

ENERGY TOOLBASE™

Prepared For
Town of Cape Elizabeth
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The Energy Toolbase provides comprehensive cost analysis for commercial, municipal, and residential renewable energy projects. We provide the tools that professionals need to compete in the fast paced renewable energy market by leveraging our first hand experience developing energy projects. Our software developers are NABCEP certified energy professionals and have completed energy analysis for companies including the Mirage Casino Resorts, Boston Scientific, Leviton, Balfour Beatty Construction, and many others.

Cape Elizabeth Interval

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7/3/2019

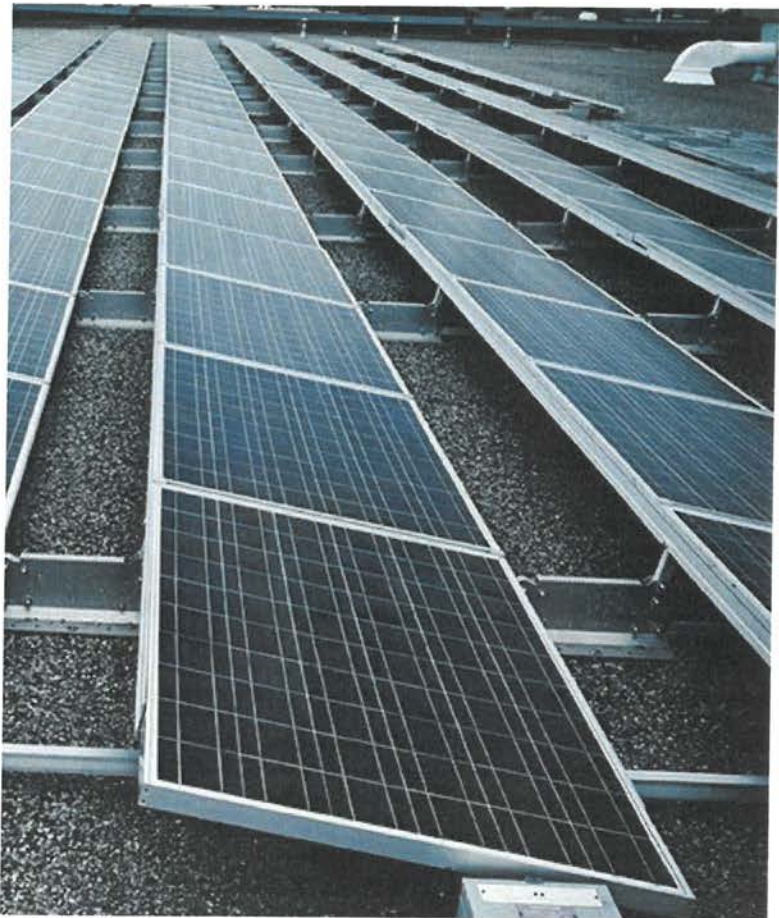


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4.1 Cash Purchase	24

1 Project Summary

Payment Options	Cash Purchase
Upfront Payment	\$3,000,000
Total Payments	\$3,000,000
Rebates and Incentives	\$5,891,971
Net Payments	(\$2,891,971)
30-Year Electric Bill Savings	\$4,741,036
30-Year IRR	13.77%
30-Year LCOE PV	-\$0.053
30-Year NPV	\$2,985,561
Payback Period	6.9 Years

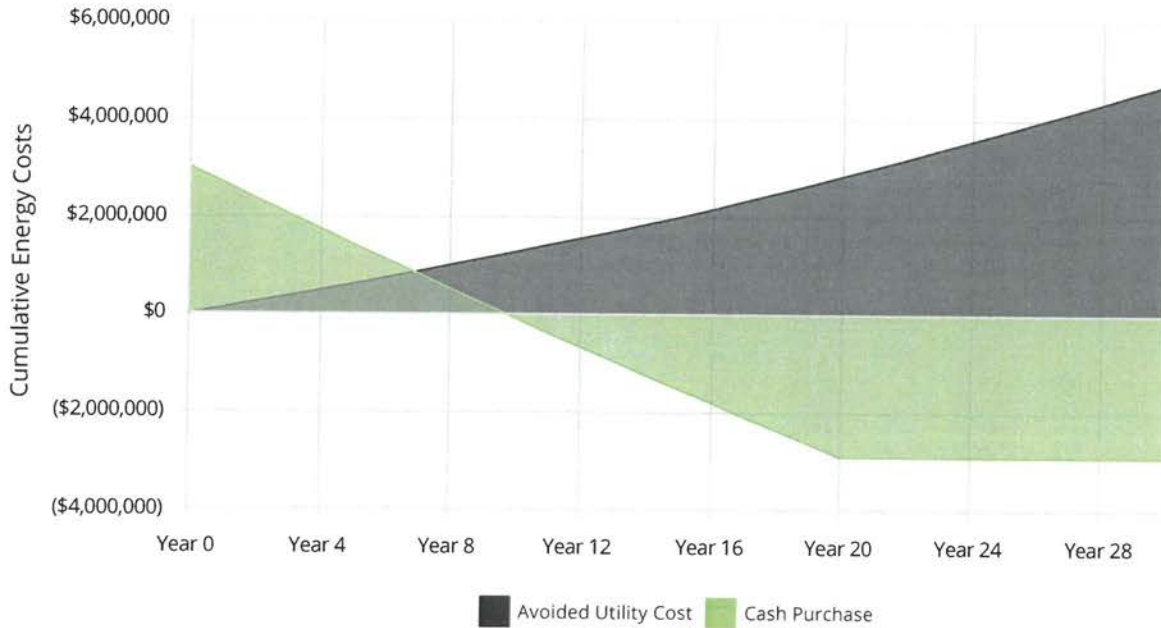
Combined Solar PV Rating

Power Rating: 1,128,238 W-DC
 Power Rating: 1,007,934 W-AC-CEC

Combined ESS Ratings

Energy Capacity: 1,000.0 kWh
 Power Rating: 250.0 kW

Cumulative Energy Costs By Payment Option



2.1.1 PV System Details

General Information

Facility: Facility #1
 Address: 320 Ocean House Rd Cape Elizabeth ME 04107

Solar PV Equipment Description

Solar Panels: 1,128.2kW-DC Premium Modules
 Inverters: Standard Inverter

Solar PV Equipment Typical Lifespan

Solar Panels: Greater than 30 Years
 Inverters: 15 Years

Solar PV System Cost And Incentives

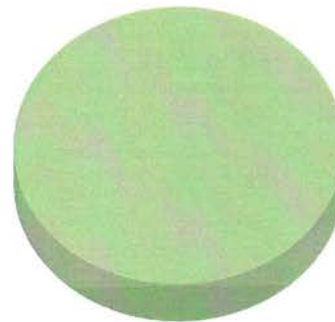
Solar PV System Cost	\$2,550,000
PV Incentive	-\$5,891,971
Net Solar PV System Cost:	-\$3,341,971

Solar PV System Rating

Power Rating: 1,128,238 W-DC
 Power Rating: 1,007,934 W-AC-CEC

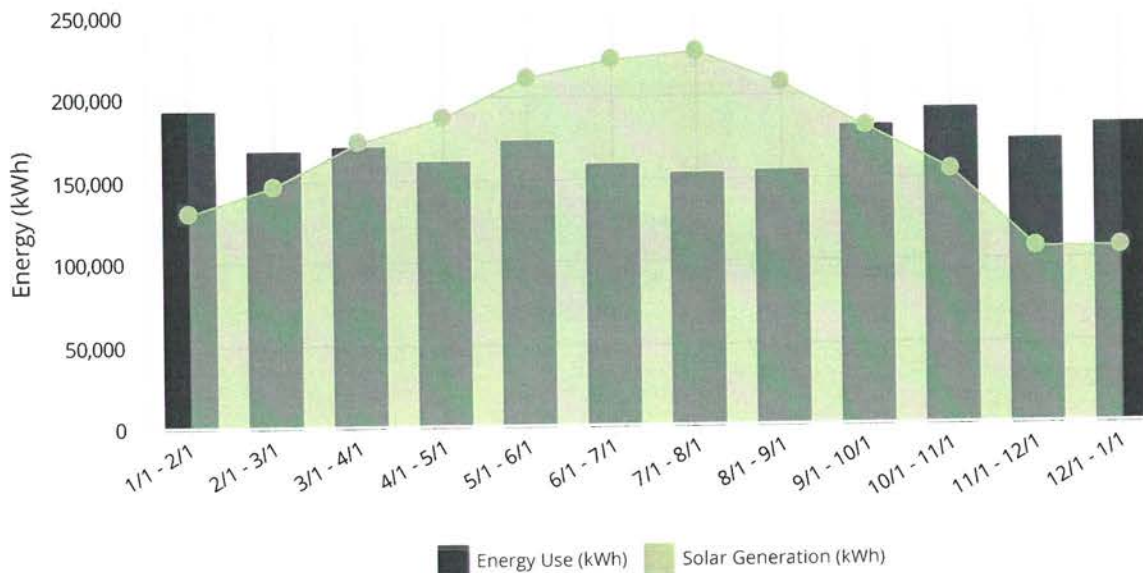
Energy Consumption Mix

Annual Energy Use: 2,056,968 kWh



Utility	3 kWh (0.00%)
Solar PV	2,056,965 kWh (100.00%)

Monthly Energy Use vs Solar Generation



2.1.2 Energy Storage System (ESS) Details

General Information

Facility: Facility #1
 Address: Cape Elizabeth ME 04107

ESS System Ratings

Energy Capacity: 1,000.0 kWh
 Power Rating: 250.0 kW

ESS Equipment Description

Battery: 250kw/1000kWh Energy Storage
 Banks: System
 Inverters: 250kw/1000kWh Energy Storage System

ESS Equipment Typical Lifespan

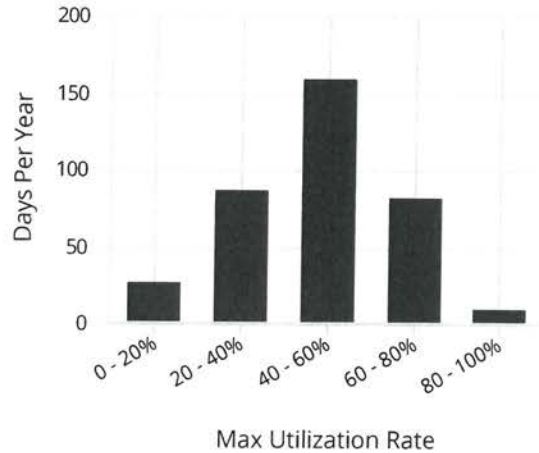
Battery Banks: 15 Years
 Inverters: 15 Years

ESS Cost And Incentives

ESS System Cost \$450,000

Net ESS System Cost: \$450,000

Energy Storage Annual Utilization



Energy Output and Demand Savings From Solar PV and Energy Storage

Date Range	ESS Energy Discharge	Solar PV Generation	ESS Energy as % of PV Energy	Total Demand Savings
1/1/2019 - 2/1/2019	9,454	130,283	7.26%	\$1,576
2/1/2019 - 3/1/2019	11,841	146,815	8.07%	\$2,574
3/1/2018 - 4/1/2018	10,456	172,947	6.05%	\$2,209
4/1/2018 - 5/1/2018	10,673	188,103	5.67%	\$2,702
5/1/2018 - 6/1/2018	12,280	212,030	5.79%	\$3,732
6/1/2018 - 7/1/2018	11,736	222,636	5.27%	\$3,057
7/1/2018 - 8/1/2018	15,245	227,466	6.70%	\$2,571
8/1/2018 - 9/1/2018	12,573	207,814	6.05%	\$2,814
9/1/2018 - 10/1/2018	12,288	180,821	6.80%	\$2,992
10/1/2018 - 11/1/2018	11,101	154,425	7.19%	\$2,152
11/1/2018 - 12/1/2018	9,131	106,616	8.56%	\$2,095
12/1/2018 - 1/1/2019	8,790	107,009	8.21%	\$1,814
-	135,568	2,056,965	6.59%	\$30,288

2.1.3 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.

Maine Sample Incentive

Performance Based PV Incentive, priced at \$0.05/kWh for a 20-year term.

Total Incentive Value: \$5,891,971

2.1.4 Utility Rates

The table below shows the rates associated with your current utility rate schedule (IGS-S-TOU). Your estimated electric bills after solar are shown on the following page.

Fixed Charges		Energy Charges		Demand Charges	
Type	IGS-S-TOU	Type	IGS-S-TOU	Type	IGS-S-TOU
S1 Monthly	\$111.48	S1 On Peak	\$0.04388	S1 On Peak	\$13.33
S2 Monthly	\$111.48	S1 Shoulder	\$0.04388	S1 Shoulder	\$1.79
S3 Monthly	\$111.48	S1 Off Peak	\$0.04388	S2 On Peak	\$12.98
S4 Monthly	\$111.48	S2 On Peak	\$0.04388	S2 Shoulder	\$1.44
		S2 Shoulder	\$0.04388	S3 On Peak	\$12.98
		S2 Off Peak	\$0.04388	S3 Shoulder	\$1.44
		S3 On Peak	\$0.04388	S4 On Peak	\$12.98
		S3 Shoulder	\$0.04388	S4 Shoulder	\$1.44
		S3 Off Peak	\$0.04388		
		S4 On Peak	\$0.04388		
		S4 Shoulder	\$0.04388		
		S4 Off Peak	\$0.04388		

2.1.5 Current Electric Bill

The table below shows your annual electricity costs based on the most current utility rates and your previous 12 months of electrical usage.

Rate Schedule: CMP - IGS-S-TOU

Time Periods	Energy Use (kWh)			Max Demand (kW)		Charges			
	On Peak	Shoulder	Off Peak	On Peak	Shoulder	Other	Energy	Demand	Total
1/1/2019 - 2/1/2019 S3	71,610	49,451	71,447	451	454	\$111	\$8,448	\$6,508	\$15,067
2/1/2019 - 3/1/2019 S3	60,619	43,490	63,641	460	459	\$111	\$7,361	\$6,632	\$14,104
3/1/2018 - 4/1/2018 S3	63,012	44,081	62,918	445	447	\$111	\$7,460	\$6,420	\$13,992
4/1/2018 - 5/1/2018 S4	61,722	27,433	71,680	470	444	\$111	\$7,058	\$6,740	\$13,909
5/1/2018 - 6/1/2018 S4	71,952	32,072	69,010	494	462	\$111	\$7,593	\$7,077	\$14,782
6/1/2018 - 7/1/2018 S4	59,619	27,811	71,495	447	437	\$111	\$6,974	\$6,431	\$13,517
7/1/2018 - 8/1/2018 S1	54,845	26,958	71,597	346	341	\$111	\$6,731	\$5,223	\$12,066
8/1/2018 - 9/1/2018 S1	58,116	28,475	67,539	407	404	\$111	\$6,764	\$6,148	\$13,023
9/1/2018 - 10/1/2018 S2	68,814	30,464	81,821	491	476	\$111	\$7,947	\$7,059	\$15,117
10/1/2018 - 11/1/2018 S2	79,055	34,660	77,356	491	473	\$111	\$8,385	\$7,054	\$15,550
11/1/2018 - 12/1/2018 S2	66,225	30,998	75,579	466	459	\$111	\$7,583	\$6,710	\$14,404
12/1/2018 - 1/1/2019 S3	64,149	48,078	69,176	468	466	\$111	\$7,960	\$6,746	\$14,817
Totals:	779,738	423,971	853,259	-	-	\$1,338	\$90,264	\$78,747	\$170,349

2.1.6 New Electric Bill

Rate Schedule: CMP - IGS-S-TOU

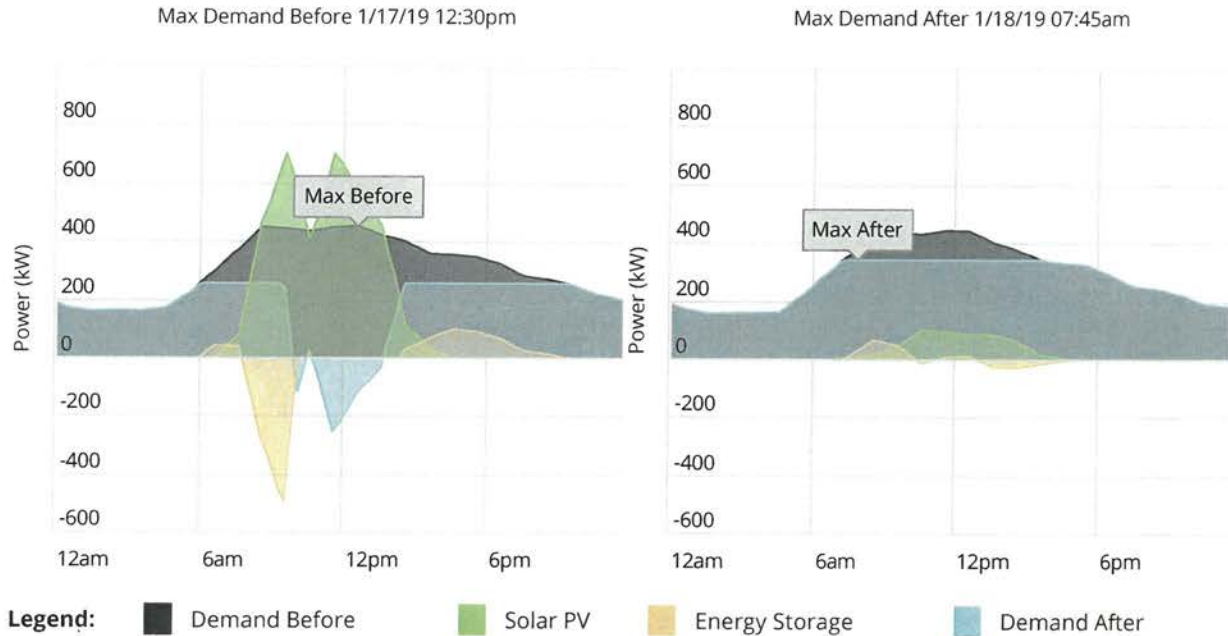
Time Periods	Energy Use (kWh)			Max Demand (kW)			Charges		
	On Peak	Shoulder	Off Peak	On Peak	Shoulder	Other	Energy	Demand	Total
Bill Ranges & Seasons									
1/1/2019 - 2/1/2019 S3	22,657	-10,887	54,086	342	342	\$111	\$2,890	\$4,932	\$7,933
2/1/2019 - 3/1/2019 S3	6,005	-22,455	42,034	282	276	\$111	\$1,123	\$4,058	\$5,292
3/1/2018 - 4/1/2018 S3	-3,168	-31,859	36,107	292	292	\$111	\$47	\$4,211	\$4,370
4/1/2018 - 5/1/2018 S4	-12,081	-16,400	5,311	280	280	\$111	-\$1,017	\$4,038	\$3,132
5/1/2018 - 6/1/2018 S4	-18,265	-22,291	6,274	232	232	\$111	-\$1,504	\$3,345	\$1,953
6/1/2018 - 7/1/2018 S4	-34,115	-24,966	133	234	234	\$111	-\$2,587	\$3,374	\$899
7/1/2018 - 8/1/2018 S1	-38,643	-34,802	5,232	182	126	\$111	-\$2,993	\$2,652	-\$230
8/1/2018 - 9/1/2018 S1	-25,663	-33,386	10,527	228	165	\$111	-\$2,129	\$3,335	\$1,317
9/1/2018 - 10/1/2018 S2	1,631	-16,949	20,504	282	282	\$111	\$228	\$4,066	\$4,405
10/1/2018 - 11/1/2018 S2	22,987	-9,721	27,644	340	340	\$111	\$1,795	\$4,903	\$6,809
11/1/2018 - 12/1/2018 S2	23,790	-2,421	48,255	320	320	\$111	\$3,055	\$4,614	\$7,781
12/1/2018 - 1/1/2019 S3	19,964	2,471	55,829	342	342	\$111	\$3,434	\$4,932	\$8,478
Totals:	-34,901	-223,666	311,936	-	-	\$1,338	\$2,342	\$48,459	\$52,139

Annual Electricity Savings: \$118,210

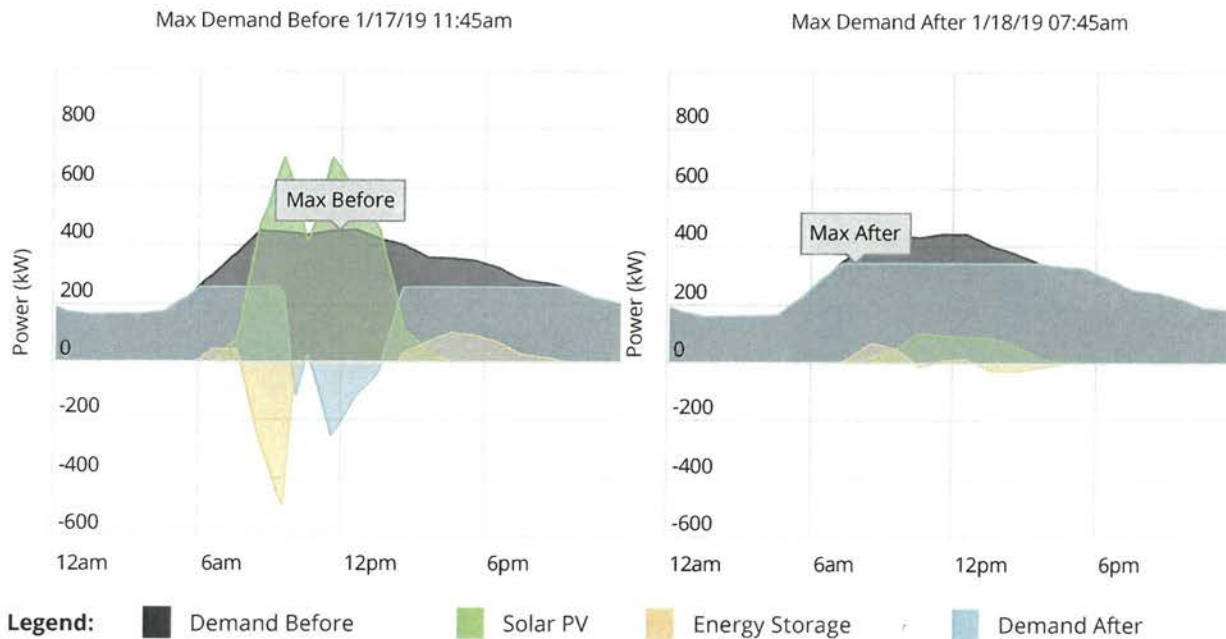
2.1.7 Demand Profiles

Date Range: 1/1/2019 - 2/1/2019

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



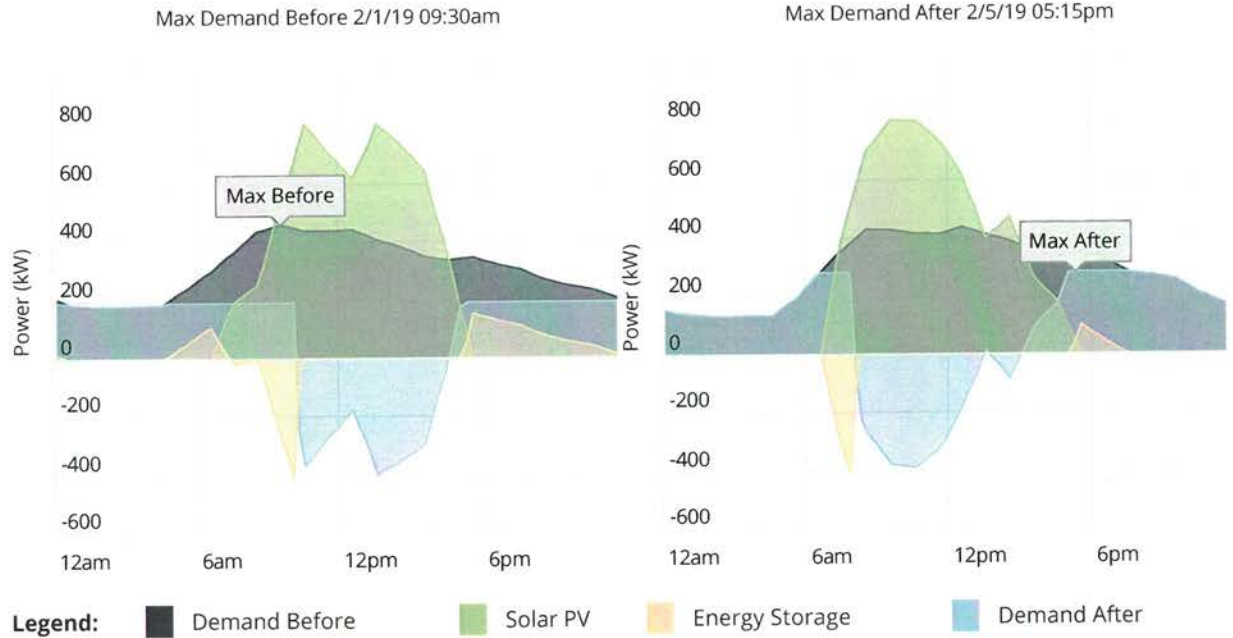
Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



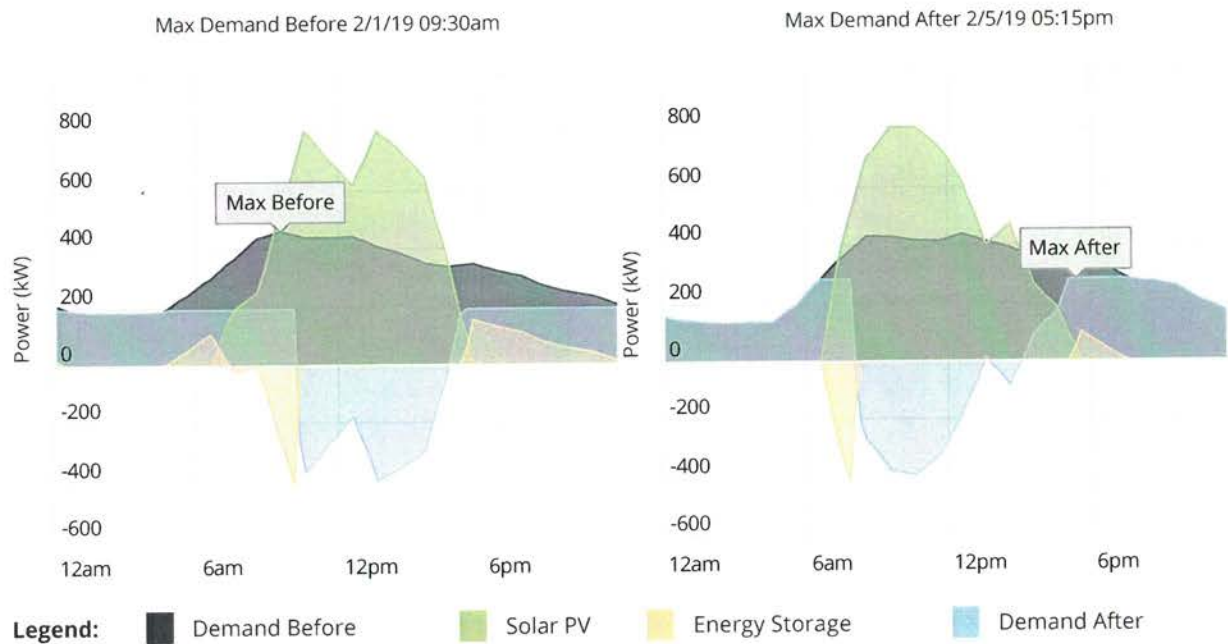
Demand Profiles

Date Range: 2/1/2019 - 3/1/2019

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



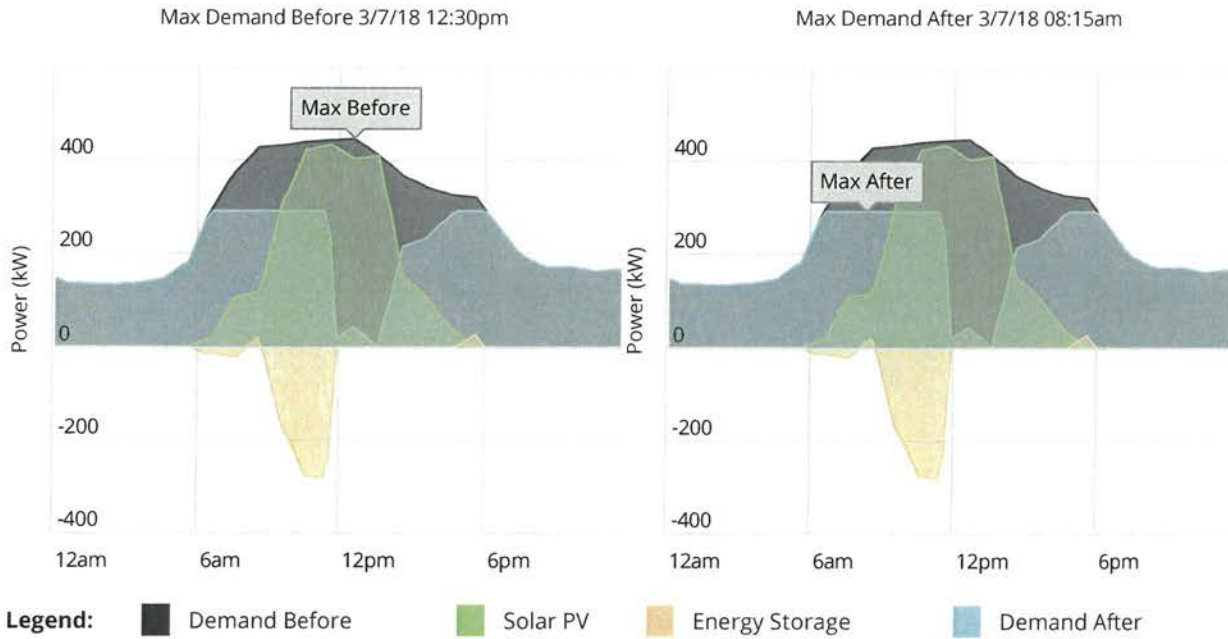
Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



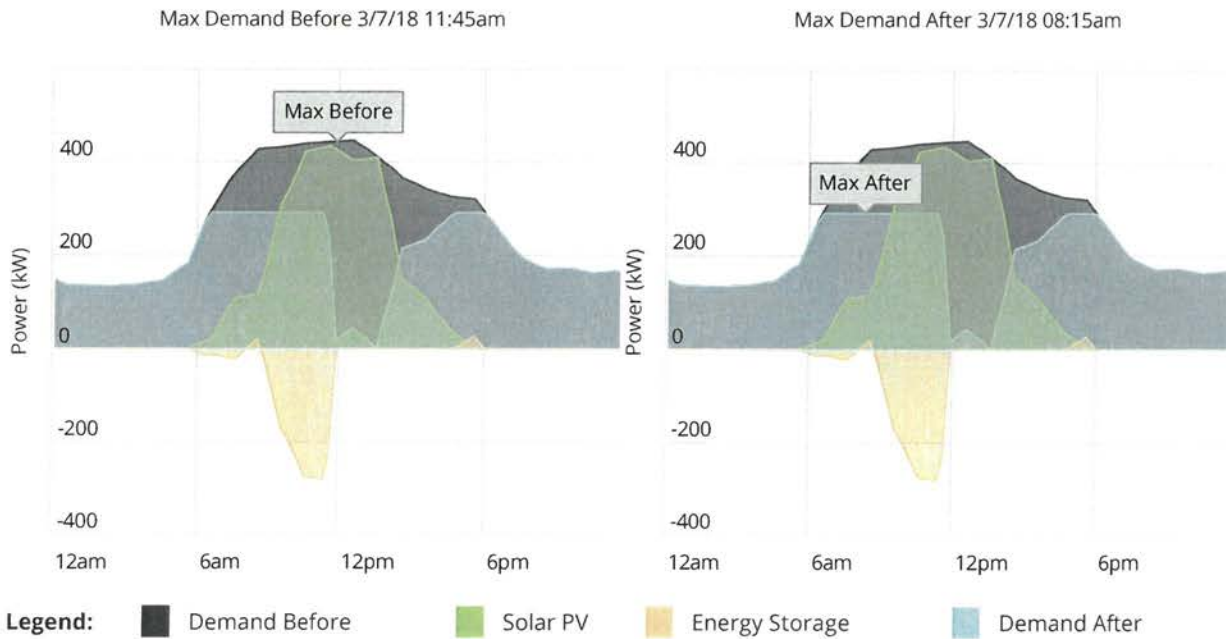
Demand Profiles

Date Range: 3/1/2018 - 4/1/2018

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



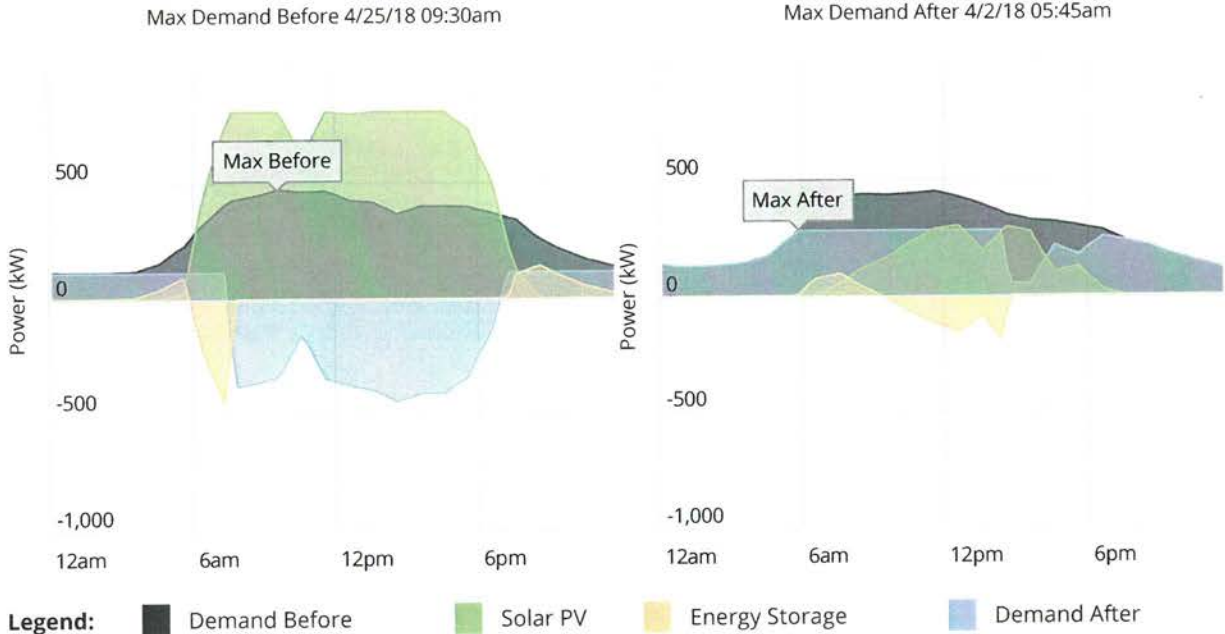
Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



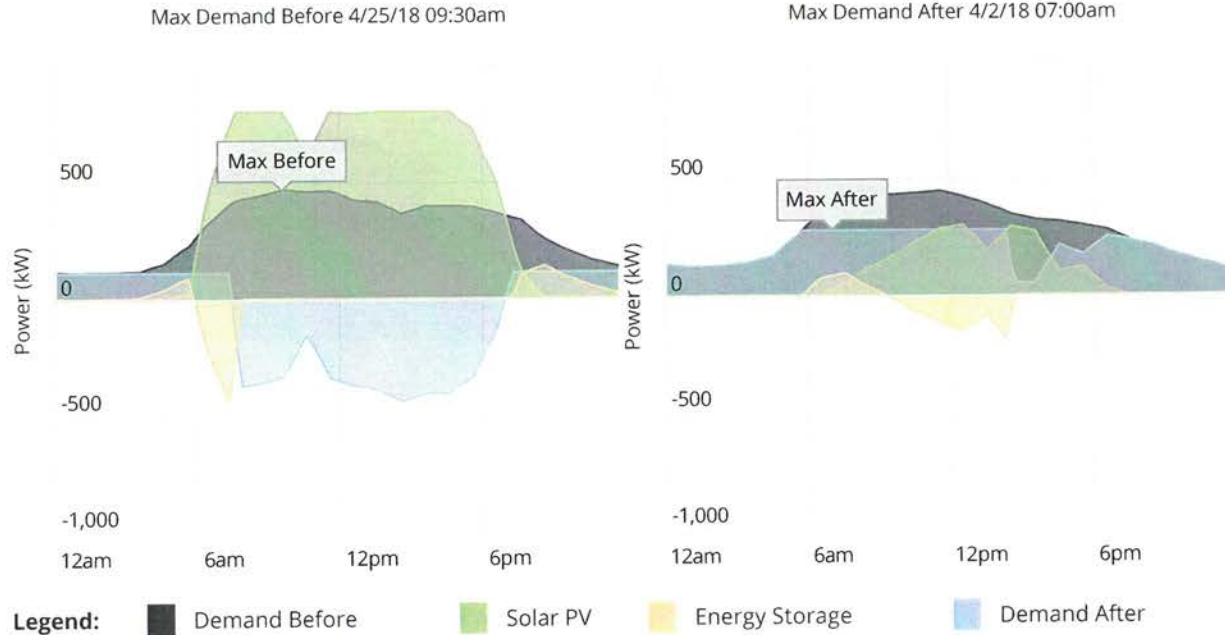
Demand Profiles

Date Range: 4/1/2018 - 5/1/2018

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



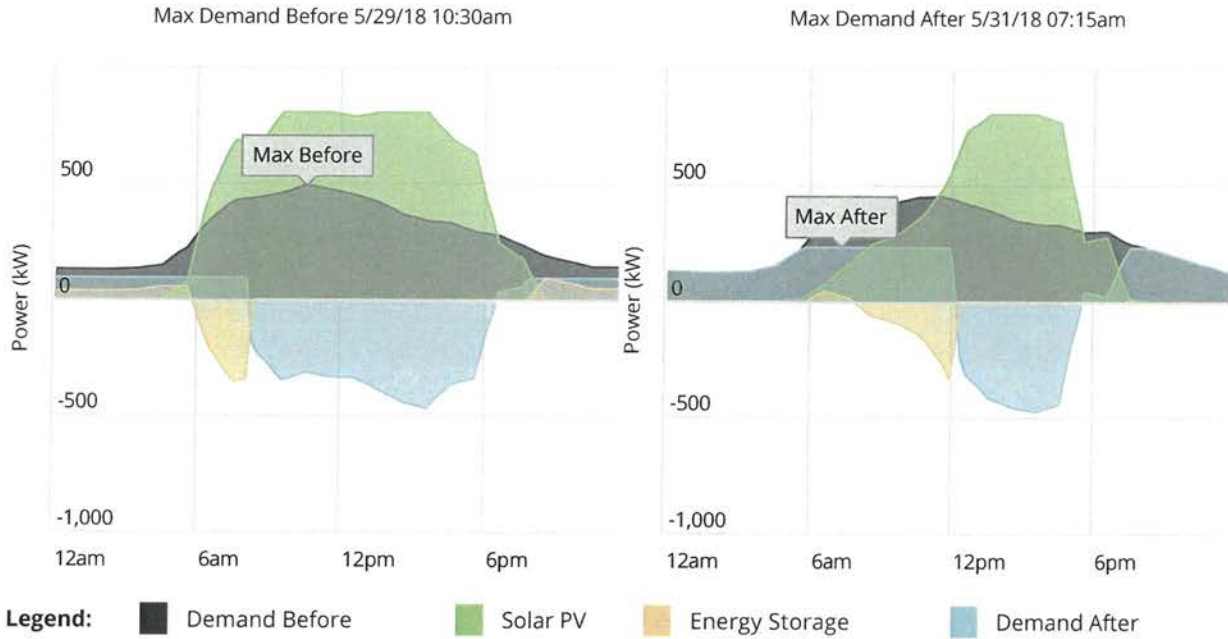
Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



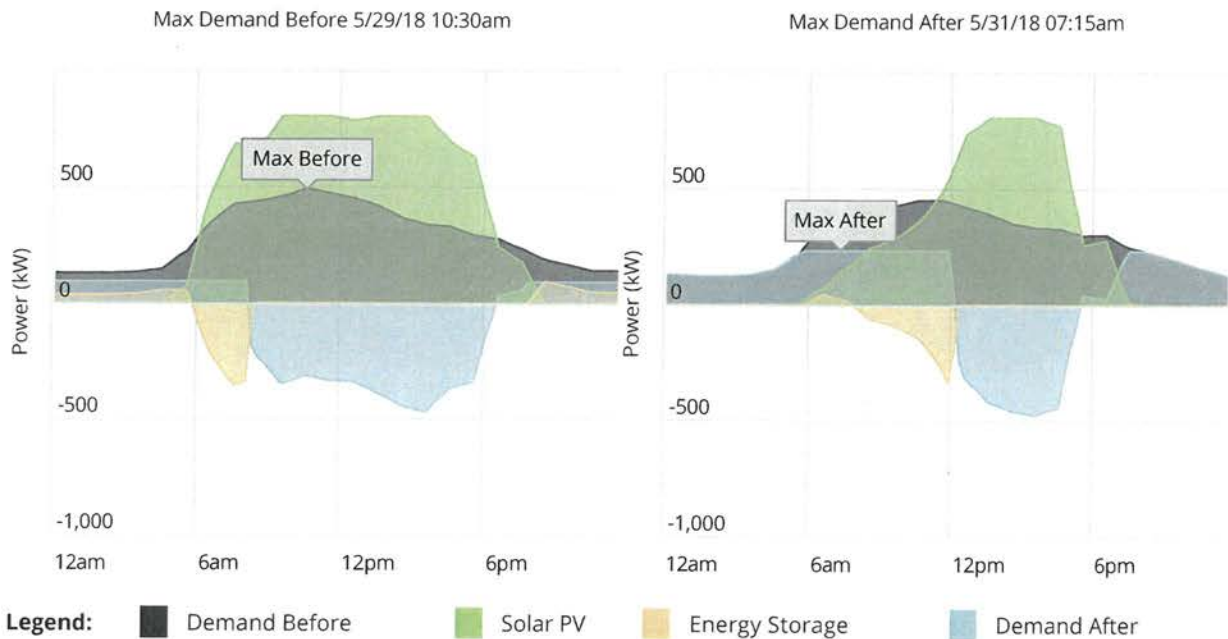
Demand Profiles

Date Range: 5/1/2018 - 6/1/2018

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



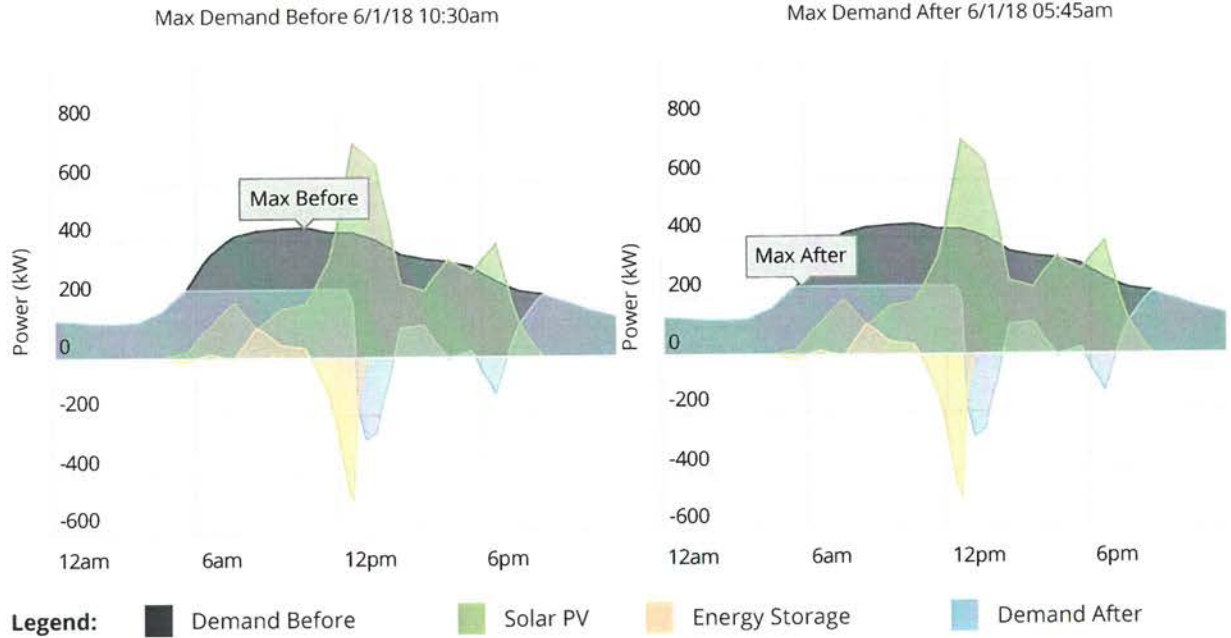
Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



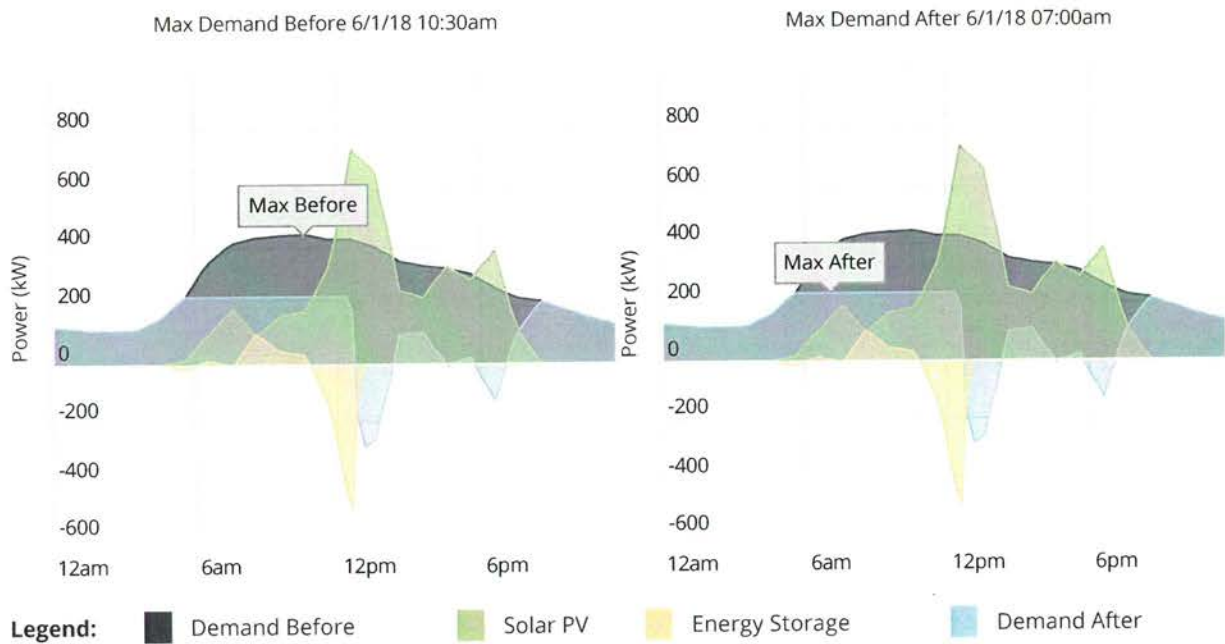
Demand Profiles

Date Range: 6/1/2018 - 7/1/2018

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



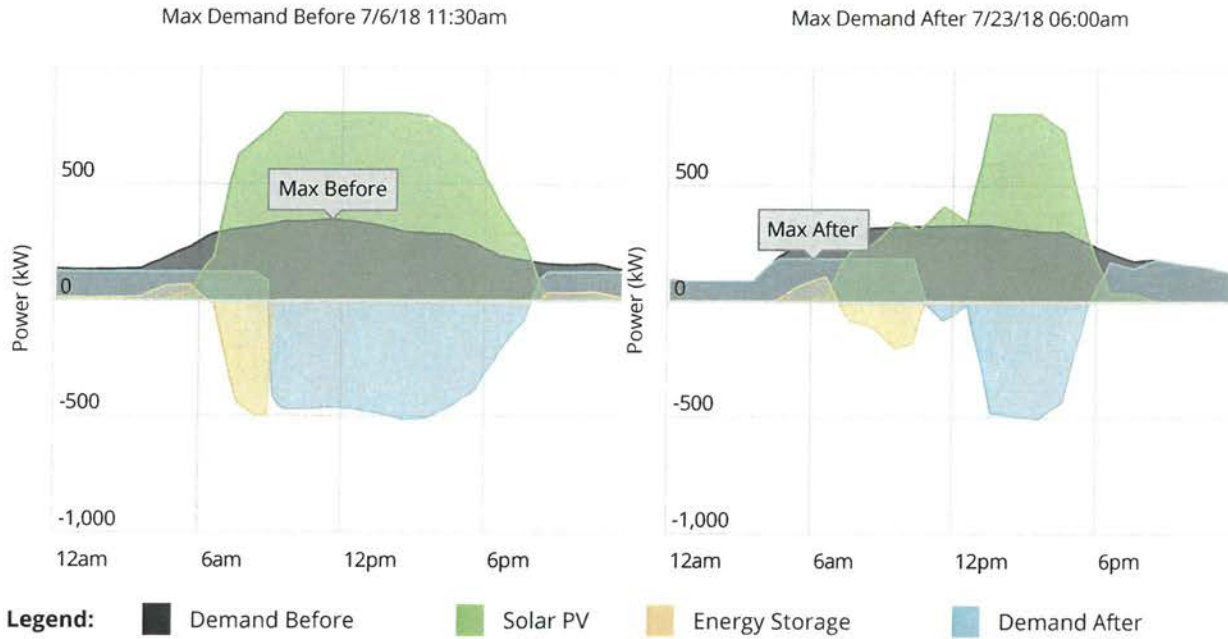
Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



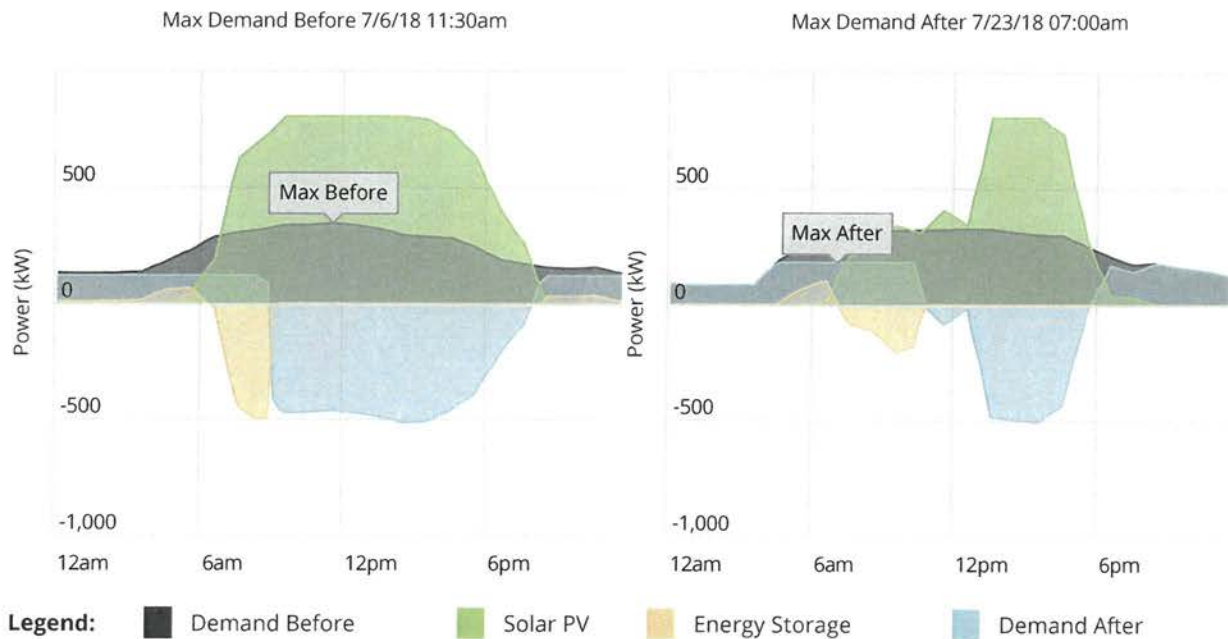
Demand Profiles

Date Range: 7/1/2018 - 8/1/2018

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



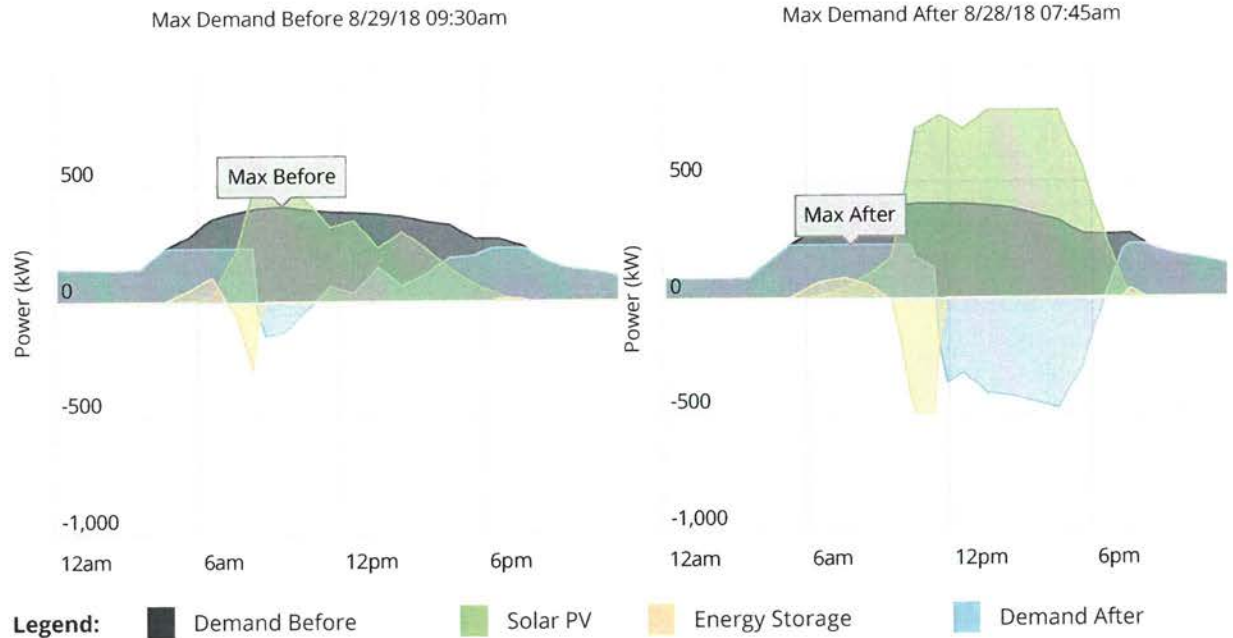
Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



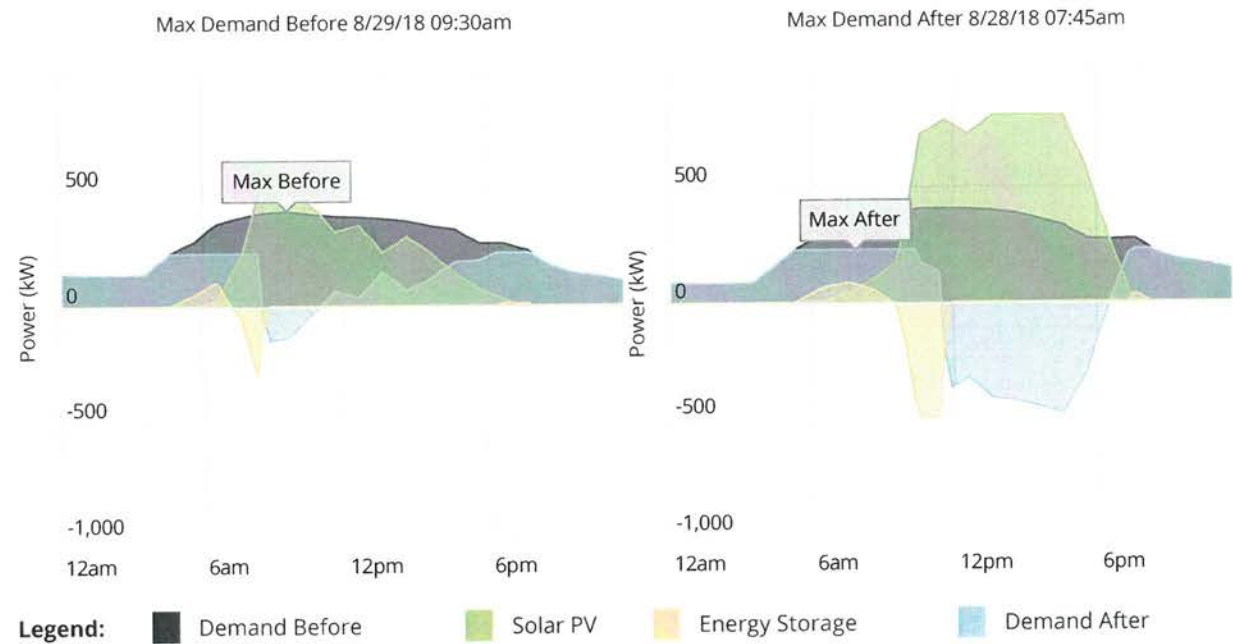
Demand Profiles

Date Range: 8/1/2018 - 9/1/2018

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



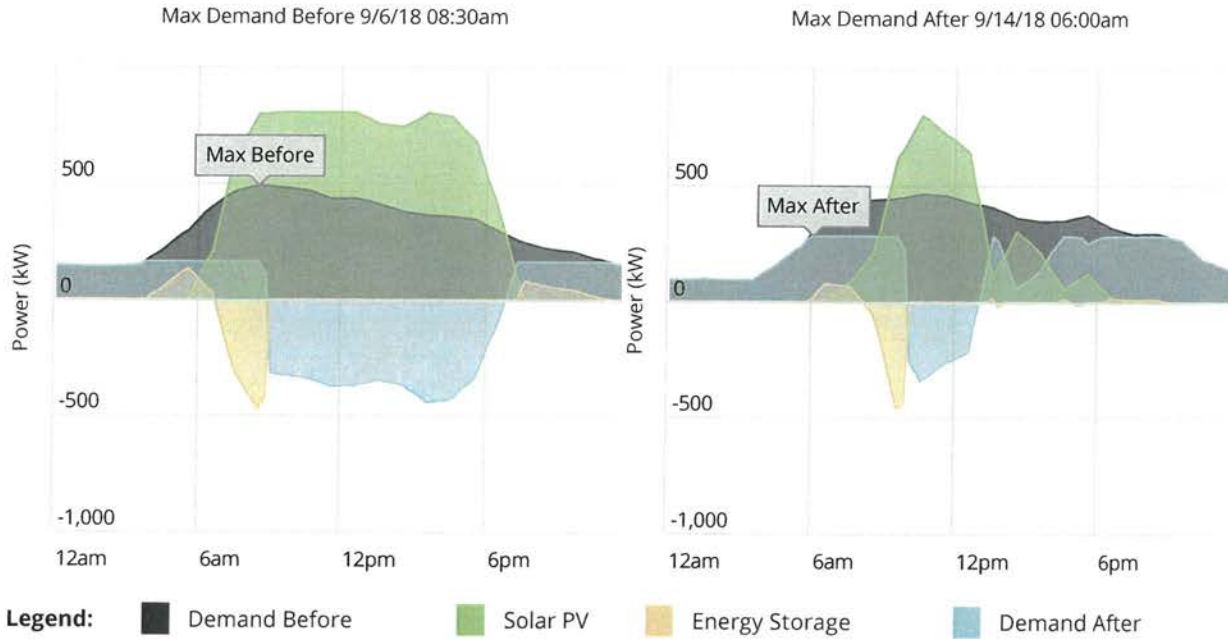
Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



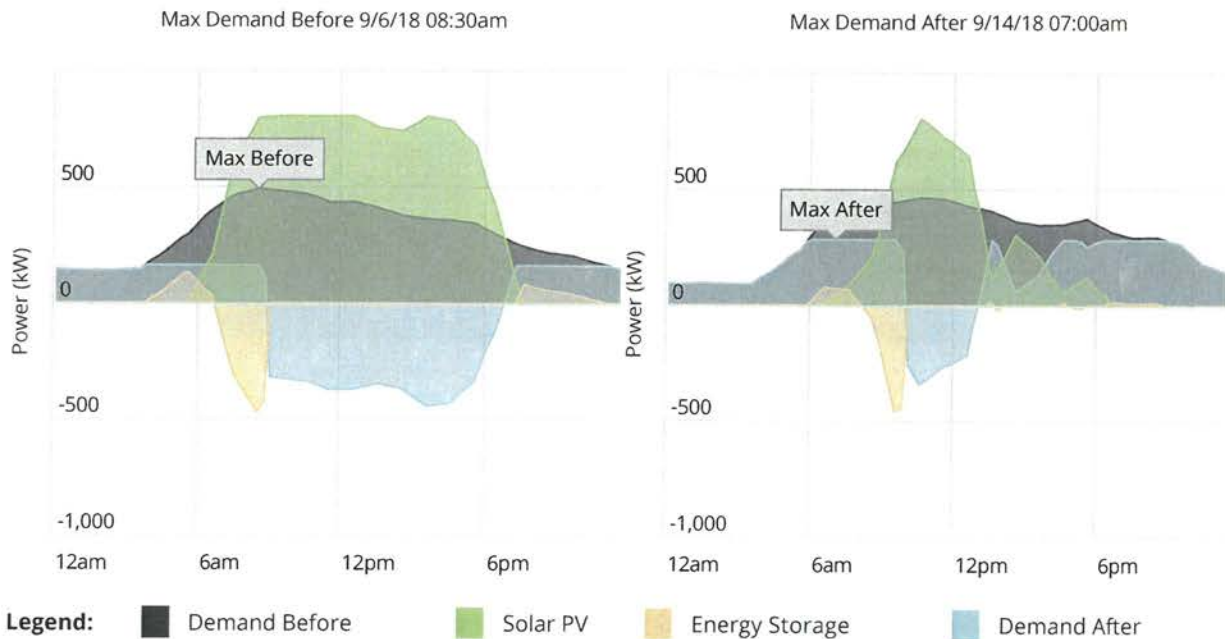
Demand Profiles

Date Range: 9/1/2018 - 10/1/2018

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



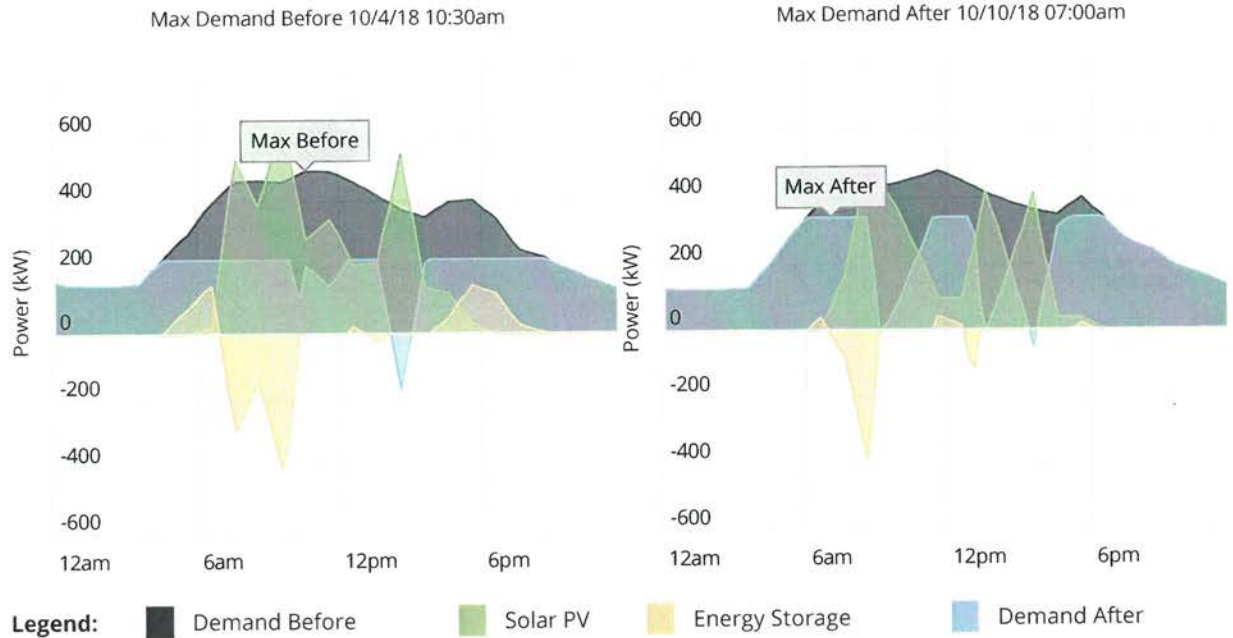
Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



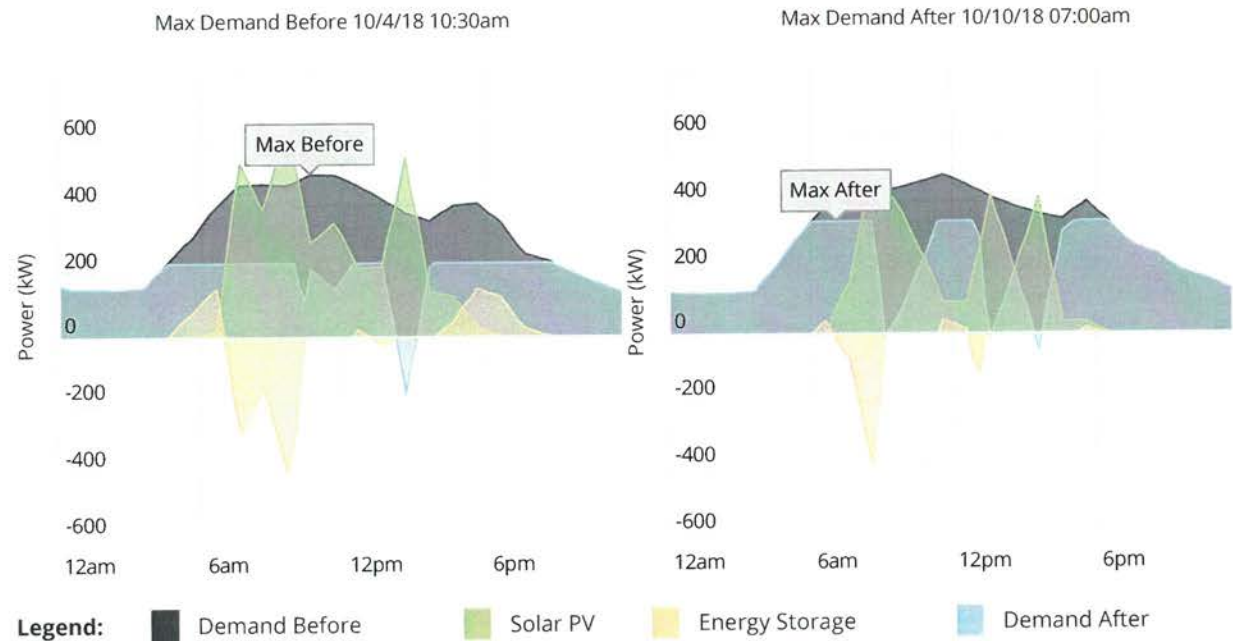
Demand Profiles

Date Range: 10/1/2018 - 11/1/2018

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



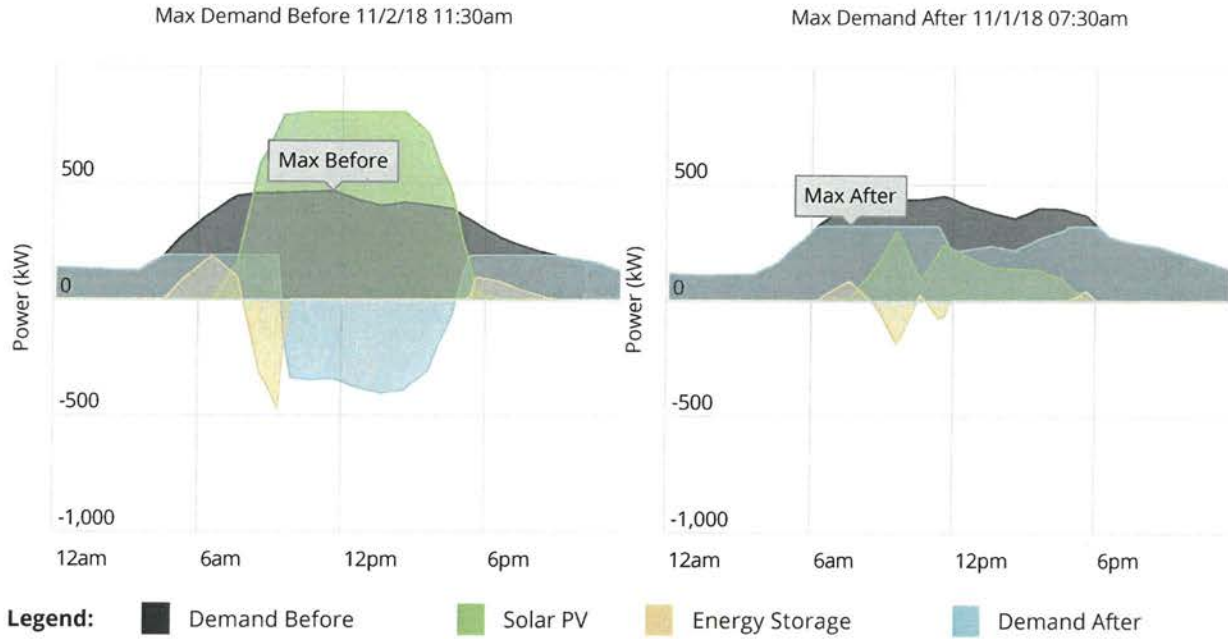
Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



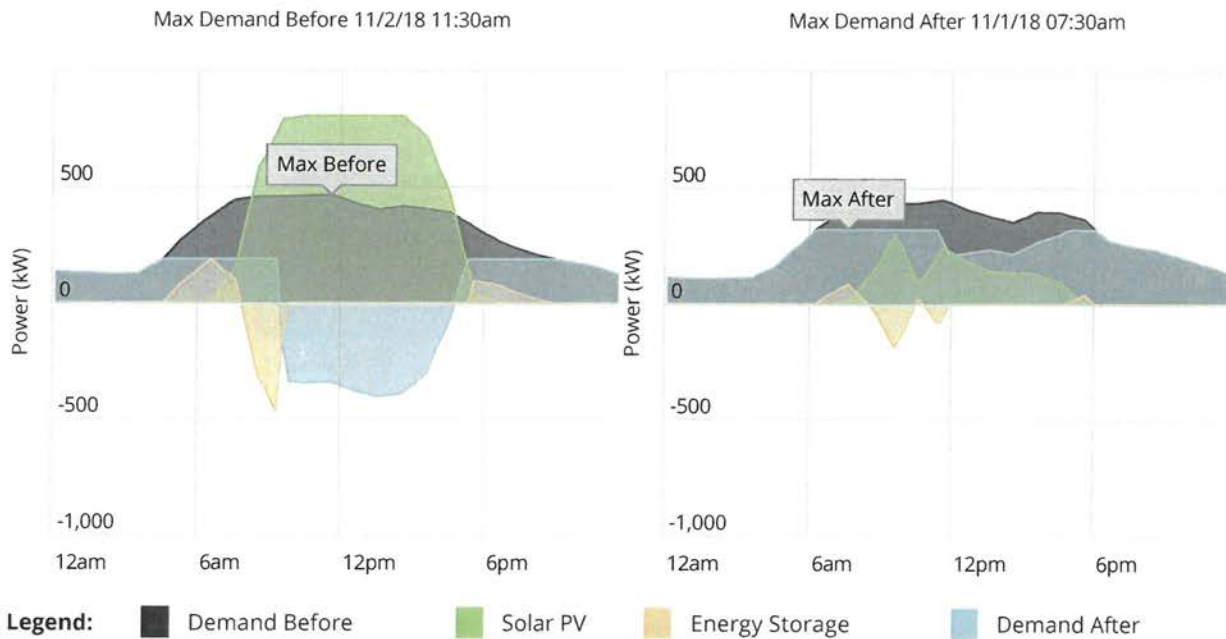
Demand Profiles

Date Range: 11/1/2018 - 12/1/2018

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



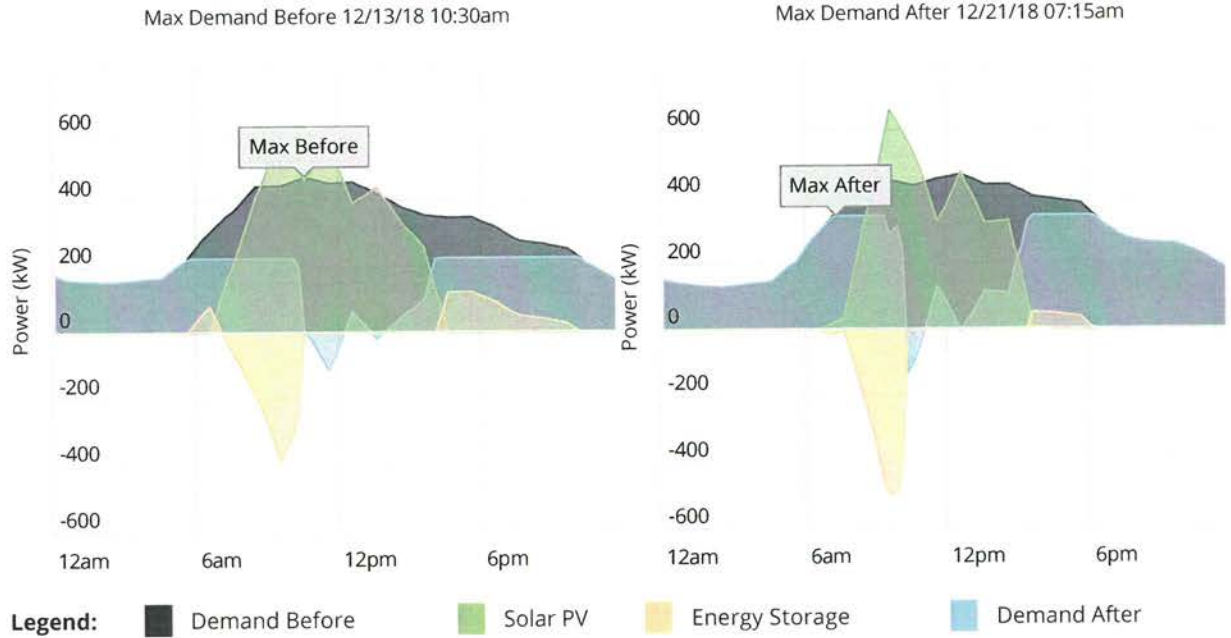
Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



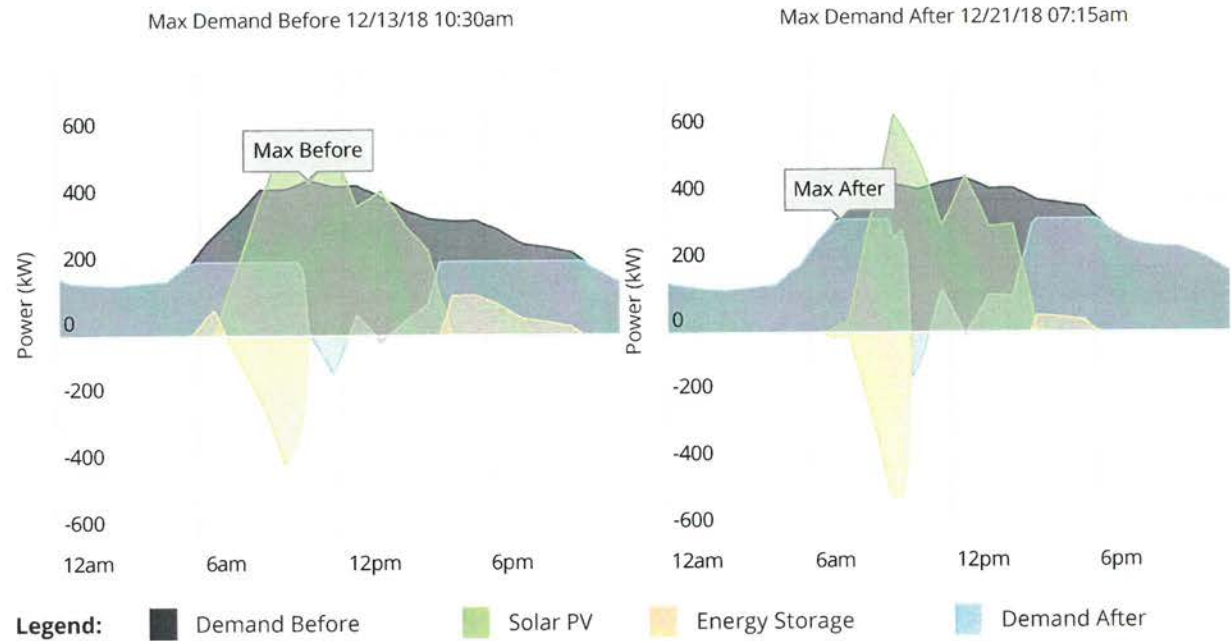
Demand Profiles

Date Range: 12/1/2018 - 1/1/2019

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.



3.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$3,000,000	30-Year ROI	254.4%	Electricity Escalation Rate	3%
30-Year IRR	13.77%	PV Degradation Rate	0.8%	Federal Income Tax Rate	0%
30-Year NPV	\$2,985,561	Discount Rate	5%	State Income Tax Rate	0%
Payback Period	6.9 Years				

Years	Project Costs	PV Incentive	Electric Bill Savings	Total Cash Flow	Cumulative Cash Flow
Upfront	-\$3,000,000	-	-	-\$3,000,000	-\$3,000,000
1	-	\$318,830	\$118,210	\$437,040	-\$2,562,960
2	-	\$316,279	\$120,290	\$436,569	-\$2,126,391
3	-	\$313,728	\$122,388	\$436,117	-\$1,690,274
4	-	\$311,178	\$124,504	\$435,682	-\$1,254,593
5	-	\$308,627	\$126,637	\$435,264	-\$819,329
6	-	\$306,076	\$128,785	\$434,862	-\$384,467
7	-	\$303,526	\$130,949	\$434,475	\$50,008
8	-	\$300,975	\$133,126	\$434,101	\$484,109
9	-	\$298,424	\$135,316	\$433,741	\$917,850
10	-	\$295,874	\$137,518	\$433,392	\$1,351,242
11	-	\$293,323	\$139,730	\$433,054	\$1,784,296
12	-	\$290,773	\$141,951	\$432,724	\$2,217,019
13	-	\$288,222	\$144,180	\$432,402	\$2,649,421
14	-	\$285,671	\$146,414	\$432,086	\$3,081,507
15	-	\$283,121	\$148,653	\$431,774	\$3,513,281
16	-	\$280,570	\$164,196	\$444,766	\$3,958,047
17	-	\$278,019	\$166,837	\$444,856	\$4,402,903
18	-	\$275,469	\$169,489	\$444,958	\$4,847,861
19	-	\$272,918	\$172,150	\$445,068	\$5,292,929
20	-	\$270,367	\$174,817	\$445,185	\$5,738,114
21	-	-	\$177,490	\$177,490	\$5,915,604
22	-	-	\$180,167	\$180,167	\$6,095,771
23	-	-	\$182,843	\$182,843	\$6,278,614
24	-	-	\$185,519	\$185,519	\$6,464,133
25	-	-	\$188,190	\$188,190	\$6,652,323
26	-	-	\$190,855	\$190,855	\$6,843,177
27	-	-	\$193,510	\$193,510	\$7,036,687
28	-	-	\$196,152	\$196,152	\$7,232,839
29	-	-	\$198,779	\$198,779	\$7,431,619
30	-	-	\$201,388	\$201,388	\$7,633,007
Totals:	-\$3,000,000	\$5,891,971	\$4,741,036	\$7,633,007	-

4.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$3,000,000	Payback Period	6.9 Years	Discount Rate	5%	State Income Tax Rate	0%
30-Year IRR	13.77%	30-Year ROI	254.4%	Electricity Escalation Rate	3%		
30-Year NPV	\$2,985,561	PV Degradation Rate	0.8%	Federal Income Tax Rate	0%		

Years	Upfront	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash											
Project Costs	-\$3,000,000	-	-	-	-	-	-	-	-	-	-
PV Incentive	-	\$318,830	\$316,279	\$313,728	\$311,178	\$308,627	\$306,076	\$303,526	\$300,975	\$298,424	\$295,874
Electric Bill Savings	-	\$118,210	\$120,290	\$122,388	\$124,504	\$126,637	\$128,785	\$130,949	\$133,126	\$135,316	\$137,518
Cash	-\$3,000,000	\$437,040	\$436,569	\$436,117	\$435,682	\$435,264	\$434,862	\$434,475	\$434,101	\$433,741	\$433,392
Total Cash Flow	-\$3,000,000	\$437,040	\$436,569	\$436,117	\$435,682	\$435,264	\$434,862	\$434,475	\$434,101	\$433,741	\$433,392
Cumulative Cash Flow	-\$3,000,000	-\$2,562,960	-\$2,126,391	-\$1,690,274	-\$1,254,593	-\$819,329	-\$384,467	\$50,008	\$484,109	\$917,850	\$1,351,242

4.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$3,000,000	Payback Period	6.9 Years	Discount Rate	5%	State Income Tax Rate	0%
30-Year IRR	13.77%	30-Year ROI	254.4%	Electricity Escalation Rate	3%		
30-Year NPV	\$2,985,561	PV Degradation Rate	0.8%	Federal Income Tax Rate	0%		

Years	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21
Cash											
Project Costs	-	-	-	-	-	-	-	-	-	-	-
PV Incentive	\$293,323	\$290,773	\$288,222	\$285,671	\$283,121	\$280,570	\$278,019	\$275,469	\$272,918	\$270,367	-
Electric Bill Savings	\$139,730	\$141,951	\$144,180	\$146,414	\$148,653	\$164,196	\$166,837	\$169,489	\$172,150	\$174,817	\$177,490
Cash	\$433,054	\$432,724	\$432,402	\$432,086	\$431,774	\$444,766	\$444,856	\$444,958	\$445,068	\$445,185	\$177,490
Total Cash Flow	\$433,054	\$432,724	\$432,402	\$432,086	\$431,774	\$444,766	\$444,856	\$444,958	\$445,068	\$445,185	\$177,490
Cumulative Cash Flow	\$1,784,296	\$2,217,019	\$2,649,421	\$3,081,507	\$3,513,281	\$3,958,047	\$4,402,903	\$4,847,861	\$5,292,929	\$5,738,114	\$5,915,604

4.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$3,000,000	Payback Period	6.9 Years	Discount Rate	5%	State Income Tax Rate	0%
30-Year IRR	13.77%	30-Year ROI	254.4%	Electricity Escalation Rate	3%		
30-Year NPV	\$2,985,561	PV Degradation Rate	0.8%	Federal Income Tax Rate	0%		

Years	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Totals
Cash										
Project Costs	-	-	-	-	-	-	-	-	-	-\$3,000,000
PV Incentive	-	-	-	-	-	-	-	-	-	\$5,891,971
Electric Bill Savings	\$180,167	\$182,843	\$185,519	\$188,190	\$190,855	\$193,510	\$196,152	\$198,779	\$201,388	\$4,741,036
Cash	\$180,167	\$182,843	\$185,519	\$188,190	\$190,855	\$193,510	\$196,152	\$198,779	\$201,388	\$7,633,007
Total Cash Flow	\$180,167	\$182,843	\$185,519	\$188,190	\$190,855	\$193,510	\$196,152	\$198,779	\$201,388	\$7,633,007
Cumulative Cash Flow	\$6,095,771	\$6,278,614	\$6,464,133	\$6,652,323	\$6,843,177	\$7,036,687	\$7,232,839	\$7,431,619	\$7,633,007	-