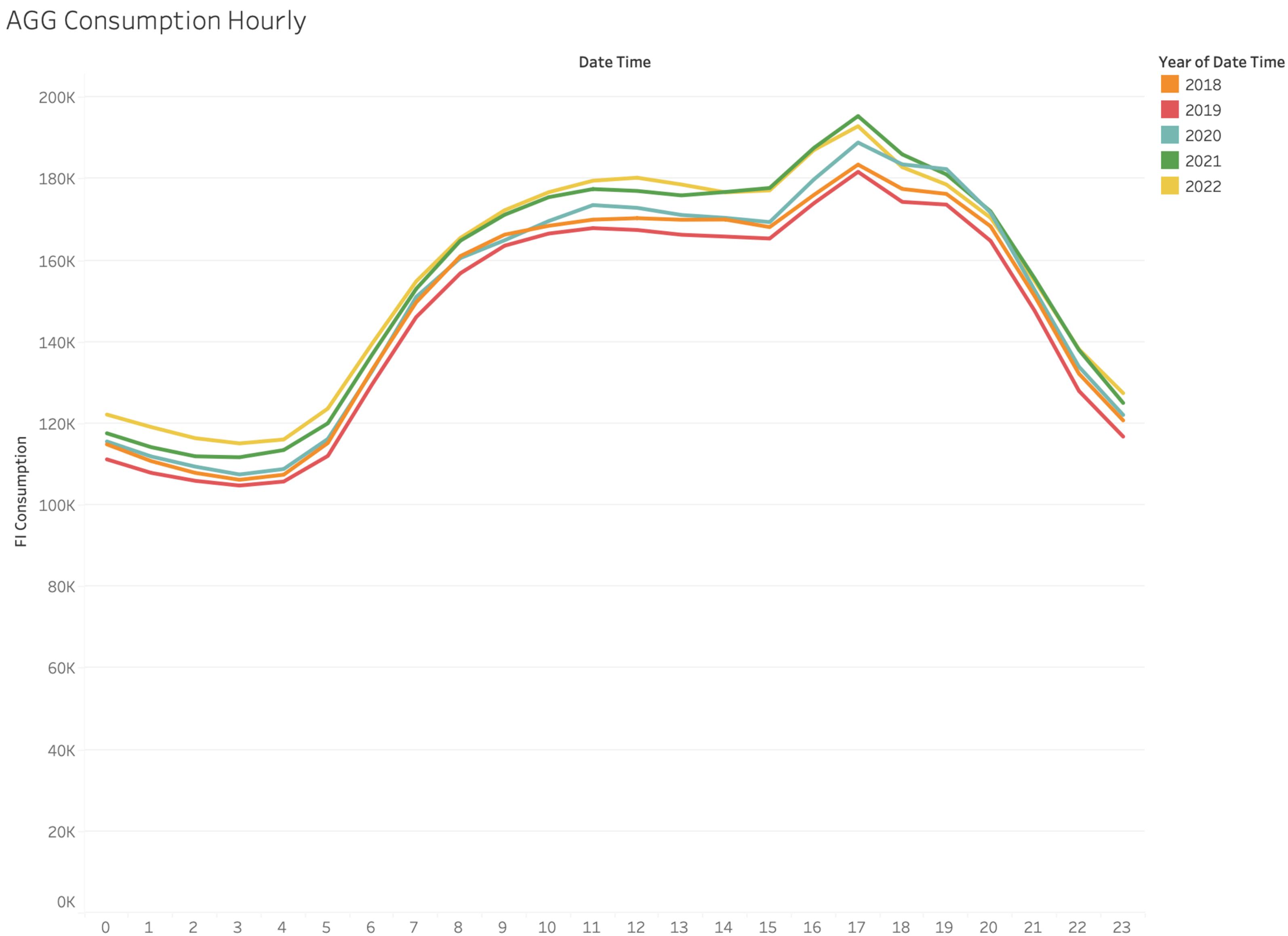
- **Baseline Load Profile (BLP):** This profile for Fishers Island uses CY2022 load data that the Clean Coalition pulled from the FI Consumption column of the Combined Data FIEC and CMEEC_V1 spreadsheet provided by Travis Garcelon. CY2022 was the most recent data available.
- **Adjustment Load Profile (ALP):** The ALP was created by multiplying the BLP by 0.25 at every 60-minute interval in order to account for a 25% increase in energy consumption by Year 2030.
- **Master Load Profile (MLP):** The MLP was created by combining the BLP with the ALP at every 60-minute interval.
- **Critical Load Profile (CLP)**: The CLP is considered to be 100% of the MLP.
- **Total Critical Load Required (TCLR)**: Maximum daily TCLRs are determined by calculating the maximum daily load of the BLP and/or MLP and subtracting the average daily solar generation for applicable month. The relative size of the BESS vs the maximum daily TCLRs determine overall resilience durations in the worst-case scenario. The average resilience durations will be much longer than the worst-case.

FI Consumption 2017-2023



The trend of sum of FI Consumption for Date Time Hour. The marks are labeled by sum of FI Consumption and Date Time Hour. The data is filtered on Date Time, which ranges from 11/1/2016 12:00:00 AM to 6/30/2023 12:00:00 AM.

Hourly FI Consumption 2018-2022



The trend of sum of FI Consumption for Date Time Hour. Color shows details about Date Time Year. The data is filtered on Date Time and Date Time Month. The Date Time filter ranges from 11/1/2016 12:00:00 AM to 6/30/2023 12:00:00 AM. The Date Time Month filter keeps June, July, August and September. The view is filtered on Date Time Year, which excludes 2017 and 2023.

FI Consumption hourly/month

AGG Consumption Hourly / Mo

The trend of sum of FI Consumption for Date Time Hour broken down by Date Time Month. Color shows details about Date Time Year. The data is filtered on Date Time, which ranges from 11/1/2016 12:00:00 AM to 6/30/2023 12:00:00 AM. The view is filtered on Date Time Month and Date Time Year. The Date Time Month filter keeps June, July, August and September. The Date Time Year filter excludes 2017 and 2023.

Pickett Solar Financing Model

Clean Coalition

Fishers Island - Pickett Power

Confidential Pro Forma

Project Details		
Project Name	Fishers Island - Pickett Power	
Address	Fishers	
City	Fishers Island - Pickett Power	
State/Province	NY	
NTP Date	5/1/2025	
COD Date	11/1/2025	
Contracted Project Term (Years)	25	
System Size (kWdc)	1,525.00 kW DC	From other WB / match to C20
System Production (kWh/kWp)	1188.00 kWh/kWp	

Fixed Assets	$	$/W	
Eligible Project Costs	$2,900,000	$1.90	from other WB
Ineligible Project Costs	$200,000	$0.13	
Total Project Costs	**$3,100,000**	**$2.03**	

Production	
Year 1 kWh Output	1,811,700
Annual Degradation (kWh	0.50%
Month	Generation Profile
1	4.34%
2	5.96%
3	8.43%
4	9.54%
5	11.18%
6	12.44%
7	11.54%
8	11.34%
9	8.78%
10	7.56%
11	4.71%
12	4.17%
Total	100.0%

Mission

To accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise.

Renewable Energy End-Game

100% renewable energy; 25% local, interconnected within the distribution grid and ensuring resilience without dependence on the transmission grid; and 75% remote, fully dependent on the transmission grid for serving loads.

Clean Coalition Community & Solar Microgrids

Clean Coalition

Creating Groundbreaking Models

The Clean Coalition designs and stages cutting-edge Community Microgrid & Solar Microgrid projects that can be replicated in any utility service territory. By showcasing the value and feasibility of these projects, and the vast potential for siting distributed energy resources in the built environment, we're helping proliferate clean local energy and community resilience.

Facilitating Real-World Projects

At the Clean Coalition, we base our work on concrete project experience. The projects we design highlight the regulatory and policy issues that are impeding the development of clean local energy projects, and the tools and best practices needed to overcome those barriers.

Benefits of a Solar Microgrid

Clean Coalition

- Economic
  - Provides electricity costs savings compared to buying electricity from the utility.
  - Provides value-of-resilience (VOR) compared to implementing & operating a fossil-fueled generator.
  - Provides a fixed cost of electricity compared to rapidly rising utility costs.
- Environmental
  - Provides solar electricity, a pure renewable energy resource.
  - Optimizes grid citizenship by reducing peak usage of the grid when it is most stressed, during the peak periods, which throughout California are currently 4-9pm.
  - Eliminates energy losses associated with traversing transmission & distribution grids. Losses are due to resistance and congestion, both of which are generally exacerbated by distance. Typically, 15% of remotely generated energy is lost.
  - Reduces the environmental impact of central generation, which typically consumes open space for the generation & transmission assets.
- Resilience
  - Provides 100% ride-through during grid outages of limited durations. Any ride-through duration can be accommodated with cost being correlated to duration.
  - Provides optionality for indefinite resilience for at least the most critical loads, again with cost being correlated to the percentage of load being served with 100% resilience.
  - Accommodates optional fossil generation as an emergency backup resource that can be minimized.

Clean Coalition Solar Microgrid Methodology

Clean Coalition

Step 1

Load Profiles

- Baseline: Historic site energy use
- Adjustment: Future anticipated loads (EVs, electrification)
- Master: Baseline + Adjustment Profiles
- Critical: Mission-critical, life-sustaining loads that warrant 100% resilience

Tools:

- Clean Coalition's Solar Microgrid Analysis Platform (SMAP)
- UtilityAPI

Step 2

Resource Scenarios

- Design & size solar and Battery Energy Storage Systems (BESS)
- Run shading analyses + energy modeling
- Determine resilience based on different resource scenarios

Tools:

- Helioscope
- Clean Coalition's SMAP

Step 3

Site Layouts

- Best practices when performing site walks
- Identifying critical load pathways
- Mapping site layouts

Tools:

- Clean Coalition's site walk checklist and photo instructions
- Site layout templates
- Google Slides/ PowerPoint

Step 4

Economic Analysis

- Analyze cash purchase vs. PPA economic transactions
- Apply financial incentives such as the Investment Tax Credit (ITC), Self Generation Incentive Program (SGIP), and depreciation.
- Assess the Value of Resilience

Tools:

- Energy Toolbase Developer
- Clean Coalition's SMAP

Step 5

Reporting & Recommendations

- Create final reports with key visuals and summary tables
- Present findings and propose next steps

Tools:

- Energy Toolbase Developer
- Google Slides/PowerPoint

Load profile types

Load Type	Definition
Baseline load profile	The historical annual usage of electrical loads per site that forms the basis for creating the master load profile.
Adjustment load profile	Adjustments for anticipated EV Charging Infrastructure (EVCI), electrification, energy efficiency, and new facilities.
Master load profile	The forecasted annual load profile used for this study's analysis, created from the baseline load profile plus adjustments for anticipated EV Charging Infrastructure (EVCI), electrification, energy efficiency, and new facilities.
Critical load profile	Annual load profile of the critical loads.
Critical loads	Electrical loads that are necessary to be provided with 100% energy resilience during grid outages
Total Critical Load Required (TCLR)	Total amount of energy required to serve the critical loads over the specified time period.