Neil Harrigan
Dinisco Design
99 Chauncy Street, Suite 901
Boston, MA 02111

Re: Feasibility Study Summary
Project Name: Fox Hill Elementary ("Project")
Project Address: Fox Hill Rd, Burlington, MA 01803
Intended Use: Summary of Solar +/- Storage feasibility study

Dear Neil Harrigan,

SDA has proposed three onsite renewable energy options for the Fox Hill Elementary School in Burlington MA. SDA used Helioscope, a solar production modeling software, and Energy Tool Base, a Solar PV financial Modeling software, to run a preliminary design. SDA utilized the expected annual electrical consumption of the building based on the Gross EUI and Gross Area from Thornton Tomasetti's 100% Schematic Design Energy Analysis report for LEED and MA Stretch Code (TEDI). These values were used to calculate the annual energy consumption of the building, and a similar example load profile from the DOE OpenEI database for a school was adjusted accordingly. As the project advances, the 8760 data from the building energy model can be used to create a more accurate building load profile

Solar PV Option 1: Rooftop PV
Proposes a rooftop hybrid ballasted system, with a total system size of 272KW_dc (240KW-ac) connected behind the building's utility meter. The estimated upfront cost for this option is $597,520 (using a conservative estimate of $2.20/W), NPV of $1,193,809 with an estimated total Incentive for the lifetime of the system of $619,988, ROI of 430.8%, and a payback period of 4.4 Years. The system is expected to provide a maximum 46% renewable energy offset of the building consumption loads.

Solar PV Option 2: Rooftop PV + Canopy PV + ESS
Proposes a Rooftop PV (272KW_dc) a Canopy PV (349 KWDc) system and a BESS (250KW, 1.152 MWhr), with a total system size of490KW_dc (620.8KW-ac) connected behind the building's utility meter. The estimated upfront cost for this option is $3,007,020.00 (using a conservative estimate of $2.20/W roof PV, $3.75/W Canopy PV, $986/KWh for BESS and controls), NPV of $1,690,191 with an estimated total Incentive for the lifetime of the system of $2,446,729, ROI of 158.5% and a payback period of 7.7 Years. The system is expected to provide a maximum 100% renewable energy offset of the building consumption loads, reduce utility electrical demand by peak shaving, and provide resiliency.

Solar PV Option 3: Rooftop PV + Canopy PV – ESS

Proposes a Rooftop PV (272KW_dc) and Canopy PV (349 KWDc) system, with a total system size of 490KW_dc (620.8KW-ac) connected behind the building's utility meter. The estimated upfront cost for this option is $1,901,020.00 (using a conservative estimate of $2.20/W roof PV, $3.75/W Canopy PV), NPV of $1,283,417 with an estimated total Incentive for the lifetime of the system of $1,495,229, ROI of 186.0% and a payback period of 8 Years. The system is expected to provide a maximum 100% renewable energy offset of the building consumption loads.

System Option	Total Solar Name Nameplate (KW_Dc)	Total Solar Name Nameplate (KW_Ac)	Total BESS Name Nameplate (KW_Ac,MWhr)	Upfront Payment ($)	NPV ($)	IRR (%)	ROI (%)	Payback Period (Years)	Total Incentive ($)	LCOE ($/kWh)
1. Roof PV	272.00	240.00	NA	$ 597,520	$ 1,193,809	22.5%	430.8%	4.4	$ 619,988	$ (0.003)
2. Roof PV + Canopy PV + BESS	490.00	620.80	250KWac, 1.2MWhr	$3,007,020	$ 1,690,191	11.4%	158.5%	7.7	$ 2,446,729	$ 0.035
3. Roof PV + Canopy PV	490.00	620.80	NA	$1,901,020	$ 1,283,417	11.9%	186.0%	8.0	$ 1,495,229	$ 0.026

Glossary

- BESS — Battery Energy Storage System
- DOE: — Department of Energy
- ESS: — Energy Storage System
- Gross Area: — The total area of the building is Usable and Non-usable space. Unconditioned and conditioned space.
- Gross EUI: (Also: EUI / Site EUI:) — Energy Use Intensity. All energy sources used by the building, such as electricity, natural gas, renewables, and delivered fuels. Calculated as: Annual Energy Use *(KBtu/Yr)* per Gross area*(ft^2)*
- IRR: — Internal rate of return
- LCOE: — Levelized Cost of Energy
- NPV: — Net Present Value
- Payback Period: — The length of time it takes to recover the cost of investment
- PV: — Photovoltaic “Solar”
- ROI: — Return on Investment
- SDA: — Solar Design Associates
- SMART: — Solar Massachusetts Renewable Target
- LEED: — Leadership in Energy and Environmental Design certification
- TEDI: — Thermal Energy Demand Intensity
- Upfront Cost: (Also: Upfront Payment) — An initial payment or sum of money that is owed before a purchase.

Sincerely,

Steven J. Strong

Steven J. Strong, President
Solar Design Associates, Inc.
August 07, 2024

Solar System Financial Assessment for Dinisco - Fox Hill Elementary School
Roof PV

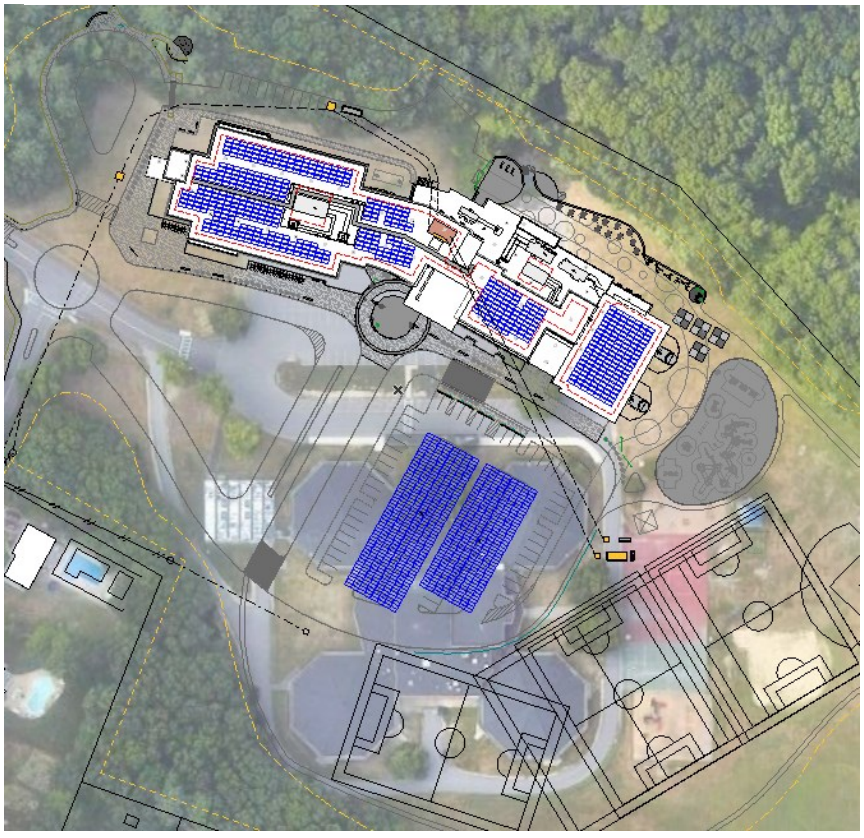
Prepared For

Dinisco - Fox Hill Elementary School

Prepared By

Stephen Coffrin
(978) 391-9842
scoffrin@solardesign.com

Revised
7/18/2024



Proposed rooftop photovoltaic array for the Dinisco - Fox Hill Elementary School

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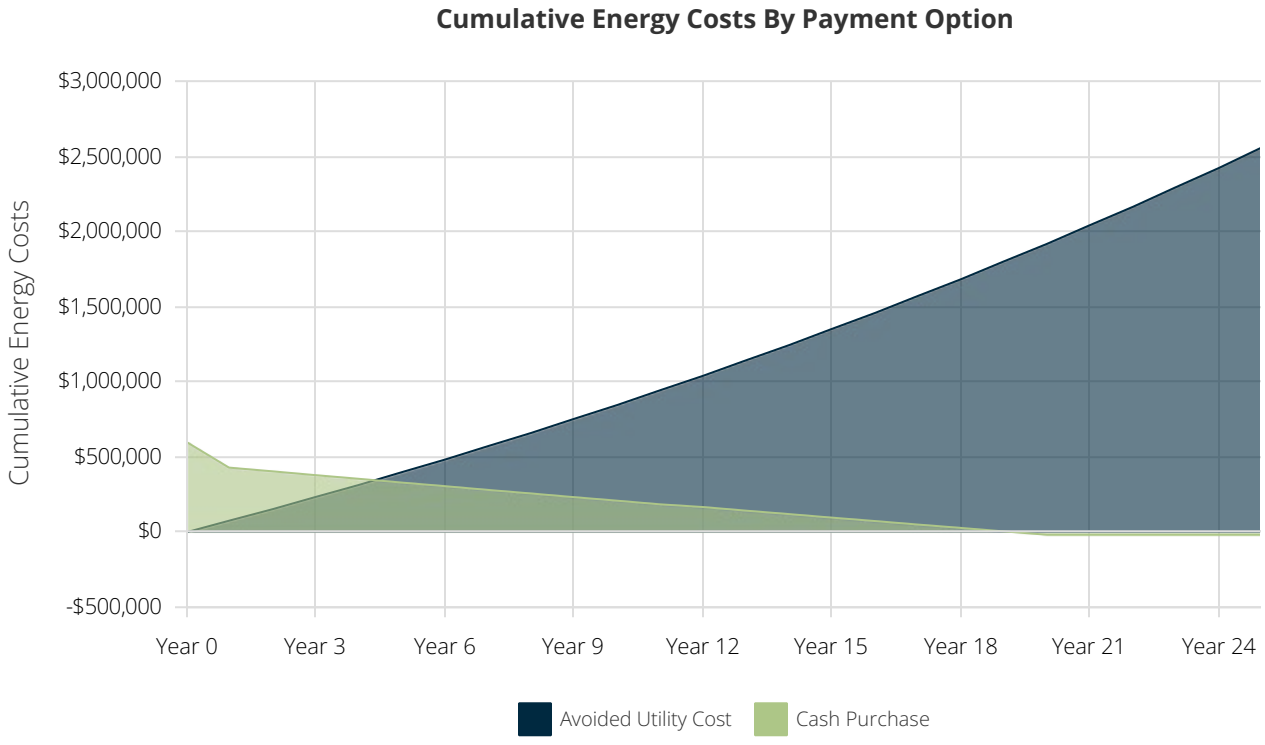
1 Project Summary

Payment Options	Cash Purchase
IRR - Term	22.5%
LCOE PV Generation	($0.003) /kWh
Net Present Value	$1,193,809
Payback Period	4.4 Years
Total Payments	$597,520
Total Incentives	$619,988
Net Payments	($22,468)
Electric Bill Savings - Term	$2,556,500
Upfront Payment	$597,520

Combined Solar PV Rating
Power Rating: 271.6 kW-DC
Power Rating 240.0 kW-AC

Combined ESS Ratings
Energy Capacity: 0.0 kWh
Power Rating: 0.0 kW

The total PV system cost not including batteries is based on a $/W value of $2.20/Wdc. This estimate is a good, somewhat conservative starting point for a system of this design and size. This will be subject to change as the specific system components are chosen.



1.1.1 PV System Details

General Information
Facility: Meter #1
Address: Fox Hill Rd Burlington MA 01803

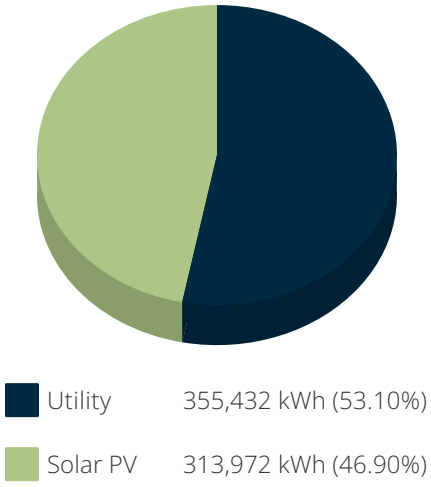
Solar PV Equipment Description*
Solar Panels: (560) Hanwha Q Cells Q.Peak DUO XL-G10.3/BFG 485
Inverters: (2) SolarEdge SE120K (480V)

Solar PV Equipment Typical Lifespan
Solar Panels: Greater than 30 Years
Inverters: 15 Years

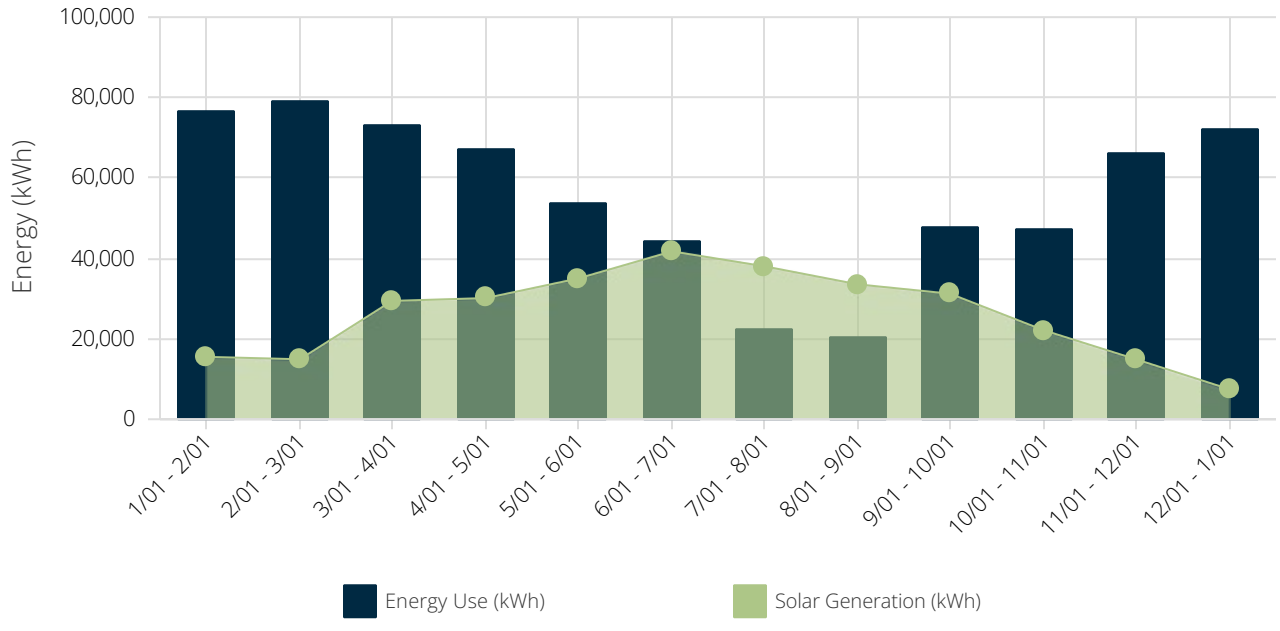
Solar PV System Cost and Incentives	
Solar PV System Cost	$597,520
Direct pay - 24% ITC PV	-$143,405
(SMART) Program - PV	-$476,583
Net Solar PV System Cost	**-$22,468**

Solar PV System Rating
Power Rating: 271.6 kW-DC
Power Rating: 240.0 kW-AC

Energy Consumption Mix
Annual Energy Use: 669,404 kWh



Monthly Energy Use vs Solar Generation



**Equipment chosen as the basis of design will be subject to change as the project progresses. The chosen QCell module is on the high end of mid-to-premium range modules, and final wattage may fluctuate somewhat. The SolarEdge & SMA inverters are one of the most specified inverters.*

1.1.2 Rebates and Incentives

This section summarizes all incentives available for this project. The actual rebate and incentive amounts for this project are shown in each example.

Direct Pay, Investment Tax Credit (ITC) - 24% For PV

The Inflation Reduction Act (IRA) of 2022 contains a "direct pay" provision that enables certain tax-exempt customers, including state and local government, to receive a direct cash payment in lieu of an investment tax credit (ITC). Entities that qualify for direct pay are eligible to receive a 24% direct payment, assuming they meet the IRA established prevailing wage and apprenticeship requirements in order to qualify for the full 24% “increased rate”, rather than a 6% “base rate”. The IRA states that direct pay is only available for entities, including: an entity exempt from the tax, any State government (or political subdivision thereof), the Tennessee Valley Authority, an Indian tribal government, an Alaska Native Corporation, any corporation operating on a cooperative basis which is engaged in furnishing electric energy to persons in rural areas. These entities may take direct pay for solar and storage in the ITC and PTC as well as the ITC/PTC when tech neutral starts after 2025.

Total Incentive Value: $143,405

Solar Massachusetts Renewable Target (SMART) - PV Incentive

Massachusetts SMART Tariff for those considering installing a Behind-the-Meter System (Tariff Generation Unit under the SMART Program.) The Solar Massachusetts Renewable Target (SMART) Program is the newest program established to support the development of solar in Massachusetts. The DOER regulation in 225 CMR 20.00 sets the regulatory framework for the program. The tariff based incentive is paid directly by the utility company to the system owner, following the approval of the application by the Solar Program Administrator. The SMART Program is a 1600MW declining block incentive program. Eligible projects must be interconnected by one of three investor owned utility companies in Massachusetts: Eversource, National Grid, and Unitil. Each utility has established blocks that decline in incentive rates between each block. If adding Energy Storage to the Proposal and claiming the SMART Tariff make sure to enter the Energy Storage Adder on the Excel calculator to include it in the total incentive value.

Total Incentive Value: $476,583

1.1.3 Current Electric Bill

The table below shows the assumed annual electricity costs.

Rate Schedule: NSTAR - B2

Time Periods	Energy Use (kWh)	Max Demand (kW)	Charges			
Bill Ranges & Seasons	Total	NC / Max	Other	Energy	Demand	Total
1/1/2024 - 2/1/2024 W1	76,503	344	$20	$23,308	$11,984	$35,312
2/1/2024 - 3/1/2024 W1	79,181	357	$20	$24,124	$12,450	$36,594
3/1/2024 - 4/1/2024 W1	73,061	328	$20	$22,259	$11,410	$33,689
4/1/2024 - 5/1/2024 W1	66,940	300	$20	$20,395	$10,405	$30,820
5/1/2024 - 6/1/2024 W1	53,935	242	$20	$16,432	$8,324	$24,777
6/1/2023 - 7/1/2023 S1	44,372	201	$20	$13,519	$10,196	$23,734
7/1/2023 - 8/1/2023 S2	22,186	99	$20	$4,907	$4,751	$9,678
8/1/2023 - 9/1/2023 S2	20,273	92	$20	$4,484	$4,377	$8,881
9/1/2023 - 10/1/2023 S2	47,815	214	$20	$10,576	$10,890	$21,485
10/1/2023 - 11/1/2023 W2	47,050	210	$20	$10,407	$4,436	$14,863
11/1/2023 - 12/1/2023 W2	66,175	296	$20	$14,637	$6,343	$21,000
12/1/2023 - 1/1/2024 W2	71,913	322	$20	$15,906	$6,920	$22,846
Total	669,404	-	$240	$180,953	$102,486	$283,679

1.1.4 New Electric Bill

Rate Schedule: NSTAR - B2

Time Periods	Solar PV (kWh)	Energy Import (kWh)	Energy Export (kWh)	Max Demand (kW)	Charges			
Bill Ranges & Seasons	Total	Total	Total	NC / Max	Other	Energy	Demand	Total
1/1/2024 - 2/1/2024 W1	15,508	65,041	4,046	327	$20	$19,614	$11,374	$31,008
2/1/2024 - 3/1/2024 W1	14,919	66,957	2,695	325	$20	$20,265	$11,302	$31,587
3/1/2024 - 4/1/2024 W1	29,424	49,370	5,733	307	$20	$14,755	$10,656	$25,431
4/1/2024 - 5/1/2024 W1	30,134	43,163	6,357	274	$20	$12,833	$9,472	$22,325
5/1/2024 - 6/1/2024 W1	34,995	29,790	10,850	210	$20	$8,534	$7,176	$15,730
6/1/2023 - 7/1/2023 S1	41,747	16,559	13,934	159	$20	$4,348	$7,954	$12,322
7/1/2023 - 8/1/2023 S2	38,058	5,813	21,686	66	$20	$201	$2,989	$3,211
8/1/2023 - 9/1/2023 S2	33,540	5,084	18,350	57	$20	$207	$2,509	$2,736
9/1/2023 - 10/1/2023 S2	31,225	26,872	10,281	185	$20	$5,430	$9,342	$14,791
10/1/2023 - 11/1/2023 W2	22,103	29,741	4,794	173	$20	$6,338	$3,615	$9,974
11/1/2023 - 12/1/2023 W2	14,905	53,011	1,741	278	$20	$11,638	$5,944	$17,602
12/1/2023 - 1/1/2024 W2	7,414	66,201	1,702	314	$20	$14,557	$6,743	$21,320
Total	313,972	457,602	102,169	-	$240	$118,720	$89,076	$208,036

Annual Electricity Savings: $75,643

2.1 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	22.5%	Net Present Value	$1,193,809	Payback Period	4.4 Years
ROI	430.8%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$597,520				

Years	Project Costs	Inverter Replacement	Direct pay - 24% ITC PV	(SMART) Program - PV	Electric Bill Savings	Total Cash Flow	Cumulative Cash Flow
Upfront	-$597,520	-	-	-	-	-$597,520	-$597,520
1	-	-	$143,405	$25,118	$75,643	$244,166	-$353,354
2	-	-	-	$24,982	$77,492	$102,474	-$250,880
3	-	-	-	$24,846	$79,383	$104,230	-$146,651
4	-	-	-	$24,711	$81,318	$106,029	-$40,622
5	-	-	-	$24,575	$83,298	$107,873	$67,252
6	-	-	-	$24,440	$85,324	$109,763	$177,015
7	-	-	-	$24,304	$87,396	$111,699	$288,714
8	-	-	-	$24,168	$89,515	$113,683	$402,397
9	-	-	-	$24,033	$91,683	$115,716	$518,113
10	-	-	-	$23,897	$93,901	$117,798	$635,911
11	-	-	-	$23,761	$96,169	$119,930	$755,841
12	-	-$5,000	-	$23,626	$98,488	$117,114	$872,955
13	-	-	-	$23,490	$100,861	$124,351	$997,305
14	-	-	-	$23,354	$103,287	$126,641	$1,123,946
15	-	-	-	$23,219	$105,767	$128,986	$1,252,932
16	-	-	-	$23,083	$108,304	$131,387	$1,384,319
17	-	-	-	$22,948	$110,898	$133,845	$1,518,164
18	-	-	-	$22,812	$113,549	$136,361	$1,654,525
19	-	-	-	$22,676	$116,260	$138,937	$1,793,462
20	-	-	-	$22,541	$119,032	$141,573	$1,935,035
21	-	-	-	-	$121,865	$121,865	$2,056,900
22	-	-	-	-	$124,761	$124,761	$2,181,661
23	-	-	-	-	$127,721	$127,721	$2,309,382
24	-	-	-	-	$130,747	$130,747	$2,440,129
25	-	-	-	-	$133,839	$133,839	$2,573,968
Totals:	-$597,520	-$5,000	$143,405	$476,583	$2,556,500	$2,573,968	-

State and Federal income tax rates, as well as the discount rate, were left at their default values for this financial model. A more accurate model can be produced if the customer provides actual tax rates and desired discount rate.

2.2 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	22.5%	Net Present Value	$1,193,809	Payback Period	4.4 Years
ROI	430.8%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$597,520				

Years	Upfront	1	2	3	4	5	6	7	8	9	10	11	12
Cash													
Project Costs	-$597,520	-	-	-	-	-	-	-	-	-	-	-	-
Inverter Replacement	-	-	-	-	-	-	-	-	-	-	-	-	-$5,000
Direct pay - 24% ITC PV	-	$143,405	-	-	-	-	-	-	-	-	-	-	-
(SMART) Program - PV	-	$25,118	$24,982	$24,846	$24,711	$24,575	$24,440	$24,304	$24,168	$24,033	$23,897	$23,761	$23,626
Electric Bill Savings	-	$75,643	$77,492	$79,383	$81,318	$83,298	$85,324	$87,396	$89,515	$91,683	$93,901	$96,169	$98,488
Cash Total	-$597,520	$244,166	$102,474	$104,230	$106,029	$107,873	$109,763	$111,699	$113,683	$115,716	$117,798	$119,930	$117,114
Total Cash Flow	-$597,520	$244,166	$102,474	$104,230	$106,029	$107,873	$109,763	$111,699	$113,683	$115,716	$117,798	$119,930	$117,114
Cumulative Cash Flow	-$597,520	-$353,354	-$250,880	-$146,651	-$40,622	$67,252	$177,015	$288,714	$402,397	$518,113	$635,911	$755,841	$872,955

2.2 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	22.5%	Net Present Value	$1,193,809	Payback Period	4.4 Years
ROI	430.8%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$597,520				

Years	13	14	15	16	17	18	19	20	21	22	23
Cash											
Project Costs	-	-	-	-	-	-	-	-	-	-	-
Inverter Replacement	-	-	-	-	-	-	-	-	-	-	-
Direct pay - 24% ITC PV	-	-	-	-	-	-	-	-	-	-	-
(SMART) Program - PV	$23,490	$23,354	$23,219	$23,083	$22,948	$22,812	$22,676	$22,541	-	-	-
Electric Bill Savings	$100,861	$103,287	$105,767	$108,304	$110,898	$113,549	$116,260	$119,032	$121,865	$124,761	$127,721
Cash Total	$124,351	$126,641	$128,986	$131,387	$133,845	$136,361	$138,937	$141,573	$121,865	$124,761	$127,721
Total Cash Flow	$124,351	$126,641	$128,986	$131,387	$133,845	$136,361	$138,937	$141,573	$121,865	$124,761	$127,721
Cumulative Cash Flow	$997,305	$1,123,946	$1,252,932	$1,384,319	$1,518,164	$1,654,525	$1,793,462	$1,935,035	$2,056,900	$2,181,661	$2,309,382

2.2 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	22.5%	Net Present Value	$1,193,809	Payback Period	4.4 Years
ROI	430.8%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$597,520				

Years	24	25	Totals
Cash			
Project Costs	-	-	-$597,520
Inverter Replacement	-	-	-$5,000
Direct pay - 24% ITC PV	-	-	$143,405
(SMART) Program - PV	-	-	$476,583
Electric Bill Savings	$130,747	$133,839	$2,556,500
Cash Total	$130,747	$133,839	$2,573,968
Total Cash Flow	$130,747	$133,839	$2,573,968
Cumulative Cash Flow	$2,440,129	$2,573,968	-

Solar System Financial Assessment for Dinisco - Fox Hill Elementary School
Roof PV + Canopy PV - BESS

Prepared For

Dinisco - Fox Hill Elementary School

Prepared By

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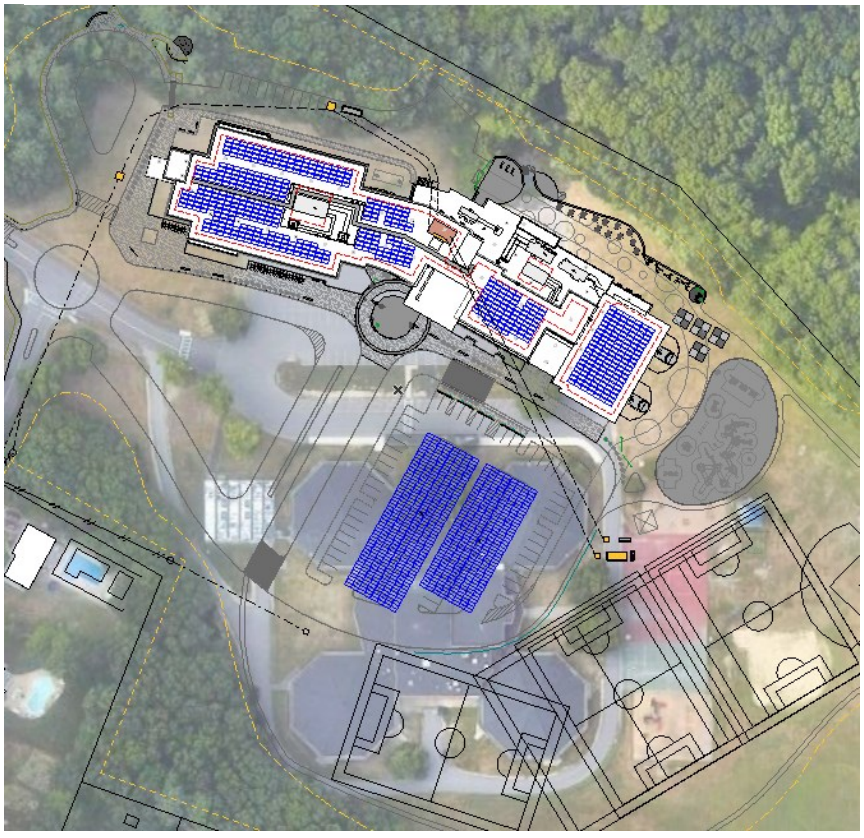


Proposed rooftop photovoltaic array for the Dinisco - Fox Hill Elementary School

Table of Contents

1 Project Summary

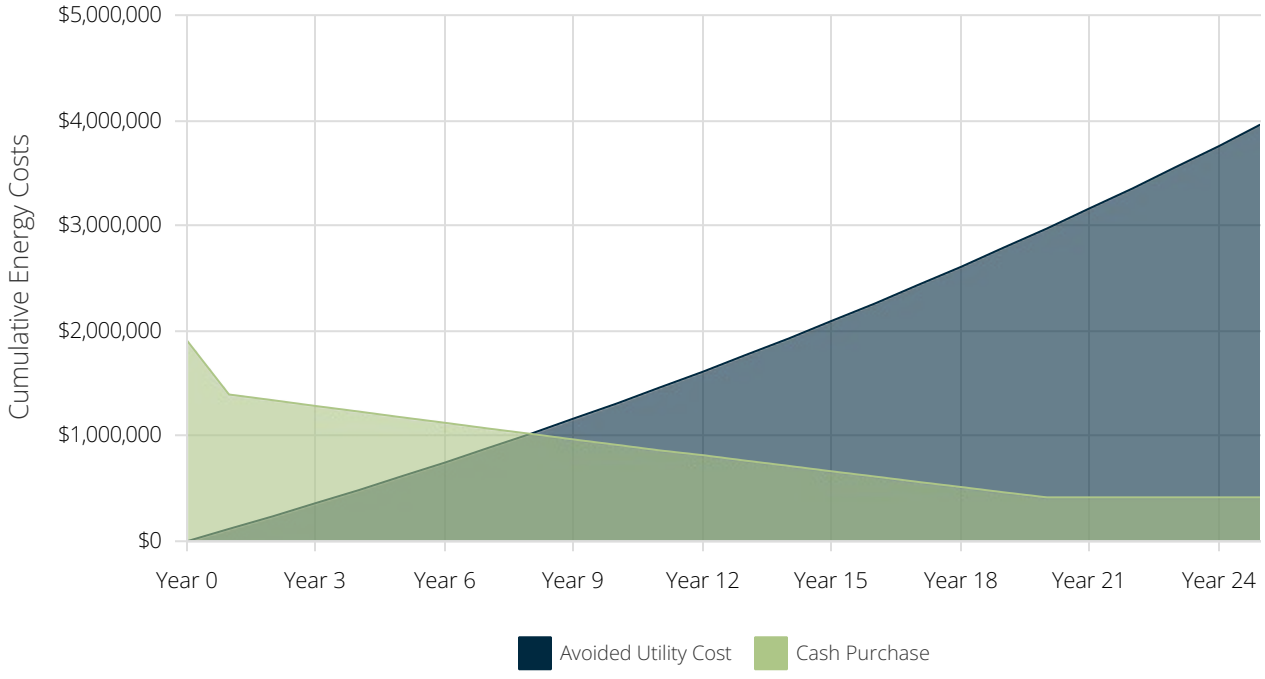
Payment Options	Cash Purchase
IRR - Term	11.9%
LCOE PV Generation	$0.026 /kWh
Net Present Value	$1,283,417
Payback Period	8.0 Years
Total Payments	$1,907,020
Total Incentives	$1,495,229
Net Payments	$411,791
Electric Bill Savings - Term	$3,963,036
Upfront Payment	$1,907,020

Combined Solar PV Rating
Power Rating: 620.8 kW-DC
Power Rating 490.0 kW-AC

Combined ESS Ratings
Energy Capacity: 0.0 kWh
Power Rating: 0.0 kW

The total PV system cost not including batteries is based on a $/W value of $3.07/Wdc. This estimate is a good, somewhat conservative starting point for a system of this design and size. This will be subject to change as the specific system components are chosen.

Cumulative Energy Costs By Payment Option



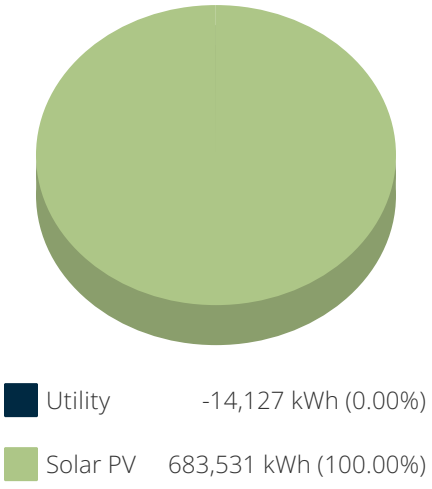
1.1.1 PV System Details

General Information
Facility: Meter #1
Address: Fox Hill Rd Burlington MA 01803

Solar PV System Rating
Power Rating: 620.8 kW-DC
Power Rating: 490.0 kW-AC

Solar PV Equipment Description*
Solar Panels: (1280) Hanwha Q Cells Q.Peak DUO XL-G10.3/BFG 485
Inverters: (2) SolarEdge SE120K (480V) , (2) SMA Sunny Highpower PEAK3 125-US

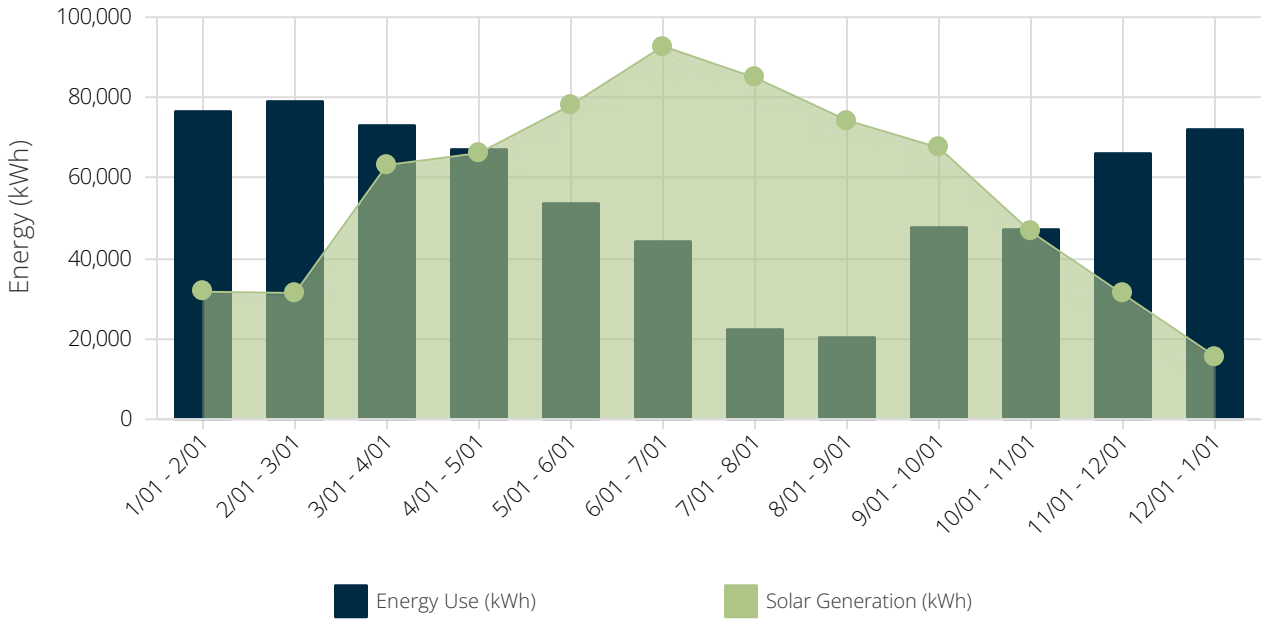
Energy Consumption Mix
Annual Energy Use: 669,404 kWh



Solar PV Equipment Typical Lifespan
Solar Panels: Greater than 30 Years
Inverters: 15 Years

Solar PV System Cost and Incentives	
Solar PV System Cost	$1,907,020
Direct pay - 24% ITC PV	-$457,685
(SMART) Program - PV	-$1,037,544
Net Solar PV System Cost	**$411,791**

Monthly Energy Use vs Solar Generation



**Equipment chosen as the basis of design will be subject to change as the project progresses. The chosen QCell module is on the high end of mid-to-premium range modules, and final wattage may fluctuate somewhat. The SolarEdge & SMA inverters are one of the most specified inverters.*

1.1.2 Rebates and Incentives

This section summarizes all incentives available for this project. The actual rebate and incentive amounts for this project are shown in each example.

Direct Pay, Investment Tax Credit (ITC) - 24% For PV

The Inflation Reduction Act (IRA) of 2022 contains a "direct pay" provision that enables certain tax-exempt customers, including state and local government, to receive a direct cash payment in lieu of an investment tax credit (ITC). Entities that qualify for direct pay are eligible to receive a 24% direct payment, assuming they meet the IRA established prevailing wage and apprenticeship requirements in order to qualify for the full 24% “increased rate”, rather than a 6% “base rate”. The IRA states that direct pay is only available for entities, including: an entity exempt from the tax, any State government (or political subdivision thereof), the Tennessee Valley Authority, an Indian tribal government, an Alaska Native Corporation, any corporation operating on a cooperative basis which is engaged in furnishing electric energy to persons in rural areas. These entities may take direct pay for solar and storage in the ITC and PTC as well as the ITC/PTC when tech neutral starts after 2025.

Total Incentive Value: $457,685

Solar Massachusetts Renewable Target (SMART) - PV Incentive

Massachusetts SMART Tariff for those considering installing a Behind-the-Meter System (Tariff Generation Unit under the SMART Program.) The Solar Massachusetts Renewable Target (SMART) Program is the newest program established to support the development of solar in Massachusetts. The DOER regulation in 225 CMR 20.00 sets the regulatory framework for the program. The tariff based incentive is paid directly by the utility company to the system owner, following the approval of the application by the Solar Program Administrator. The SMART Program is a 1600MW declining block incentive program. Eligible projects must be interconnected by one of three investor owned utility companies in Massachusetts: Eversource, National Grid, and Unitil. Each utility has established blocks that decline in incentive rates between each block. If adding Energy Storage to the Proposal and claiming the SMART Tariff make sure to enter the Energy Storage Adder on the Excel calculator to include it in the total incentive value.

Total Incentive Value: $1,037,544

1.1.3 Current Electric Bill

The table below shows the assumed annual electricity costs.

Rate Schedule: NSTAR - B2

Time Periods	Energy Use (kWh)	Max Demand (kW)	Charges			
Bill Ranges & Seasons	Total	NC / Max	Other	Energy	Demand	Total
1/1/2024 - 2/1/2024 W1	76,503	344	$20	$23,308	$11,984	$35,312
2/1/2024 - 3/1/2024 W1	79,181	357	$20	$24,124	$12,450	$36,594
3/1/2024 - 4/1/2024 W1	73,061	328	$20	$22,259	$11,410	$33,689
4/1/2024 - 5/1/2024 W1	66,940	300	$20	$20,395	$10,405	$30,820
5/1/2024 - 6/1/2024 W1	53,935	242	$20	$16,432	$8,324	$24,777
6/1/2023 - 7/1/2023 S1	44,372	201	$20	$13,519	$10,196	$23,734
7/1/2023 - 8/1/2023 S2	22,186	99	$20	$4,907	$4,751	$9,678
8/1/2023 - 9/1/2023 S2	20,273	92	$20	$4,484	$4,377	$8,881
9/1/2023 - 10/1/2023 S2	47,815	214	$20	$10,576	$10,890	$21,485
10/1/2023 - 11/1/2023 W2	47,050	210	$20	$10,407	$4,436	$14,863
11/1/2023 - 12/1/2023 W2	66,175	296	$20	$14,637	$6,343	$21,000
12/1/2023 - 1/1/2024 W2	71,913	322	$20	$15,906	$6,920	$22,846
Total	669,404	-	$240	$180,953	$102,486	$283,679

1.1.4 New Electric Bill

Rate Schedule: NSTAR - B2

Time Periods	Solar PV (kWh)	Energy Import (kWh)	Energy Export (kWh)	Max Demand (kW)	Charges			
Bill Ranges & Seasons	Total	Total	Total	NC / Max	Other	Energy	Demand	Total
1/1/2024 - 2/1/2024 W1	31,711	54,112	9,319	316	$20	$16,020	$10,979	$27,020
2/1/2024 - 3/1/2024 W1	31,391	54,986	7,195	301	$20	$16,393	$10,441	$26,854
3/1/2024 - 4/1/2024 W1	63,218	39,940	30,097	284	$20	$10,664	$9,831	$20,515
4/1/2024 - 5/1/2024 W1	66,183	32,668	31,911	273	$20	$8,357	$9,436	$17,814
5/1/2024 - 6/1/2024 W1	78,140	20,701	44,906	208	$20	$4,062	$7,104	$11,186
6/1/2023 - 7/1/2023 S1	92,761	10,348	58,737	159	$20	$216	$7,954	$8,190
7/1/2023 - 8/1/2023 S2	84,946	3,641	66,400	57	$20	$2,515	$2,509	$14
8/1/2023 - 9/1/2023 S2	74,338	3,328	57,393	57	$20	$2,134	$2,509	$395
9/1/2023 - 10/1/2023 S2	67,516	20,203	39,904	180	$20	$2,473	$9,075	$11,568
10/1/2023 - 11/1/2023 W2	46,572	23,784	23,306	173	$20	$4,095	$3,615	$7,731
11/1/2023 - 12/1/2023 W2	31,101	44,691	9,617	266	$20	$9,404	$5,678	$15,102
12/1/2023 - 1/1/2024 W2	15,654	61,079	4,820	314	$20	$13,268	$6,743	$20,031
Total	683,531	369,481	383,605	-	$240	$80,304	$85,874	$166,419

Annual Electricity Savings: $117,261

2.1 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	11.9%	Net Present Value	$1,283,417	Payback Period	8.0 Years
ROI	186.0%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$1,907,020				

Years	Project Costs	Inverter Replacement	Direct pay - 24% ITC PV	(SMART) Program - PV	Electric Bill Savings	Total Cash Flow	Cumulative Cash Flow
Upfront	-$1,907,020	-	-	-	-	-$1,907,020	-$1,907,020
1	-	-	$457,685	$54,682	$117,261	$629,628	-$1,277,392
2	-	-	-	$54,387	$120,126	$174,513	-$1,102,879
3	-	-	-	$54,092	$123,058	$177,150	-$925,729
4	-	-	-	$53,797	$126,058	$179,855	-$745,874
5	-	-	-	$53,501	$129,127	$182,628	-$563,246
6	-	-	-	$53,206	$132,267	$185,473	-$377,773
7	-	-	-	$52,911	$135,479	$188,390	-$189,383
8	-	-	-	$52,615	$138,764	$191,380	$1,997
9	-	-	-	$52,320	$142,125	$194,445	$196,442
10	-	-	-	$52,025	$145,563	$197,588	$394,030
11	-	-	-	$51,730	$149,079	$200,808	$594,838
12	-	-$5,000	-	$51,434	$152,675	$199,109	$793,947
13	-	-	-	$51,139	$156,352	$207,491	$1,001,438
14	-	-	-	$50,844	$160,113	$210,956	$1,212,394
15	-	-	-	$50,548	$163,958	$214,507	$1,426,901
16	-	-	-	$50,253	$167,891	$218,144	$1,645,045
17	-	-	-	$49,958	$171,911	$221,869	$1,866,914
18	-	-	-	$49,663	$176,022	$225,684	$2,092,598
19	-	-	-	$49,367	$180,225	$229,592	$2,322,190
20	-	-	-	$49,072	$184,521	$233,593	$2,555,783
21	-	-	-	-	$188,913	$188,913	$2,744,696
22	-	-	-	-	$193,402	$193,402	$2,938,098
23	-	-	-	-	$197,991	$197,991	$3,136,089
24	-	-	-	-	$202,681	$202,681	$3,338,771
25	-	-	-	-	$207,474	$207,474	$3,546,245
Totals:	-$1,907,020	-$5,000	$457,685	$1,037,544	$3,963,036	$3,546,245	-

State and Federal income tax rates, as well as the discount rate, were left at their default values for this financial model. A more accurate model can be produced if the customer provides actual tax rates and desired discount rate.

2.2 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	11.9%	Net Present Value	$1,283,417	Payback Period	8.0 Years
ROI	186.0%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$1,907,020				

Years	Upfront	1	2	3	4	5	6	7	8	9	10	11
Cash												
Project Costs	-$1,907,020	-	-	-	-	-	-	-	-	-	-	-
Inverter Replacement	-	-	-	-	-	-	-	-	-	-	-	-
Direct pay - 24% ITC PV	-	$457,685	-	-	-	-	-	-	-	-	-	-
(SMART) Program - PV	-	$54,682	$54,387	$54,092	$53,797	$53,501	$53,206	$52,911	$52,615	$52,320	$52,025	$51,730
Electric Bill Savings	-	$117,261	$120,126	$123,058	$126,058	$129,127	$132,267	$135,479	$138,764	$142,125	$145,563	$149,079
Cash Total	-$1,907,020	$629,628	$174,513	$177,150	$179,855	$182,628	$185,473	$188,390	$191,380	$194,445	$197,588	$200,808
Total Cash Flow	-$1,907,020	$629,628	$174,513	$177,150	$179,855	$182,628	$185,473	$188,390	$191,380	$194,445	$197,588	$200,808
Cumulative Cash Flow	-$1,907,020	-$1,277,392	-$1,102,879	-$925,729	-$745,874	-$563,246	-$377,773	-$189,383	$1,997	$196,442	$394,030	$594,838

2.2 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	11.9%	Net Present Value	$1,283,417	Payback Period	8.0 Years
ROI	186.0%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$1,907,020				

Years	12	13	14	15	16	17	18	19	20	21	22
Cash											
Project Costs	-	-	-	-	-	-	-	-	-	-	-
Inverter Replacement	-$5,000	-	-	-	-	-	-	-	-	-	-
Direct pay - 24% ITC PV	-	-	-	-	-	-	-	-	-	-	-
(SMART) Program - PV	$51,434	$51,139	$50,844	$50,548	$50,253	$49,958	$49,663	$49,367	$49,072	-	-
Electric Bill Savings	$152,675	$156,352	$160,113	$163,958	$167,891	$171,911	$176,022	$180,225	$184,521	$188,913	$193,402
Cash Total	$199,109	$207,491	$210,956	$214,507	$218,144	$221,869	$225,684	$229,592	$233,593	$188,913	$193,402
Total Cash Flow	$199,109	$207,491	$210,956	$214,507	$218,144	$221,869	$225,684	$229,592	$233,593	$188,913	$193,402
Cumulative Cash Flow	$793,947	$1,001,438	$1,212,394	$1,426,901	$1,645,045	$1,866,914	$2,092,598	$2,322,190	$2,555,783	$2,744,696	$2,938,098

2.2 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	11.9%	Net Present Value	$1,283,417	Payback Period	8.0 Years
ROI	186.0%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$1,907,020				

Years	23	24	25	Totals
Cash				
Project Costs	-	-	-	-$1,907,020
Inverter Replacement	-	-	-	-$5,000
Direct pay - 24% ITC PV	-	-	-	$457,685
(SMART) Program - PV	-	-	-	$1,037,544
Electric Bill Savings	$197,991	$202,681	$207,474	$3,963,036
Cash Total	$197,991	$202,681	$207,474	$3,546,245
Total Cash Flow	$197,991	$202,681	$207,474	$3,546,245
Cumulative Cash Flow	$3,136,089	$3,338,771	$3,546,245	-

Solar System Financial Assessment for Dinisco - Fox Hill Elementary School
Roof PV + Canopy PV + BESS

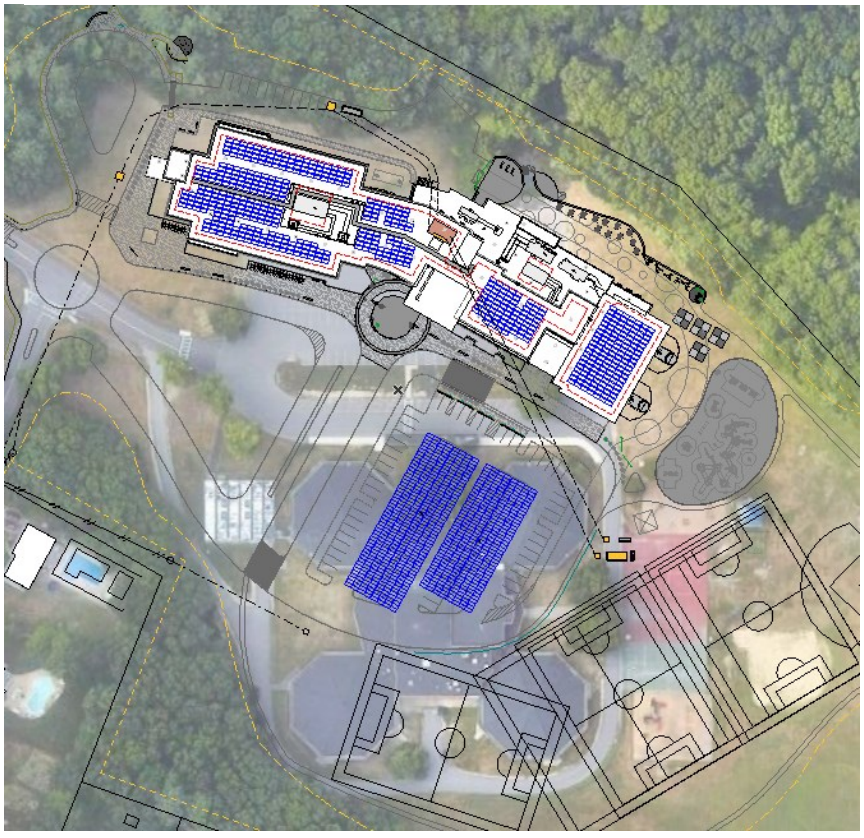
Prepared For

Dinisco - Fox Hill Elementary School

Prepared By

Stephen Coffrin
(978) 391-9842
scoffrin@solardesign.com

Revised
7/17/2024



Proposed rooftop photovoltaic array for the Dinisco - Fox Hill Elementary School

Table of Contents

1 Project Summary

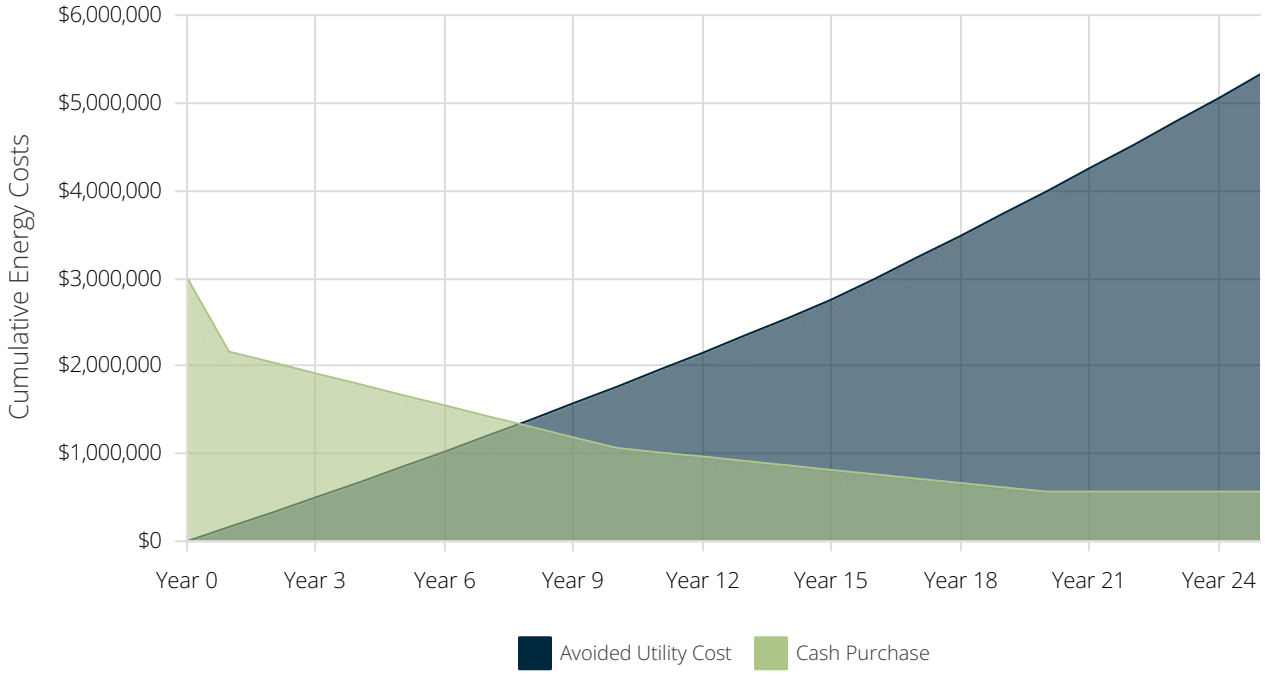
Payment Options	Cash Purchase
IRR - Term	11.4%
LCOE PV Generation	$0.035 /kWh
Net Present Value	$1,690,191
Payback Period	7.7 Years
Total Payments	$3,007,020
Total Incentives	$2,446,729
Net Payments	$560,291
Electric Bill Savings - Term	$5,330,740
Upfront Payment	$3,007,020

Combined Solar PV Rating
Power Rating: 620.8 kW-DC
Power Rating 490.0 kW-AC

Combined ESS Ratings
Energy Capacity: 1,116.0 kWh
Power Rating: 250.0 kW

The total PV system cost not including batteries is based on a $/W value of $3.07/Wdc. This estimate is a good, somewhat conservative starting point for a system of this design and size. This will be subject to change as the specific system components are chosen.

Cumulative Energy Costs By Payment Option



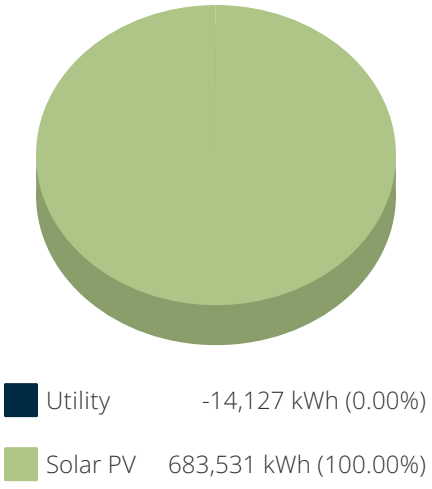
1.1.1 PV System Details

General Information
Facility: Meter #1
Address: Fox Hill Rd Burlington MA 01803

Solar PV System Rating
Power Rating: 620.8 kW-DC
Power Rating: 490.0 kW-AC

Solar PV Equipment Description*
Solar Panels: (1280) Hanwha Q Cells Q.Peak DUO XL-G10.3/BFG 485
Inverters: (2) SolarEdge SE120K (480V) , (2) SMA Sunny Highpower PEAK3 125-US

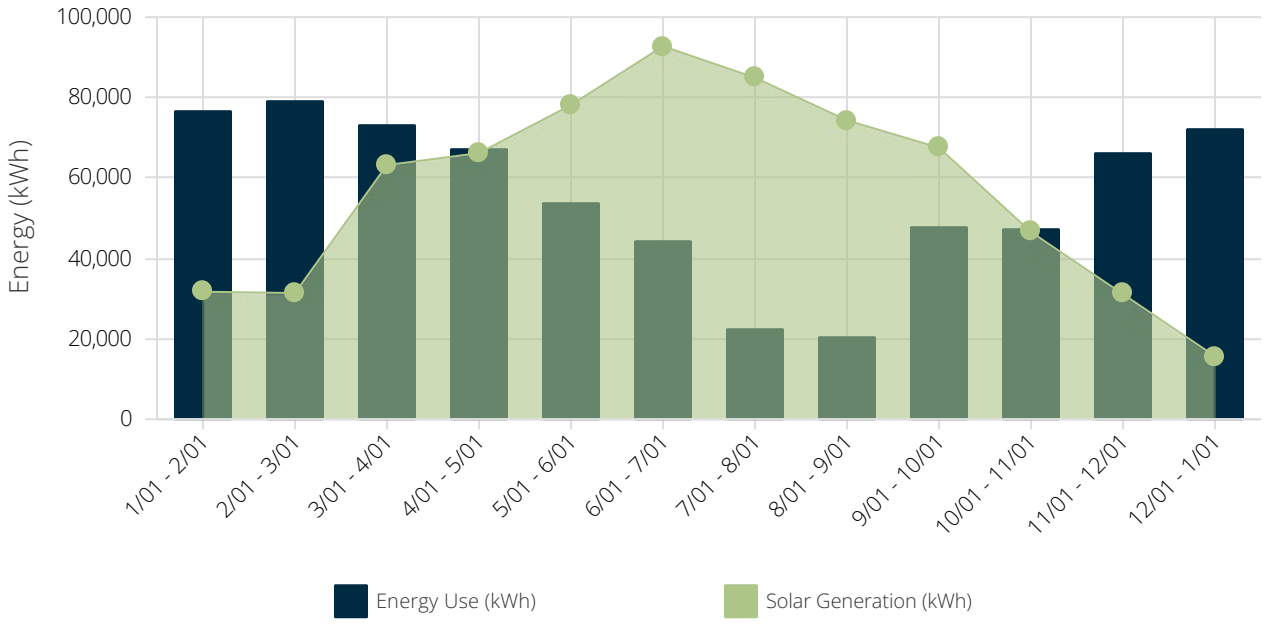
Energy Consumption Mix
Annual Energy Use: 669,404 kWh



Solar PV Equipment Typical Lifespan
Solar Panels: Greater than 30 Years
Inverters: 15 Years

Solar PV System Cost and Incentives	
Solar PV System Cost	$1,907,020
Direct pay - 24% ITC PV	-$457,685
(SMART) Program - PV	-$1,037,544
Net Solar PV System Cost	**$411,791**

Monthly Energy Use vs Solar Generation



**Equipment chosen as the basis of design will be subject to change as the project progresses. The chosen QCell module is on the high end of mid-to-premium range modules, and final wattage may fluctuate somewhat. The SolarEdge & SMA inverters are one of the most specified inverters.*

1.1.2 Energy Storage System (ESS) Details

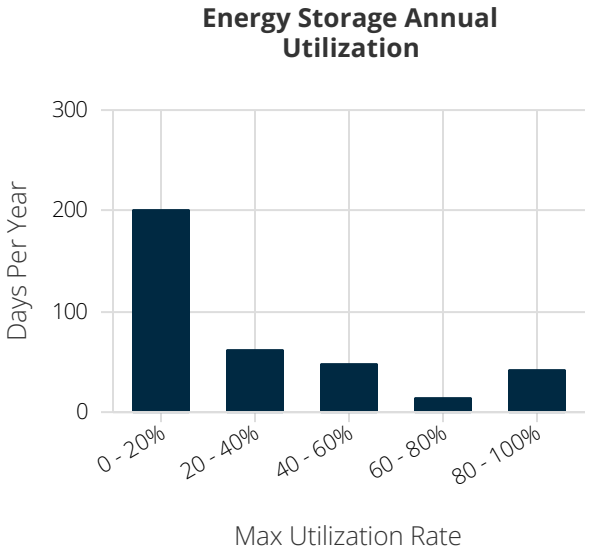
General Information
Facility: Meter #1
Address: Burlington MA 01803

ESS System Ratings
Energy Capacity: 1,116.0 kWh
Power Rating: 250.0 kW

ESS Equipment Description
Battery Banks: (1) Socomec HES L - 250kW / 1116kWh
Inverters: (1) Socomec HES L - 250kW / 1116kWh

ESS Equipment Typical Lifespan
Battery Banks: 15 Years
Inverters: 15 Years

ESS Cost and Incentives	
ESS Cost	$1,100,000
Direct Pay - 24% ITC BESS	-$264,000
Incentive Amount	-$687,500
Net ESS Cost	**$148,500**



Energy Output and Demand Savings From Solar PV and Energy Storage				
Date Range	ESS Energy Discharge (kWh)	Solar PV Generation (kWh)	ESS Energy as % of PV Energy	Total Demand Savings
1/1/2024 - 2/1/2024	2,546	31,711	8.03%	$2,583
2/1/2024 - 3/1/2024	5,136	31,391	16.36%	$2,404
3/1/2024 - 4/1/2024	10,210	63,218	16.15%	$7,355
4/1/2024 - 5/1/2024	10,693	66,183	16.16%	$7,535
5/1/2024 - 6/1/2024	6,032	78,140	7.72%	$3,839
6/1/2023 - 7/1/2023	9,886	92,761	10.66%	$8,808
7/1/2023 - 8/1/2023	3,081	84,946	3.63%	$4,484
8/1/2023 - 9/1/2023	3,444	74,338	4.63%	$4,377
9/1/2023 - 10/1/2023	5,833	67,516	8.64%	$2,989
10/1/2023 - 11/1/2023	10,835	46,572	23.27%	$2,573
11/1/2023 - 12/1/2023	6,654	31,101	21.39%	$1,797
12/1/2023 - 1/1/2024	2,537	15,654	16.21%	$1,153
Total	76,887	683,531	11.25%	$49,898

MA SMART program requires that all PV installations 500kWac and above to utilize a battery storage system in order to participate in the incentive program. The minimum requirements are the ESS power capacity must be at least 25% of the total solar DC capacity, and that the battery runtime at rated capacity must be at least 2 hours.

1.1.3 Rebates and Incentives

This section summarizes all incentives available for this project. The actual rebate and incentive amounts for this project are shown in each example.

Direct Pay, Investment Tax Credit (ITC) - 24% For PV

The Inflation Reduction Act (IRA) of 2022 contains a "direct pay" provision that enables certain tax-exempt customers, including state and local government, to receive a direct cash payment in lieu of an investment tax credit (ITC). Entities that qualify for direct pay are eligible to receive a 24% direct payment, assuming they meet the IRA established prevailing wage and apprenticeship requirements in order to qualify for the full 24% “increased rate”, rather than a 6% “base rate”. The IRA states that direct pay is only available for entities, including: an entity exempt from the tax, any State government (or political subdivision thereof), the Tennessee Valley Authority, an Indian tribal government, an Alaska Native Corporation, any corporation operating on a cooperative basis which is engaged in furnishing electric energy to persons in rural areas. These entities may take direct pay for solar and storage in the ITC and PTC as well as the ITC/PTC when tech neutral starts after 2025.

Total Incentive Value: $457,685

Solar Massachusetts Renewable Target (SMART) - PV Incentive

Massachusetts SMART Tariff for those considering installing a Behind-the-Meter System (Tariff Generation Unit under the SMART Program.) The Solar Massachusetts Renewable Target (SMART) Program is the newest program established to support the development of solar in Massachusetts. The DOER regulation in 225 CMR 20.00 sets the regulatory framework for the program. The tariff based incentive is paid directly by the utility company to the system owner, following the approval of the application by the Solar Program Administrator. The SMART Program is a 1600MW declining block incentive program. Eligible projects must be interconnected by one of three investor owned utility companies in Massachusetts: Eversource, National Grid, and Unitil. Each utility has established blocks that decline in incentive rates between each block. If adding Energy Storage to the Proposal and claiming the SMART Tariff make sure to enter the Energy Storage Adder on the Excel calculator to include it in the total incentive value.

Total Incentive Value: $1,037,544

Direct Pay, Investment Tax Credit (ITC) - 24% For BESS

The Inflation Reduction Act (IRA) of 2022 contains a "direct pay" provision that enables certain tax-exempt customers, including state and local government, to receive a direct cash payment in lieu of an investment tax credit (ITC). Entities that qualify for direct pay are eligible to receive a 24% direct payment, assuming they meet the IRA established prevailing wage and apprenticeship requirements in order to qualify for the full 24% “increased rate”, rather than a 6% “base rate”. The IRA states that direct pay is only available for entities, including: an entity exempt from the tax, any State government (or political subdivision thereof), the Tennessee Valley Authority, an Indian tribal government, an Alaska Native Corporation, any corporation operating on a cooperative basis which is engaged in furnishing electric energy to persons in rural areas. These entities may take direct pay for solar and storage in the ITC and PTC as well as the ITC/PTC when tech neutral starts after 2025.

Total Incentive Value: $264,000

Connected Solutions - SDA 10 Year Term

Example connected solution, assuming 45 events between June 1 and September 30

Total Incentive Value: $687,500

1.1.4 Current Electric Bill

The table below shows the assumed annual electricity costs.

Rate Schedule: NSTAR - B2

Time Periods	Energy Use (kWh)	Max Demand (kW)	Charges			
Bill Ranges & Seasons	Total	NC / Max	Other	Energy	Demand	Total
1/1/2024 - 2/1/2024 W1	76,503	344	$20	$23,308	$11,984	$35,312
2/1/2024 - 3/1/2024 W1	79,181	357	$20	$24,124	$12,450	$36,594
3/1/2024 - 4/1/2024 W1	73,061	328	$20	$22,259	$11,410	$33,689
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7/1/2023 - 8/1/2023 S2	22,186	99	$20	$4,907	$4,751	$9,678
8/1/2023 - 9/1/2023 S2	20,273	92	$20	$4,484	$4,377	$8,881
9/1/2023 - 10/1/2023 S2	47,815	214	$20	$10,576	$10,890	$21,485
10/1/2023 - 11/1/2023 W2	47,050	210	$20	$10,407	$4,436	$14,863
11/1/2023 - 12/1/2023 W2	66,175	296	$20	$14,637	$6,343	$21,000
12/1/2023 - 1/1/2024 W2	71,913	322	$20	$15,906	$6,920	$22,846
Total	669,404	-	$240	$180,953	$102,486	$283,679

1.1.5 New Electric Bill

Rate Schedule: NSTAR - B2

Time Periods	Solar PV (kWh)	Energy Import (kWh)	Energy Export (kWh)	Max Demand (kW)	Charges			
Bill Ranges & Seasons	Total	Total	Total	NC / Max	Other	Energy	Demand	Total
1/1/2024 - 2/1/2024 W1	31,711	53,141	8,183	272	$20	$15,781	$9,401	$25,202
2/1/2024 - 3/1/2024 W1	31,391	51,934	3,810	290	$20	$15,632	$10,046	$25,699
3/1/2024 - 4/1/2024 W1	63,218	31,750	21,243	123	$20	$8,611	$4,054	$12,686
4/1/2024 - 5/1/2024 W1	66,183	23,588	22,136	90	$20	$6,080	$2,870	$8,970
5/1/2024 - 6/1/2024 W1	78,140	16,152	39,965	135	$20	$2,923	$4,485	$7,428
6/1/2023 - 7/1/2023 S1	92,761	1,282	50,100	36	$20	$2,114	$1,388	$707
7/1/2023 - 8/1/2023 S2	84,946	1,540	64,099	15	$20	$2,864	$267	$2,577
8/1/2023 - 9/1/2023 S2	74,338	792	54,633	6	$20	$2,556	$0	$2,536
9/1/2023 - 10/1/2023 S2	67,516	15,935	35,256	158	$20	$1,762	$7,900	$9,682
10/1/2023 - 11/1/2023 W2	46,572	14,151	12,969	94	$20	$2,481	$1,863	$4,365
11/1/2023 - 12/1/2023 W2	31,101	40,616	5,109	215	$20	$8,728	$4,547	$13,295
12/1/2023 - 1/1/2024 W2	15,654	59,954	3,531	270	$20	$13,084	$5,767	$18,871
Total	683,531	310,835	321,034	-	$240	$67,547	$52,589	$120,376

Annual Electricity Savings: $163,304

2.1 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	11.4%	Net Present Value	$1,690,191	Payback Period	7.7 Years
ROI	158.5%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$3,007,020				

Years	Project Costs	Inverter Replacement	Direct pay - 24% ITC PV	(SMART) Program - PV	Direct Pay - 24% ITC BESS	Incentive Amount	Electric Bill Savings	Total Cash Flow	Cumulative Cash Flow
Upfront	-$3,007,020	-	-	-	-	-	-	-$3,007,020	-$3,007,020
1	-	-	$457,685	$54,682	$264,000	$68,750	$163,304	$1,008,421	-$1,998,599
2	-	-	-	$54,387	-	$68,750	$166,128	$289,265	-$1,709,335
3	-	-	-	$54,092	-	$68,750	$168,974	$291,816	-$1,417,518
4	-	-	-	$53,797	-	$68,750	$171,842	$294,389	-$1,123,130
5	-	-	-	$53,501	-	$68,750	$174,730	$296,981	-$826,148
6	-	-	-	$53,206	-	$68,750	$177,637	$299,593	-$526,555
7	-	-	-	$52,911	-	$68,750	$180,560	$302,221	-$224,334
8	-	-	-	$52,615	-	$68,750	$183,500	$304,865	$80,531
9	-	-	-	$52,320	-	$68,750	$186,453	$307,523	$388,054
10	-	-	-	$52,025	-	$68,750	$189,418	$310,193	$698,247
11	-	-	-	$51,730	-	-	$192,393	$244,123	$942,369
12	-	-$5,000	-	$51,434	-	-	$195,376	$241,811	$1,184,180
13	-	-	-	$51,139	-	-	$198,366	$249,505	$1,433,685
14	-	-	-	$50,844	-	-	$201,358	$252,202	$1,685,886
15	-	-	-	$50,548	-	-	$204,352	$254,900	$1,940,787
16	-	-	-	$50,253	-	-	$239,624	$289,877	$2,230,663
17	-	-	-	$49,958	-	-	$243,580	$293,538	$2,524,201
18	-	-	-	$49,663	-	-	$247,558	$297,220	$2,821,421
19	-	-	-	$49,367	-	-	$251,555	$300,922	$3,122,343
20	-	-	-	$49,072	-	-	$255,569	$304,641	$3,426,984
21	-	-	-	-	-	-	$259,598	$259,598	$3,686,582
22	-	-	-	-	-	-	$263,638	$263,638	$3,950,220
23	-	-	-	-	-	-	$267,687	$267,687	$4,217,907
24	-	-	-	-	-	-	$271,742	$271,742	$4,489,649
25	-	-	-	-	-	-	$275,799	$275,799	$4,765,448
Totals:	-$3,007,020	-$5,000	$457,685	$1,037,544	$264,000	$687,500	$5,330,740	$4,765,448	-

State and Federal income tax rates, as well as the discount rate, were left at their default values for this financial model. A more accurate model can be produced if the customer provides actual tax rates and desired discount rate.

2.2 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	11.4%	Net Present Value	$1,690,191	Payback Period	7.7 Years
ROI	158.5%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$3,007,020				

Years	Upfront	1	2	3	4	5	6	7	8	9	10	11
Cash												
Project Costs	-$3,007,020	-	-	-	-	-	-	-	-	-	-	-
Inverter Replacement	-	-	-	-	-	-	-	-	-	-	-	-
Direct pay - 24% ITC PV	-	$457,685	-	-	-	-	-	-	-	-	-	-
(SMART) Program - PV	-	$54,682	$54,387	$54,092	$53,797	$53,501	$53,206	$52,911	$52,615	$52,320	$52,025	$51,730
Direct Pay - 24% ITC BESS	-	$264,000	-	-	-	-	-	-	-	-	-	-
Incentive Amount	-	$68,750	$68,750	$68,750	$68,750	$68,750	$68,750	$68,750	$68,750	$68,750	$68,750	-
Electric Bill Savings	-	$163,304	$166,128	$168,974	$171,842	$174,730	$177,637	$180,560	$183,500	$186,453	$189,418	$192,393
Cash Total	-$3,007,020	$1,008,421	$289,265	$291,816	$294,389	$296,981	$299,593	$302,221	$304,865	$307,523	$310,193	$244,123
Total Cash Flow	-$3,007,020	$1,008,421	$289,265	$291,816	$294,389	$296,981	$299,593	$302,221	$304,865	$307,523	$310,193	$244,123
Cumulative Cash Flow	-$3,007,020	-$1,998,599	-$1,709,335	-$1,417,518	-$1,123,130	-$826,148	-$526,555	-$224,334	$80,531	$388,054	$698,247	$942,369

2.2 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	11.4%	Net Present Value	$1,690,191	Payback Period	7.7 Years
ROI	158.5%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$3,007,020				

Years	12	13	14	15	16	17	18	19	20	21	22
Cash											
Project Costs	-	-	-	-	-	-	-	-	-	-	-
Inverter Replacement	-$5,000	-	-	-	-	-	-	-	-	-	-
Direct pay - 24% ITC PV	-	-	-	-	-	-	-	-	-	-	-
(SMART) Program - PV	$51,434	$51,139	$50,844	$50,548	$50,253	$49,958	$49,663	$49,367	$49,072	-	-
Direct Pay - 24% ITC BESS	-	-	-	-	-	-	-	-	-	-	-
Incentive Amount	-	-	-	-	-	-	-	-	-	-	-
Electric Bill Savings	$195,376	$198,366	$201,358	$204,352	$239,624	$243,580	$247,558	$251,555	$255,569	$259,598	$263,638
Cash Total	$241,811	$249,505	$252,202	$254,900	$289,877	$293,538	$297,220	$300,922	$304,641	$259,598	$263,638
Total Cash Flow	$241,811	$249,505	$252,202	$254,900	$289,877	$293,538	$297,220	$300,922	$304,641	$259,598	$263,638
Cumulative Cash Flow	$1,184,180	$1,433,685	$1,685,886	$1,940,787	$2,230,663	$2,524,201	$2,821,421	$3,122,343	$3,426,984	$3,686,582	$3,950,220

2.2 Cash Purchase

Assumptions and Key Financial Metrics

IRR - Term	11.4%	Net Present Value	$1,690,191	Payback Period	7.7 Years
ROI	158.5%	PV Degradation Rate	0.54%	Discount Rate	5.0%
Energy Cost Escalation Rate	3.0%	Federal Income Tax Rate	0.0%	State Income Tax Rate	0.0%
Total Project Costs	$3,007,020				

Years	23	24	25	Totals
Cash				
Project Costs	-	-	-	-$3,007,020
Inverter Replacement	-	-	-	-$5,000
Direct pay - 24% ITC PV	-	-	-	$457,685
(SMART) Program - PV	-	-	-	$1,037,544
Direct Pay - 24% ITC BESS	-	-	-	$264,000
Incentive Amount	-	-	-	$687,500
Electric Bill Savings	$267,687	$271,742	$275,799	$5,330,740
Cash Total	$267,687	$271,742	$275,799	$4,765,448
Total Cash Flow	$267,687	$271,742	$275,799	$4,765,448
Cumulative Cash Flow	$4,217,907	$4,489,649	$4,765,448	-

Qcells 485 - Rooftop & Canopy DiNisco - Fox Hill ES, Fox Hill Rd, Burlington, MA

Report

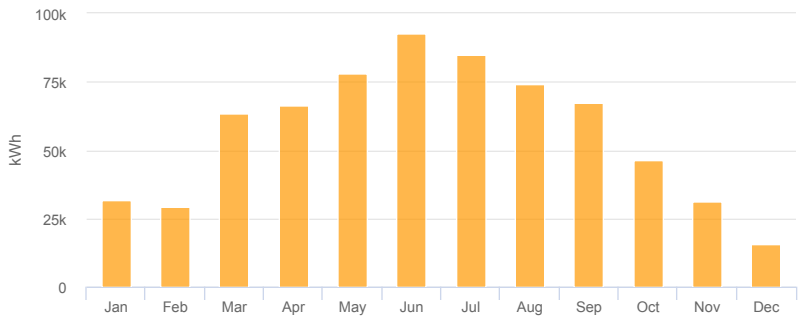
Project Name	DiNisco - Fox Hill ES
Project Address	Fox Hill Rd, Burlington, MA
Prepared By	Solar Design Associates nlawrence@solardesign.com

System Metrics

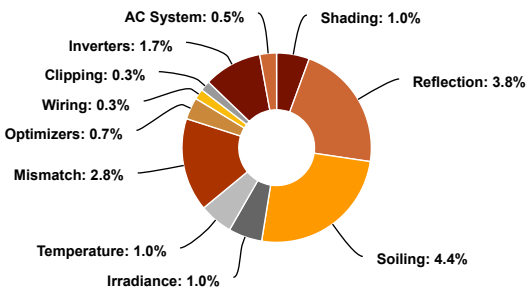
Design	Qcells 485 - Rooftop & Canopy
Module DC Nameplate	620.8 kW
Inverter AC Nameplate	490.0 kW Load Ratio: 1.27
Annual Production	681.6 MWh
Performance Ratio	83.8%
kWh/kWp	1,097.9
Weather Dataset	TMY, LAWRENCE MUNI, NSRDB (tmy3, II)
Simulator Version	3b0039aa8f-9ea9f74c78-536838c0ea-9d47c8cc7e

Project Location

Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,266.9	
	POA Irradiance	1,310.3	3.4%
	Shaded Irradiance	1,297.5	-1.0%
	Irradiance after Reflection	1,248.3	-3.8%
	Irradiance after Soiling	1,193.3	-4.4%
	Total Collector Irradiance	**1,193.3**	**0.0%**
Energy (kWh)	Nameplate	740,920.3	
	Output at Irradiance Levels	733,506.5	-1.0%
	Output at Cell Temperature Derate	726,169.6	-1.0%
	Output After Mismatch	705,967.2	-2.8%
	Optimizer Output	323,085.5	-0.7%
	Optimal DC Output	699,193.4	-0.3%
	Constrained DC Output	697,086.0	-0.3%
	Inverter Output	684,991.1	-1.7%
	Energy to Grid	**681,566.1**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp		13.3 °C
	Avg. Operating Cell Temp		19.6 °C
Simulation Metrics			
	Operating Hours		4435
	Solved Hours		4435

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, LAWRENCE MUNI, NSRDB (tmy3, II)
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
15	20	10	5	2	1.5	1	1	1	2	3	10

Irradiation Variance	5%
Cell Temperature Spread	4° C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Module Characterizations

Module	Uploaded By	Characterization
Q.Peak DUO XL-G10.3/BFG 485 (Hanwha Q Cells)	HelioScope	Spec Sheet Characterization, PAN

Component Characterizations

Device	Uploaded By	Characterization
Sunny Highpower PEAK3 125-US (SMA)	HelioScope	Spec Sheet
SE120K (480V) (SolarEdge)	HelioScope	Spec Sheet
P1101 (SolarEdge)	HelioScope	Mfg Spec Sheet

Components

Component	Name	Count
Inverters	Sunny Highpower PEAK3 125-US (SMA)	2 (250.0 kW)
Inverters	SE120K (480V) (SolarEdge)	2 (240.0 kW)
Strings	10 AWG (Copper)	53 (9,871.2 ft)
Optimizers	P1101 (SolarEdge)	284 (312.4 kW)
Module	Hanwha Q Cells, Q.Peak DUO XL-G10.3/BFG 485 (485W)	1,280 (620.8 kW)

Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	13-25	Along Racking
Wiring Zone 2	-	16-25	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 2	Fixed Tilt	Landscape (Horizontal)	Module: 15°	Module: 180°	1.6 ft	1x1			0
Field Segment 3	Fixed Tilt	Landscape (Horizontal)	Module: 10°	Module: 209.60983°	1.2 ft	1x1	140	140	67.9 kW
Field Segment 4	Fixed Tilt	Landscape (Horizontal)	Module: 15°	Module: 180°	1.6 ft	1x1			0
Field Segment 4	Fixed Tilt	Landscape (Horizontal)	Module: 10°	Module: 194.77954°	1.2 ft	1x1	338	338	163.9 kW
Field Segment 5	Fixed Tilt	Landscape (Horizontal)	Module: 10°	Module: 209.64612°	1.2 ft	1x1	82	82	39.8 kW
Field Segment 6	Fixed Tilt	Landscape (Horizontal)	Module: 15°	Module: 209.64612°	1.6 ft	1x1			0
Field Segment 7	Carport	Portrait (Vertical)	7°	118.54213°	0.0 ft	1x1	200	200	97.0 kW
Field Segment 7 (copy)	Carport	Portrait (Vertical)	3°	298.57645°	0.0 ft	1x1	200	200	97.0 kW
Field Segment 7 (copy 1)	Carport	Portrait (Vertical)	7°	118.4968°	0.0 ft	1x1	160	160	77.6 kW
Field Segment 7 (copy 2)	Carport	Portrait (Vertical)	7°	298.71454°	0.0 ft	1x1	160	160	77.6 kW

Detailed Layout