



New Jersey's Clean Energy Program

LGEA Exit Meeting for:
Union Township Public Schools

TRC Energy Services

January 29, 2019

Introductions



Union Township Public Schools

- Gregory Tatum – Superintendent
- Manny Vieira – Assistant Business Administrator
- Barry Loessel – Supervisor of Buildings & Grounds

Schneider-Electric

- Daniel Riggle – Account Executive

NJ Clean Energy Program

- Brian DeLuca, CEM – TRC Program Manager
- Moussa Traore – TRC Auditor
- Elizabeth Ebinger – TRC Account Manager
- Ken Sheehan – BPU Ombudsman
- Arif Welcher – BPU Ombudsman
- Mike Thulen – ESIP Coordinator

Agenda



- The audit process overview
- Energy use & existing conditions
- Review of **E**nergy **C**onservation **M**easures (ECMs) identified
- Questions or concerns regarding the draft audit report
- Overview of NJCEP equipment incentives
- Next steps for Union Township Public Schools

LGEA Process



- Application Approval
- Scheduling Call
- Audit
- Benchmarking & Analysis
- Draft Report
- Exit Meeting Presentation
- Final Report

Site Visit and Utility Analysis



Overview of Systems, Baseline & Existing Conditions:

- Building Envelope
- Lighting System
- HVAC and Mechanical Systems
- Plug Load Equipment
- Food Service and Refrigeration Systems

Utility Consumption:

- Electric Consumption and Costs
- Natural Gas Consumption and Costs

Sites Visited/Analyzed

- Union High School
- Burnett Middle School
- Kawameeh Middle School
- Jefferson Elementary School
- Battle Hill Elementary School
- Connecticut Farms School
- Franklin Elementary School
- Hannah Caldwell Elementary
- Livingston Elementary School
- Washington Elementary School
- Hamilton Office
- Field House
- Administration Building

Benchmarking



Union High School

ENERGY STAR® Statement of Energy Performance

73
ENERGY STAR® Score¹

Union High School
 Primary Property Type: K-12 School
 Gross Floor Area (ft²): 358,161
 Built: 1956
 For Year Ending: September 30, 2017
 Date Generated: October 22, 2018

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information	
Property Address	Property Owner Primary Contact
Union High School 2350 North Third Street Union, California 07083	_____
Property ID: 6455032	

Energy Consumption and Energy Use Intensity (EUI)			
Site EUI	Annual Energy by Fuel	National Median Comparison	
52.1 kBtu/ft²	Electric - Grid (kBtu) 8,272,912 (44%) Natural Gas (kBtu) 10,379,884 (56%)	National Median Site EUI (kBtu/ft²) 67.7 National Median Source EUI (kBtu/ft²) 123.7 % Diff from National Median Source EUI -23%	
Source EUI		Annual Emissions	
95.1 kBtu/ft²		Greenhouse Gas Emissions (Metric Tons CO2e/year) 1,390	

Signature & Stamp of Verifying Professional
 I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

ENERGY STAR Scores are percentile ranking from 1 (least efficient) to 100 (most efficient). It compares your building's energy performance to similar buildings nationwide.

Union Township Public Schools	ENERGY STAR Score
Union High School	73
Burnett Middle School	63
Kawameeh Middle School	72
Jefferson Elementary School	55
Battle Hill Elementary School	82
Connecticut Farms School	66
Franklin Elementary	53
Hannah Caldwell Elementary	32
Livingston Elementary School	36
Washington Elementary School	66
Hamilton Office	51
Field House	N/A
Administration Building	15

All Opportunities (part 1)



Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades	1,134,806	359.2	-209.8	\$181,866.75	\$659,915.97	\$121,197.00	\$538,718.97	3.0	1,118,176
Install LED Fixtures	250,392	89.6	-25.5	\$40,387.22	\$285,464.32	\$31,905.00	\$253,559.32	6.3	249,152
Retrofit Fluorescent Fixtures with LED Lamps and Drivers	3,049	0.8	-0.6	\$498.72	\$1,302.68	\$186.00	\$1,116.68	2.2	2,995
Retrofit Fixtures with LED Lamps	877,029	268.5	-182.7	\$140,290.48	\$369,890.27	\$89,106.00	\$280,784.27	2.0	861,768
Install LED Exit Signs	4,336	0.3	-0.9	\$690.33	\$3,258.70	\$0.00	\$3,258.70	4.7	4,260
Lighting Control Measures	208,926	55.9	-43.9	\$33,032.93	\$242,954.00	\$25,350.00	\$217,604.00	6.6	205,251
Install Occupancy Sensor Lighting Controls	180,005	48.8	-37.8	\$28,342.73	\$200,194.00	\$25,245.00	\$174,949.00	6.2	176,838
Install High/Low Lighting Controls	28,921	7.1	-6.1	\$4,690.20	\$42,760.00	\$105.00	\$42,655.00	9.1	28,413
Motor Upgrades	15,390	5.2	0.0	\$2,566.06	\$104,033.30	\$0.00	\$104,033.30	40.5	15,498
Premium Efficiency Motors	15,390	5.2	0.0	\$2,566.06	\$104,033.30	\$0.00	\$104,033.30	40.5	15,498
Variable Frequency Drive (VFD) Measures	270,857	88.2	0.0	\$42,270.97	\$248,702.91	\$22,500.00	\$226,202.91	5.4	272,751
Install VFDs on Constant Volume (CV) Fans	223,306	75.6	0.0	\$34,634.40	\$177,372.86	\$21,000.00	\$156,372.86	4.5	224,867
Install VFDs on Chilled Water Pumps	23,737	8.2	0.0	\$3,727.50	\$25,243.25	\$0.00	\$25,243.25	6.8	23,903
Install VFDs on Heating Water Pumps	16,564	5.0	0.0	\$2,770.56	\$38,084.10	\$0.00	\$38,084.10	13.7	16,680
Install VFDs on Cooling Tower Fans	7,250	-0.6	0.0	\$1,138.51	\$8,002.70	\$1,500.00	\$6,502.70	5.7	7,301
Electric Unitary HVAC Measures	66,247	71.5	0.0	\$10,279.24	\$662,009.81	\$29,105.00	\$632,904.81	61.6	66,710
Install High Efficiency Air Conditioning Units	65,437	71.1	0.0	\$10,147.26	\$658,039.13	\$28,944.00	\$629,095.13	62.0	65,894
Install High Efficiency Heat Pumps	810	0.4	0.0	\$131.98	\$3,970.68	\$161.00	\$3,809.68	28.9	816
Electric Chiller Replacement	22,176	37.1	0.0	\$3,482.42	\$153,573.16	\$5,400.00	\$148,173.16	42.5	22,331
Install High Efficiency Chillers	22,176	37.1	0.0	\$3,482.42	\$153,573.16	\$5,400.00	\$148,173.16	42.5	22,331

All Opportunities (part 2)



Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement	0	0.0	808.6	\$8,399.91	\$1,119,630.22	\$13,315.20	\$1,106,315.02	131.7	94,676
Install High Efficiency Hot Water Boilers	0	0.0	193.8	\$2,211.76	\$169,729.95	\$400.00	\$169,329.95	76.6	22,690
Install High Efficiency Steam Boilers	0	0.0	526.7	\$5,275.69	\$914,835.03	\$12,915.20	\$901,919.83	171.0	61,675
Install High Efficiency Unit Heaters	0	0.0	88.1	\$912.46	\$35,065.24	\$0.00	\$35,065.24	38.4	10,311
HVAC System Improvements	8,566	0.0	88.5	\$2,226.03	\$37,978.89	\$0.00	\$37,978.89	17.1	18,983
Implement Demand Control Ventilation (DCV)	5,617	0.0	22.9	\$1,052.12	\$36,704.34	\$0.00	\$36,704.34	34.9	8,340
Install Pipe Insulation	2,949	0.0	65.5	\$1,173.91	\$1,274.55	\$0.00	\$1,274.55	1.1	10,644
Domestic Water Heating Upgrade	0	0.0	240.9	\$2,405.17	\$138,237.86	\$4,801.40	\$133,436.46	55.5	28,211
Install High Efficiency Gas-Fired Water Heater	0	0.0	136.1	\$1,330.09	\$137,814.83	\$4,801.40	\$133,013.43	100.0	15,934
Install Low-Flow DHW Devices	0	0.0	104.9	\$1,075.08	\$423.03	\$0.00	\$423.03	0.4	12,277
Food Service Equipment & Refrigeration Measures	33,186	3.8	12.5	\$5,610.84	\$65,238.56	\$4,725.00	\$60,513.56	10.8	34,885
Food Service Equipment Replacement	0	0.0	12.5	\$138.90	\$7,118.81	\$500.00	\$6,618.81	47.7	1,467
Refrigerator/Freezer Case Electrically Commutated Motors	2,635	0.3	0.0	\$393.05	\$3,336.30	\$0.00	\$3,336.30	8.5	2,654
Replace Refrigeration Equipment	30,551	3.5	0.0	\$5,078.89	\$54,783.45	\$4,225.00	\$50,558.45	10.0	30,785
Plug Load Equipment Control - Vending Machine	26,132	3.0	0.0	\$3,907.28	\$3,910.00	\$0.00	\$3,910.00	1.0	26,315
Vending Machine Control	26,132	3.0	0.0	\$3,907.28	\$3,910.00	\$0.00	\$3,910.00	1.0	26,315
TOTALS	1,786,287	623.9	896.9	\$296,047.60	\$3,436,184.68	\$226,393.60	\$3,209,791.08	10.8	1,903,787

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Pay back Period is based on net measure costs (i.e. after incentives).

Cost Effective Opportunities*



* Opportunities considered cost effective have a payback period less than 2/3rds of the useful life of the measure

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		1,134,806	359.2	-209.8	\$181,866.75	\$659,915.97	\$121,197.00	\$538,718.97	3.0	1,118,176
ECM 1	Install LED Fixtures	250,392	89.6	-25.5	\$40,387.22	\$285,464.32	\$31,905.00	\$253,559.32	6.3	249,152
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	3,049	0.8	-0.6	\$498.72	\$1,302.68	\$186.00	\$1,116.68	2.2	2,995
ECM 3	Retrofit Fixtures with LED Lamps	877,029	268.5	-182.7	\$140,290.48	\$369,890.27	\$89,106.00	\$280,784.27	2.0	861,768
ECM 4	Install LED Exit Signs	4,336	0.3	-0.9	\$690.33	\$3,258.70	\$0.00	\$3,258.70	4.7	4,260
Lighting Control Measures		208,926	55.9	-43.9	\$33,032.93	\$242,954.00	\$25,350.00	\$217,604.00	6.6	205,251
ECM 5	Install Occupancy Sensor Lighting Controls	180,005	48.8	-37.8	\$28,342.73	\$200,194.00	\$25,245.00	\$174,949.00	6.2	176,838
ECM 6	Install High/Low Lighting Controls	28,921	7.1	-6.1	\$4,690.20	\$42,760.00	\$105.00	\$42,655.00	9.1	28,413
Motor Upgrades		12,551	4.3	0.0	\$2,109.94	\$64,300.54	\$0.00	\$64,300.54	30.5	12,639
ECM 7	Premium Efficiency Motors	12,551	4.3	0.0	\$2,109.94	\$64,300.54	\$0.00	\$64,300.54	30.5	12,639
Variable Frequency Drive (VFD) Measures		264,648	85.3	0.0	\$41,188.84	\$226,451.06	\$22,500.00	\$203,951.06	5.0	266,499
ECM 8	Install VFDs on Constant Volume (CV) Fans	223,306	75.6	0.0	\$34,634.40	\$177,372.86	\$21,000.00	\$156,372.86	4.5	224,867
ECM 9	Install VFDs on Chilled Water Pumps	23,737	8.2	0.0	\$3,727.50	\$25,243.25	\$0.00	\$25,243.25	6.8	23,903
ECM 10	Install VFDs on Heating Water Pumps	10,356	2.1	0.0	\$1,688.43	\$15,832.25	\$0.00	\$15,832.25	9.4	10,428
ECM 11	Install VFDs on Cooling Tower Fans	7,250	-0.6	0.0	\$1,138.51	\$8,002.70	\$1,500.00	\$6,502.70	5.7	7,301
HVAC System Improvements		2,949	0.0	65.5	\$1,173.91	\$1,274.55	\$0.00	\$1,274.55	1.1	10,644
ECM 12	Install Pipe Insulation	2,949	0.0	65.5	\$1,173.91	\$1,274.55	\$0.00	\$1,274.55	1.1	10,644
Domestic Water Heating Upgrade		0	0.0	104.9	\$1,075.08	\$423.03	\$0.00	\$423.03	0.4	12,277
ECM 13	Install Low-Flow DHW Devices	0	0.0	104.9	\$1,075.08	\$423.03	\$0.00	\$423.03	0.4	12,277
Food Service Equipment & Refrigeration Measures		25,189	2.9	0.0	\$4,214.81	\$39,768.75	\$3,000.00	\$36,768.75	8.7	25,365
ECM 14	Refrigerator/Freezer Case Electrically Commutated Motors	2,635	0.3	0.0	\$393.05	\$3,336.30	\$0.00	\$3,336.30	8.5	2,654
ECM 15	Replace Refrigeration Equipment	22,553	2.6	0.0	\$3,821.76	\$36,432.45	\$3,000.00	\$33,432.45	8.7	22,711
Plug Load Equipment Control - Vending Machine		26,132	3.0	0.0	\$3,907.28	\$3,910.00	\$0.00	\$3,910.00	1.0	26,315
ECM 16	Vending Machine Control	26,132	3.0	0.0	\$3,907.28	\$3,910.00	\$0.00	\$3,910.00	1.0	26,315
TOTALS		1,675,202	510.5	-83.3	\$268,569.54	\$1,238,997.90	\$172,047.00	\$1,066,950.90	4.0	1,677,165

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Pay back Period is based on net measure costs (i.e. after incentives).

Union High School



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		41,488	5.7	-3	\$5,414	\$81,212	\$34,595	\$3,981	\$30,614	5.7	41,459
ECM 1	Install LED Fixtures	30,551	4.2	0	\$4,002	\$60,030	\$31,391	\$3,500	\$27,891	7.0	30,714
ECM 2	Retrofit Fixtures with LED Lamps	10,937	1.5	-2	\$1,412	\$21,183	\$3,205	\$481	\$2,724	1.9	10,745
Lighting Control Measures		24,528	3.3	-5	\$3,167	\$25,337	\$16,470	\$1,645	\$14,825	4.7	24,099
ECM 3	Install Occupancy Sensor Lighting Controls	24,528	3.3	-5	\$3,167	\$25,337	\$16,470	\$1,645	\$14,825	4.7	24,099
Electric Unitary HVAC Measures		22,187	12.6	0	\$2,909	\$43,641	\$183,955	\$9,399	\$174,557	60.0	22,342
	Install High Efficiency Air Conditioning Units	22,187	12.6	0	\$2,909	\$43,641	\$183,955	\$9,399	\$174,557	60.0	22,342
HVAC System Improvements		3,035	0.0	0	\$398	\$5,970	\$10,875	\$0	\$10,875	27.3	3,057
	Implement Demand Control Ventilation (DCV)	3,035	0.0	0	\$398	\$5,970	\$10,875	\$0	\$10,875	27.3	3,057
Domestic Water Heating Upgrade		0	0.0	72	\$693	\$10,396	\$101,222	\$3,535	\$97,687	141.0	8,461
	Install High Efficiency Gas-Fired Water Heater	0	0.0	72	\$693	\$10,396	\$101,222	\$3,535	\$97,687	141.0	8,461
Food Service & Refrigeration Measures		12,337	1.4	0	\$1,618	\$9,471	\$3,127	\$0	\$3,127	1.9	12,423
ECM 4	Refrigerator/Freezer Case Electrically Commutated Motors	1,054	0.1	0	\$138	\$2,073	\$1,517	\$0	\$1,517	11.0	1,062
ECM 5	Vending Machine Control	11,283	1.3	0	\$1,480	\$7,398	\$1,610	\$0	\$1,610	1.1	11,362
TOTALS		103,575	23.0	64	\$14,200	\$176,028	\$350,245	\$18,560	\$331,685	23.4	111,841

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Burnet Middle School



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		232,756	53.4	-48	\$37,066	\$555,989	\$110,938	\$25,025	\$85,913	2.3	228,818
ECM 1	Install LED Fixtures	62,707	13.9	-12	\$9,994	\$149,905	\$46,112	\$8,840	\$37,272	3.7	61,743
ECM 2	Retrofit Fixtures with LED Lamps	165,713	39.2	-35	\$26,382	\$395,729	\$61,567	\$16,185	\$45,382	1.7	162,815
ECM 3	Install LED Exit Signs	4,336	0.3	-1	\$690	\$10,355	\$3,259	\$0	\$3,259	4.7	4,260
Lighting Control Measures		48,864	11.6	-10	\$7,779	\$62,234	\$57,258	\$5,180	\$52,078	6.7	48,009
ECM 4	Install Occupancy Sensor Lighting Controls	39,246	9.3	-8	\$6,248	\$49,984	\$41,658	\$5,180	\$36,478	5.8	38,560
ECM 5	Install High/Low Lighting Controls	9,618	2.2	-2	\$1,531	\$12,250	\$15,600	\$0	\$15,600	10.2	9,450
Motor Upgrades		1,878	0.5	0	\$303	\$4,539	\$6,568	\$0	\$6,568	21.7	1,891
	Premium Efficiency Motors	1,878	0.5	0	\$303	\$4,539	\$6,568	\$0	\$6,568	21.7	1,891
Variable Frequency Drive (VFD) Measures		25,868	8.3	0	\$4,169	\$62,529	\$22,126	\$2,320	\$19,806	4.8	26,048
ECM 6	Install VFDs on Constant Volume (CV) Fans	25,868	8.3	0	\$4,169	\$62,529	\$22,126	\$2,320	\$19,806	4.8	26,048
Electric Unitary HVAC Measures		3,716	5.1	0	\$599	\$8,984	\$101,007	\$988	\$100,019	167.0	3,742
	Install High Efficiency Air Conditioning Units	3,716	5.1	0	\$599	\$8,984	\$101,007	\$988	\$100,019	167.0	3,742
Food Service & Refrigeration Measures		9,555	1.1	0	\$1,540	\$17,424	\$11,406	\$375	\$11,031	7.2	9,622
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	1,581	0.2	0	\$255	\$3,822	\$1,820	\$0	\$1,820	7.1	1,592
ECM 8	Replace Refrigeration Equipment	6,362	0.7	0	\$1,025	\$12,303	\$9,356	\$375	\$8,981	8.8	6,407
ECM 9	Vending Machine Control	1,612	0.2	0	\$260	\$1,299	\$230	\$0	\$230	0.9	1,623
TOTALS		322,637	80.0	-58	\$51,455	\$711,699	\$309,303	\$33,888	\$275,416	5.4	318,131

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Kawameeh Middle School



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		131,437	48.8	-25	\$21,537	\$323,060	\$86,926	\$15,491	\$71,435	3.3	129,441
ECM 1	Install LED Fixtures	29,759	9.3	-4	\$4,894	\$73,411	\$31,819	\$2,480	\$29,339	6.0	29,541
ECM 2	Retrofit Fixtures with LED Lamps	101,679	39.5	-21	\$16,643	\$249,649	\$55,106	\$13,011	\$42,095	2.5	99,900
Lighting Control Measures		26,291	8.7	-5	\$4,304	\$34,428	\$36,722	\$4,050	\$32,672	7.6	25,832
ECM 3	Install Occupancy Sensor Lighting Controls	20,964	7.7	-4	\$3,432	\$27,452	\$32,922	\$4,050	\$28,872	8.4	20,597
ECM 4	Install High/Low Lighting Controls	5,327	1.0	-1	\$872	\$6,976	\$3,800	\$0	\$3,800	4.4	5,234
Motor Upgrades		486	0.2	0	\$81	\$1,208	\$3,501	\$0	\$3,501	43.5	490
	Premium Efficiency Motors	486	0.2	0	\$81	\$1,208	\$3,501	\$0	\$3,501	43.5	490
Variable Frequency Drive (VFD) Measures		14,841	6.0	0	\$2,457	\$36,854	\$11,210	\$1,680	\$9,530	3.9	14,945
ECM 5	Install VFDs on Constant Volume (CV) Fans	14,841	6.0	0	\$2,457	\$36,854	\$11,210	\$1,680	\$9,530	3.9	14,945
Electric Unitary HVAC Measures		3,014	2.1	0	\$499	\$7,483	\$26,952	\$552	\$26,400	52.9	3,035
	Install High Efficiency Air Conditioning Units	3,014	2.1	0	\$499	\$7,483	\$26,952	\$552	\$26,400	52.9	3,035
Gas Heating (HVAC/Process) Replacement		0	0.0	165	\$1,472	\$29,447	\$458,884	\$0	\$458,884	311.7	19,356
	Install High Efficiency Steam Boilers	0	0.0	165	\$1,472	\$29,447	\$458,884	\$0	\$458,884	311.7	19,356
Domestic Water Heating Upgrade		0	0.0	40	\$354	\$4,373	\$11,658	\$398	\$11,260	31.8	4,648
	Install High Efficiency Gas-Fired Water Heater	0	0.0	19	\$168	\$2,514	\$11,500	\$398	\$11,102	66.2	2,203
ECM 6	Install Low-Flow DHW Devices	0	0.0	21	\$186	\$1,859	\$158	\$0	\$158	0.8	2,444
Food Service & Refrigeration Measures		1,751	0.2	0	\$290	\$1,610	\$2,072	\$150	\$1,922	6.6	1,763
	Replace Refrigeration Equipment	139	0.0	0	\$23	\$276	\$1,842	\$150	\$1,692	73.7	140
ECM 7	Vending Machine Control	1,612	0.2	0	\$267	\$1,334	\$230	\$0	\$230	0.9	1,623
TOTALS		177,820	66.0	175	\$30,993	\$438,463	\$637,924	\$22,321	\$615,603	19.9	199,508

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program
 ** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Jefferson Elementary School



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		83,912	24.1	-16	\$12,095	\$181,431	\$47,322	\$9,949	\$37,373	3.1	82,637
ECM 1	Install LED Fixtures	5,427	0.6	0	\$793	\$11,896	\$5,796	\$600	\$5,196	6.6	5,465
ECM 2	Retrofit Fixtures with LED Lamps	78,485	23.5	-16	\$11,302	\$169,534	\$41,526	\$9,349	\$32,177	2.8	77,172
Lighting Control Measures		354	0.1	0	\$51	\$407	\$540	\$70	\$470	9.2	347
ECM 3	Install Occupancy Sensor Lighting Controls	354	0.1	0	\$51	\$407	\$540	\$70	\$470	9.2	347
Motor Upgrades		348	0.1	0	\$51	\$763	\$23,376	\$0	\$23,376	459.8	350
	Premium Efficiency Motors	348	0.1	0	\$51	\$763	\$23,376	\$0	\$23,376	459.8	350
Variable Frequency Drive (VFD) Measures		98,053	33.4	0	\$14,330	\$214,948	\$77,018	\$9,200	\$67,818	4.7	98,739
ECM 4	Install VFDs on Constant Volume (CV) Fans	98,053	33.4	0	\$14,330	\$214,948	\$77,018	\$9,200	\$67,818	4.7	98,739
HVAC System Improvements		942	0.0	11	\$249	\$3,728	\$13,594	\$0	\$13,594	54.7	2,179
	Implement Demand Control Ventilation (DCV)	942	0.0	11	\$249	\$3,728	\$13,594	\$0	\$13,594	54.7	2,179
Food Service & Refrigeration Measures		1,612	0.2	0	\$236	\$1,178	\$230	\$0	\$230	1.0	1,623
ECM 5	Vending Machine Control	1,612	0.2	0	\$236	\$1,178	\$230	\$0	\$230	1.0	1,623
TOTALS		185,219	57.9	-5	\$27,011	\$402,453	\$162,081	\$19,219	\$142,862	5.3	185,875

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Battle Hill Elementary School



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		81,095	24.9	-14	\$13,986	\$209,793	\$54,746	\$9,653	\$45,093	3.2	79,972
ECM 1	Install LED Fixtures	20,424	3.9	-2	\$3,540	\$53,101	\$27,047	\$2,800	\$24,247	6.8	20,342
ECM 2	Retrofit Fixtures with LED Lamps	60,671	21.0	-13	\$10,446	\$156,692	\$27,699	\$6,853	\$20,846	2.0	59,631
Lighting Control Measures		15,734	4.2	-3	\$2,709	\$21,668	\$18,512	\$2,000	\$16,512	6.1	15,458
ECM 3	Install Occupancy Sensor Lighting Controls	13,482	3.6	-3	\$2,321	\$18,567	\$15,712	\$2,000	\$13,712	5.9	13,246
ECM 4	Install High/Low Lighting Controls	2,252	0.6	0	\$388	\$3,101	\$2,800	\$0	\$2,800	7.2	2,212
Motor Upgrades		127	0.1	0	\$22	\$333	\$6,287	\$0	\$6,287	283.3	128
	Premium Efficiency Motors	127	0.1	0	\$22	\$333	\$6,287	\$0	\$6,287	283.3	128
Variable Frequency Drive (VFD) Measures		6,209	2.9	0	\$1,082	\$16,232	\$22,252	\$0	\$22,252	20.6	6,252
	Install VFDs on Heating Water Pumps	6,209	2.9	0	\$1,082	\$16,232	\$22,252	\$0	\$22,252	20.6	6,252
Electric Unitary HVAC Measures		794	0.7	0	\$138	\$2,077	\$14,154	\$0	\$14,154	102.2	800
	Install High Efficiency Air Conditioning Units	794	0.7	0	\$138	\$2,077	\$14,154	\$0	\$14,154	102.2	800
Domestic Water Heating Upgrade		0	0.0	48	\$493	\$5,938	\$8,752	\$300	\$8,451	17.1	5,625
	Install High Efficiency Gas-Fired Water Heater	0	0.0	20	\$201	\$3,015	\$8,680	\$300	\$8,380	41.7	2,291
ECM 5	Install Low-Flow DHW Devices	0	0.0	28	\$292	\$2,923	\$72	\$0	\$72	0.2	3,333
Food Service & Refrigeration Measures		5,829	0.7	0	\$1,016	\$10,226	\$8,994	\$750	\$8,244	8.1	5,870
ECM 6	Replace Refrigeration Equipment	4,218	0.5	0	\$735	\$8,821	\$8,764	\$750	\$8,014	10.9	4,247
ECM 7	Vending Machine Control	1,612	0.2	0	\$281	\$1,405	\$230	\$0	\$230	0.8	1,623
TOTALS		109,788	33.5	30	\$19,447	\$266,267	\$133,697	\$12,703	\$120,993	6.2	114,106

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.
 ** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Connecticut Farms School



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		67,590	27.4	-12	\$11,174	\$167,609	\$37,359	\$6,622	\$30,737	2.8	66,633
ECM 1	Install LED Fixtures	12,148	3.3	-1	\$2,024	\$30,356	\$11,521	\$860	\$10,661	5.3	12,146
ECM 2	Retrofit Fixtures with LED Lamps	55,441	24.1	-11	\$9,150	\$137,252	\$25,838	\$5,762	\$20,076	2.2	54,487
Lighting Control Measures		10,133	3.5	-2	\$1,672	\$13,377	\$14,398	\$1,730	\$12,668	7.6	9,956
ECM 3	Install Occupancy Sensor Lighting Controls	8,937	3.2	-2	\$1,475	\$11,798	\$12,598	\$1,730	\$10,868	7.4	8,780
ECM 4	Install High/Low Lighting Controls	1,197	0.3	0	\$197	\$1,580	\$1,800	\$0	\$1,800	9.1	1,176
Motor Upgrades		0	0.0	0	\$0	\$0	\$1,847	\$0	\$1,847	0.0	0
ECM 5	Premium Efficiency Motors	0	0.0	0	\$0	\$0	\$1,847	\$0	\$1,847	0.0	0
Variable Frequency Drive (VFD) Measures		9,854	4.3	0	\$1,648	\$24,720	\$5,194	\$1,200	\$3,994	2.4	9,923
ECM 6	Install VFDs on Constant Volume (CV) Fans	9,854	4.3	0	\$1,648	\$24,720	\$5,194	\$1,200	\$3,994	2.4	9,923
Electric Unitary HVAC Measures		4,205	5.3	0	\$703	\$10,549	\$48,360	\$3,160	\$45,200	64.3	4,234
	Install High Efficiency Air Conditioning Units	4,205	5.3	0	\$703	\$10,549	\$48,360	\$3,160	\$45,200	64.3	4,234
Gas Heating (HVAC/Process) Replacement		0	0.0	61	\$650	\$13,007	\$215,905	\$0	\$215,905	332.0	7,172
	Install High Efficiency Steam Boilers	0	0.0	61	\$650	\$13,007	\$215,905	\$0	\$215,905	332.0	7,172
HVAC System Improvements		995	0.0	12	\$298	\$4,472	\$8,157	\$0	\$8,157	27.4	2,455
	Implement Demand Control Ventilation (DCV)	995	0.0	12	\$298	\$4,472	\$8,157	\$0	\$8,157	27.4	2,455
Domestic Water Heating Upgrade		0	0.0	31	\$332	\$3,325	\$79	\$0	\$79	0.2	3,667
ECM 7	Install Low-Flow DHW Devices	0	0.0	31	\$332	\$3,325	\$79	\$0	\$79	0.2	3,667
Food Service & Refrigeration Measures		1,612	0.2	0	\$270	\$1,348	\$230	\$0	\$230	0.9	1,623
ECM 8	Vending Machine Control	1,612	0.2	0	\$270	\$1,348	\$230	\$0	\$230	0.9	1,623
TOTALS		94,389	40.7	91	\$16,748	\$238,407	\$331,529	\$12,712	\$318,817	19.0	105,663

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Franklin Elementary School



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		67,130	21.8	-13	\$11,455	\$171,823	\$42,520	\$8,985	\$33,535	2.9	66,041
ECM 1	Install LED Fixtures	9,670	2.6	-1	\$1,657	\$24,854	\$17,419	\$2,850	\$14,569	8.8	9,586
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	88	0.0	0	\$15	\$225	\$65	\$6	\$59	3.9	86
ECM 3	Retrofit Fixtures with LED Lamps	57,372	19.1	-12	\$9,783	\$146,744	\$25,036	\$6,129	\$18,907	1.9	56,368
Lighting Control Measures		11,436	3.7	-2	\$1,950	\$15,601	\$16,624	\$1,895	\$14,729	7.6	11,236
ECM 4	Install Occupancy Sensor Lighting Controls	9,761	3.2	-2	\$1,664	\$13,315	\$14,024	\$1,895	\$12,129	7.3	9,590
ECM 5	Install High/Low Lighting Controls	1,676	0.5	0	\$286	\$2,286	\$2,600	\$0	\$2,600	9.1	1,646
Motor Upgrades		8,821	2.9	0	\$1,525	\$22,868	\$29,946	\$0	\$29,946	19.6	8,882
ECM 6	Premium Efficiency Motors	8,821	2.9	0	\$1,525	\$22,868	\$29,946	\$0	\$29,946	19.6	8,882
Variable Frequency Drive (VFD) Measures		7,722	2.9	0	\$1,335	\$20,020	\$6,552	\$800	\$5,752	4.3	7,776
ECM 7	Install VFDs on Constant Volume (CV) Fans	7,722	2.9	0	\$1,335	\$20,020	\$6,552	\$800	\$5,752	4.3	7,776
Electric Unitary HVAC Measures		20,304	32.2	0	\$3,509	\$52,638	\$157,499	\$9,492	\$148,007	42.2	20,446
	Install High Efficiency Air Conditioning Units	20,304	32.2	0	\$3,509	\$52,638	\$157,499	\$9,492	\$148,007	42.2	20,446
Gas Heating (HVAC/Process) Replacement		0	0.0	114	\$1,268	\$25,359	\$97,303	\$5,235	\$92,068	72.6	13,389
	Install High Efficiency Steam Boilers	0	0.0	114	\$1,268	\$25,359	\$97,303	\$5,235	\$92,068	72.6	13,389
HVAC System Improvements		390	0.0	26	\$360	\$4,232	\$3,026	\$0	\$3,026	8.4	3,485
	Implement Demand Control Ventilation (DCV)	390	0.0	0	\$67	\$1,010	\$2,719	\$0	\$2,719	40.4	392
ECM 8	Install Pipe Insulation	0	0.0	26	\$293	\$3,222	\$308	\$0	\$308	1.1	3,093
Domestic Water Heating Upgrade		0	0.0	26	\$286	\$3,186	\$4,962	\$170	\$4,792	16.8	3,021
	Install High Efficiency Gas-Fired Water Heater	0	0.0	6	\$65	\$976	\$4,912	\$170	\$4,742	72.8	687
ECM 9	Install Low-Flow DHW Devices	0	0.0	20	\$221	\$2,210	\$50	\$0	\$50	0.2	2,333
Food Service & Refrigeration Measures		12,763	1.5	13	\$2,345	\$26,187	\$23,677	\$2,250	\$21,427	9.1	14,319
	Food Service Equipment Replacement	0	0.0	13	\$139	\$1,667	\$7,119	\$500	\$6,619	47.7	1,467
ECM 10	Replace Refrigeration Equipment	11,151	1.3	0	\$1,927	\$23,128	\$16,328	\$1,750	\$14,578	7.6	11,229
ECM 11	Vending Machine Control	1,612	0.2	0	\$279	\$1,393	\$230	\$0	\$230	0.8	1,623
TOTALS		128,565	65.0	163	\$24,032	\$341,914	\$382,108	\$28,827	\$353,281	14.7	148,595

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program
 ** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Hannah Caldwell Elementary School



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		137,496	34.2	-25	\$21,303	\$319,549	\$64,444	\$12,635	\$51,809	2.4	135,498
ECM 1	Install LED Fixtures	18,391	2.5	0	\$2,884	\$43,256	\$21,858	\$2,005	\$19,853	6.9	18,476
ECM 2	Retrofit Fixtures with LED Lamps	119,105	31.6	-25	\$18,420	\$276,293	\$42,586	\$10,630	\$31,956	1.7	117,022
Lighting Control Measures		23,760	6.0	-5	\$3,674	\$29,395	\$19,980	\$2,350	\$17,630	4.8	23,344
ECM 3	Install Occupancy Sensor Lighting Controls	21,097	5.3	-4	\$3,263	\$26,101	\$16,980	\$2,350	\$14,630	4.5	20,728
ECM 4	Install High/Low Lighting Controls	2,663	0.7	-1	\$412	\$3,295	\$3,000	\$0	\$3,000	7.3	2,616
Motor Upgrades		3,610	1.2	0	\$567	\$8,503	\$23,668	\$0	\$23,668	41.8	3,635
ECM 5	Premium Efficiency Motors	3,610	1.2	0	\$567	\$8,503	\$23,668	\$0	\$23,668	41.8	3,635
Variable Frequency Drive (VFD) Measures		89,047	24.5	0	\$13,984	\$209,753	\$76,418	\$5,700	\$70,718	5.1	89,670
ECM 6	Install VFDs on Constant Volume (CV) Fans	49,480	15.0	0	\$7,770	\$116,552	\$30,069	\$4,200	\$25,869	3.3	49,826
ECM 7	Install VFDs on Chilled Water Pumps	23,737	8.2	0	\$3,728	\$55,913	\$25,243	\$0	\$25,243	6.8	23,903
ECM 8	Install VFDs on Heating Water Pumps	8,580	1.9	0	\$1,347	\$20,211	\$13,103	\$0	\$13,103	9.7	8,640
ECM 9	Install VFDs on Cooling Tower Fans	7,250	-0.6	0	\$1,139	\$17,078	\$8,003	\$1,500	\$6,503	5.7	7,301
Electric Unitary HVAC Measures		3,986	5.1	0	\$626	\$9,388	\$57,043	\$2,524	\$54,519	87.1	4,013
	Install High Efficiency Air Conditioning Units	3,986	5.1	0	\$626	\$9,388	\$57,043	\$2,524	\$54,519	87.1	4,013
Electric Chiller Replacement		22,176	37.1	0	\$3,482	\$69,648	\$153,573	\$5,400	\$148,173	42.5	22,331
	Install High Efficiency Chillers	22,176	37.1	0	\$3,482	\$69,648	\$153,573	\$5,400	\$148,173	42.5	22,331
Gas Heating (HVAC/Process) Replacement		0	0.0	194	\$2,212	\$44,235	\$169,730	\$400	\$169,330	76.6	22,690
	Install High Efficiency Hot Water Boilers	0	0.0	194	\$2,212	\$44,235	\$169,730	\$400	\$169,330	76.6	22,690
HVAC System Improvements		255	0.0	0	\$40	\$601	\$1,359	\$0	\$1,359	33.9	257
	Implement Demand Control Ventilation (DCV)	255	0.0	0	\$40	\$601	\$1,359	\$0	\$1,359	33.9	257
Food Service & Refrigeration Measures		9,814	1.1	0	\$1,541	\$16,345	\$16,969	\$1,075	\$15,894	10.3	9,882
	Replace Refrigeration Equipment	7,859	0.9	0	\$1,234	\$14,810	\$16,509	\$1,075	\$15,434	12.5	7,914
ECM 10	Vending Machine Control	1,954	0.2	0	\$307	\$1,535	\$460	\$0	\$460	1.5	1,968
TOTALS		290,143	109.2	164	\$47,429	\$707,417	\$583,184	\$30,084	\$553,100	11.7	311,320

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Livingston Elementary School



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		111,907	27.6	-21	\$18,307	\$274,605	\$51,557	\$7,051	\$44,506	2.4	110,208
ECM 1	Install LED Fixtures	22,206	4.3	-3	\$3,649	\$54,739	\$23,400	\$1,530	\$21,870	6.0	22,057
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,961	0.8	-1	\$484	\$7,256	\$1,238	\$180	\$1,058	2.2	2,909
ECM 3	Retrofit Fixtures with LED Lamps	86,741	22.5	-18	\$14,174	\$212,610	\$26,920	\$5,341	\$21,579	1.5	85,243
Lighting Control Measures		14,642	3.8	-3	\$2,392	\$19,138	\$18,420	\$1,575	\$16,845	7.0	14,386
ECM 4	Install Occupancy Sensor Lighting Controls	12,211	3.2	-3	\$1,995	\$15,961	\$12,150	\$1,575	\$10,575	5.3	11,997
ECM 5	Install High/Low Lighting Controls	2,431	0.6	-1	\$397	\$3,178	\$6,270	\$0	\$6,270	15.8	2,389
Electric Unitary HVAC Measures		1,143	1.5	0	\$189	\$2,837	\$4,355	\$0	\$4,355	23.0	1,151
	Install High Efficiency Air Conditioning Units	1,143	1.5	0	\$189	\$2,837	\$4,355	\$0	\$4,355	23.0	1,151
Food Service & Refrigeration Measures		1,612	0.2	0	\$267	\$1,334	\$230	\$0	\$230	0.9	1,623
ECM 6	Vending Machine Control	1,612	0.2	0	\$267	\$1,334	\$230	\$0	\$230	0.9	1,623
TOTALS		129,304	33.0	-24	\$21,155	\$297,915	\$74,563	\$8,626	\$65,937	3.1	127,368

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Washington Elementary School



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		95,245	23.9	-20	\$15,324	\$229,862	\$39,997	\$9,255	\$30,742	2.0	93,610
ECM 1	Install LED Fixtures	8,484	2.0	-2	\$1,367	\$20,512	\$11,231	\$2,000	\$9,231	6.7	8,367
ECM 2	Retrofit Fixtures with LED Lamps	86,761	21.9	-18	\$13,957	\$209,350	\$28,767	\$7,255	\$21,512	1.5	85,243
Lighting Control Measures		17,857	4.5	-4	\$2,873	\$22,981	\$20,806	\$2,230	\$18,576	6.5	17,545
ECM 3	Install Occupancy Sensor Lighting Controls	15,856	4.0	-3	\$2,551	\$20,405	\$17,106	\$2,230	\$14,876	5.8	15,579
ECM 4	Install High/Low Lighting Controls	2,001	0.5	0	\$322	\$2,575	\$3,700	\$0	\$3,700	11.5	1,966
Electric Unitary HVAC Measures		1,609	2.0	0	\$262	\$3,935	\$18,639	\$644	\$17,995	68.6	1,620
	Install High Efficiency Air Conditioning Units	1,609	2.0	0	\$262	\$3,935	\$18,639	\$644	\$17,995	68.6	1,620
HVAC System Improvements		2,949	0.0	13	\$620	\$6,818	\$527	\$0	\$527	0.9	4,536
ECM 5	Install Pipe Insulation	2,949	0.0	13	\$620	\$6,818	\$527	\$0	\$527	0.9	4,536
Domestic Water Heating Upgrade		0	0.0	20	\$203	\$3,051	\$11,500	\$398	\$11,102	54.6	2,291
	Install High Efficiency Gas-Fired Water Heater	0	0.0	20	\$203	\$3,051	\$11,500	\$398	\$11,102	54.6	2,291
Food Service & Refrigeration Measures		2,434	0.3	0	\$397	\$2,923	\$2,214	\$125	\$2,089	5.3	2,451
ECM 6	Replace Refrigeration Equipment	822	0.1	0	\$134	\$1,609	\$1,984	\$125	\$1,859	13.9	828
ECM 7	Vending Machine Control	1,612	0.2	0	\$263	\$1,314	\$230	\$0	\$230	0.9	1,623
TOTALS		120,094	30.7	10	\$19,679	\$269,569	\$93,684	\$12,652	\$81,032	4.1	122,054

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that pro

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Hamilton Office



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		25,027	14.3	-5	\$3,788	\$56,827	\$17,727	\$4,474	\$13,253	3.5	24,641
ECM 1	Install LED Fixtures	2,136	0.5	0	\$328	\$4,913	\$750	\$0	\$750	2.3	2,151
ECM 2	Retrofit Fixtures with LED Lamps	22,890	13.8	-5	\$3,461	\$51,914	\$16,977	\$4,474	\$12,503	3.6	22,490
Lighting Control Measures		5,622	3.3	-1	\$850	\$6,800	\$10,120	\$1,120	\$9,000	10.6	5,523
ECM 3	Install Occupancy Sensor Lighting Controls	5,246	3.1	-1	\$793	\$6,346	\$9,180	\$1,120	\$8,060	10.2	5,155
ECM 4	Install High/Low Lighting Controls	375	0.2	0	\$57	\$454	\$940	\$0	\$940	16.6	369
Motor Upgrades		121	0.1	0	\$19	\$278	\$800	\$0	\$800	43.2	122
ECM 5	Premium Efficiency Motors	121	0.1	0	\$19	\$278	\$800	\$0	\$800	43.2	122
Electric Unitary HVAC Measures		1,862	2.7	0	\$285	\$4,282	\$24,038	\$1,288	\$22,750	79.7	1,875
	Install High Efficiency Air Conditioning Units	1,862	2.7	0	\$285	\$4,282	\$24,038	\$1,288	\$22,750	79.7	1,875
Gas Heating (HVAC/Process) Replacement		0	0.0	186	\$1,885	\$37,701	\$142,743	\$7,680	\$135,063	71.6	21,759
	Install High Efficiency Steam Boilers	0	0.0	186	\$1,885	\$37,701	\$142,743	\$7,680	\$135,063	71.6	21,759
HVAC System Improvements		0	0.0	26	\$261	\$2,873	\$440	\$0	\$440	1.7	3,014
ECM 6	Install Pipe Insulation	0	0.0	26	\$261	\$2,873	\$440	\$0	\$440	1.7	3,014
Domestic Water Heating Upgrade		0	0.0	4	\$43	\$433	\$65	\$0	\$65	1.5	500
ECM 7	Install Low-Flow DHW Devices	0	0.0	4	\$43	\$433	\$65	\$0	\$65	1.5	500
TOTALS		32,631	20.4	210	\$7,132	\$109,194	\$195,932	\$14,562	\$181,370	25.4	57,435

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that pro

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Field House



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		26,271	42.9	-3	\$5,023	\$75,343	\$61,119	\$5,475	\$55,644	11.1	26,160
ECM 1	Install LED Fixtures	21,398	40.6	-1	\$4,100	\$61,507	\$56,801	\$4,440	\$52,361	12.8	21,425
ECM 2	Retrofit Fixtures with LED Lamps	4,873	2.3	-1	\$922	\$13,835	\$4,318	\$1,035	\$3,283	3.6	4,736
Lighting Control Measures		1,833	0.9	-1	\$347	\$2,775	\$5,330	\$595	\$4,735	13.7	1,780
ECM 3	Install Occupancy Sensor Lighting Controls	1,607	0.8	0	\$304	\$2,432	\$4,590	\$595	\$3,995	13.1	1,560
ECM 4	Install High/Low Lighting Controls	226	0.1	0	\$43	\$342	\$740	\$0	\$740	17.3	220
Motor Upgrades		0	0.0	0	\$0	\$0	\$2,048	\$0	\$2,048	0.0	0
ECM 5	Premium Efficiency Motors	0	0.0	0	\$0	\$0	\$2,048	\$0	\$2,048	0.0	0
Variable Frequency Drive (VFD) Measures		4,439	1.1	0	\$853	\$12,790	\$7,994	\$240	\$7,754	9.1	4,470
ECM 6	Install VFDs on Constant Volume (CV) Fans	2,663	0.9	0	\$512	\$7,674	\$5,265	\$240	\$5,025	9.8	2,682
ECM 7	Install VFDs on Heating Water Pumps	1,776	0.2	0	\$341	\$5,116	\$2,729	\$0	\$2,729	8.0	1,788
TOTALS		32,543	44.9	-3	\$6,222	\$90,907	\$76,492	\$6,310	\$70,182	11.3	32,409

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Administration Building



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		33,454	10.1	-5	\$5,393	\$80,899	\$10,666	\$2,601	\$8,065	1.5	33,057
ECM 1	Install LED Fixtures	7,092	1.7	0	\$1,155	\$17,327	\$320	\$0	\$320	0.3	7,142
ECM 2	Retrofit Fixtures with LED Lamps	26,362	8.5	-5	\$4,238	\$63,571	\$10,347	\$2,601	\$7,746	1.8	25,916
Lighting Control Measures		7,873	2.5	-2	\$1,265	\$10,122	\$7,620	\$910	\$6,710	5.3	7,735
ECM 3	Install Occupancy Sensor Lighting Controls	6,717	2.1	-1	\$1,080	\$8,636	\$6,210	\$805	\$5,405	5.0	6,600
ECM 4	Install High/Low Lighting Controls	1,156	0.4	0	\$186	\$1,486	\$1,410	\$105	\$1,305	7.0	1,136
Motor Upgrades		0	0.0	0	\$0	\$0	\$5,991	\$0	\$5,991	0.0	0
ECM 5	Premium Efficiency Motors	0	0.0	0	\$0	\$0	\$5,991	\$0	\$5,991	0.0	0
Variable Frequency Drive (VFD) Measures		14,824	4.9	0	\$2,415	\$36,219	\$19,938	\$1,360	\$18,578	7.7	14,928
ECM 6	Install VFDs on Constant Volume (CV) Fans	14,824	4.9	0	\$2,415	\$36,219	\$19,938	\$1,360	\$18,578	7.7	14,928
Electric Unitary HVAC Measures		3,428	2.2	0	\$558	\$8,375	\$26,008	\$1,059	\$24,949	44.7	3,452
	Install High Efficiency Air Conditioning Units	2,617	1.8	0	\$426	\$6,395	\$22,037	\$898	\$21,139	49.6	2,636
	Install High Efficiency Heat Pumps	810	0.4	0	\$132	\$1,980	\$3,971	\$161	\$3,810	28.9	816
Gas Heating (HVAC/Process) Replacement		0	0.0	88	\$912	\$13,687	\$35,065	\$0	\$35,065	38.4	10,311
	Install High Efficiency Unit Heaters	0	0.0	88	\$912	\$13,687	\$35,065	\$0	\$35,065	38.4	10,311
TOTALS		59,578	19.7	81	\$10,544	\$149,301	\$105,290	\$5,930	\$99,360	9.4	69,483

Solar Energy Generation Potential



Union Township Public Schools	None/Low	Medium	High
Union High School			X
Burnett Middle School			X
Kawameeh Middle School			X
Jefferson Elementary School			X
Battle Hill Elementary School			X
Connecticut Farms School			X
Franklin Elementary School			X
Hannah Caldwell Elementary			X
Livingston Elementary School			X
Washington Elementary School			X
Hamilton Office		X	
Field House	X		
Administration Building	X		

For more information on the SREC Registration Program (SRP) please visit:

<http://www.njcleanenergy.com/renewable-energy/programs/solar-renewable-energy-certificates-srec/new-jersey-solar-renewable-energy>

Energy Efficient Best Practices



- Reduce Air Leakage
- Close Doors and Windows
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Use Fans to Reduce Cooling Load
- Use Window Treatments/Coverings
- Clean and/or Replace HVAC filters
- Check and Seal Duct Leakage
- Perform Proper Boiler Maintenance
- Perform Proper Water Heater Maintenance
- Plug Load Controls
- Water Conservation

See individual reports for specific EE practices by building

Clean Energy Program Portfolio



ELIGIBLE SECTORS

Commercial, Industrial, Government, Non-Profit, Institutional and Multifamily

INCENTIVE PROGRAMS

Equipment Rebates:

- SmartStart
- CTEEP
(Customer Tailored Energy Efficiency Pilot)
- Direct Install
- Large Energy Users

Whole Buildings:

- Pay for Performance

Energy Generation:

- Combined Heat and Power (CHP)

OTHER PROGRAMS

Renewable Energy Generation:

- SREC Registration Program (SRP)

* eligible programs are highlighted in yellow

Recommended NJCEP Incentives per Building



Union Township Public Schools	Pay For Performance	Direct Install	SmartStart	CTEEP
Union High School			X	X
Burnett Middle School	X		X	X
Kawameeh Middle School		X	X	X
Jefferson Elementary School	X		X	X
Battle Hill Elementary School		X	X	X
Connecticut Farms School		X	X	X
Franklin Elementary School		X	X	X
Hannah Caldwell Elementary		X	X	X
Livingston Elementary School		X	X	X
Washington Elementary School		X	X	X
Hamilton Office		X	X	X
Field House		X	X	X
Administration Building		X	X	X

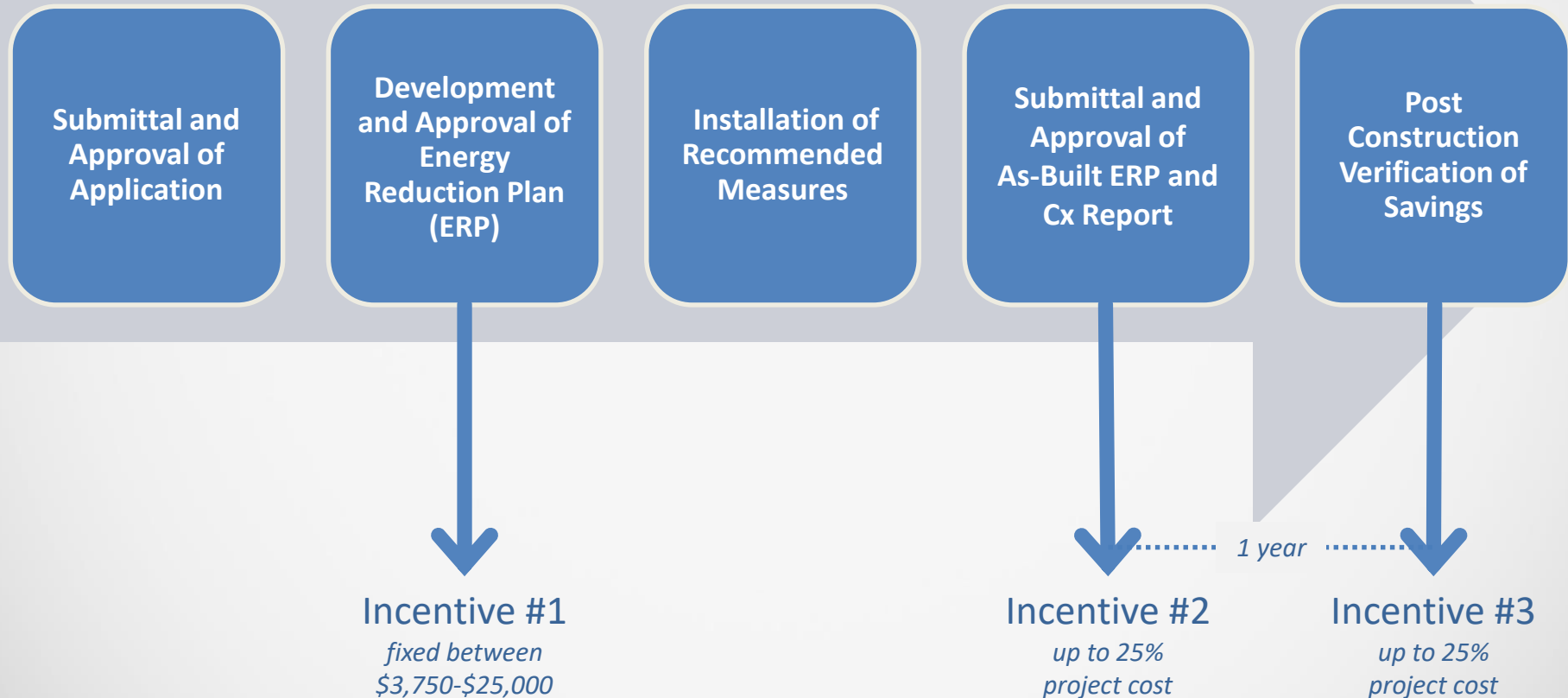
Pay for Performance: Overview



- Comprehensive, whole-building approach to saving energy in existing or new facilities
- Qualification based on energy consumption, energy savings and measure types
- Customer chooses from network of pre-approved ***Participating Partners***
- Incentives paid in three installments at milestones
 - Incentives up to \$2MM per project (\$4MM entity cap/year)
 - \$1 million for electric measures
 - \$1 million for gas measures
 - Incentives up to 50% of total project cost

www.NJCleanEnergy/P4P

Pay for Performance: Process



Pay for Performance: Details



Incentive #1: Energy Reduction Plan			
Incentive Amount:		\$0.15	per sq ft
Minimum Incentive:		\$3,750	
Maximum Incentive:		\$25,000	or 50% of facility annual energy cost
Incentive #2: Installation of Recommended Measures			
Minimum Performance Target:		15%	
Electric Incentives	Base Incentive based on 15% savings:	\$0.09	per projected kWh saved
	For each % over 15% add:	\$0.005	
	Maximum Incentive:	\$0.11	
Gas Incentives	Base Incentive based on 15 % savings:	\$0.90	per projected Therm saved
	For each % over 15% add:	\$0.05	
	Maximum Incentive:	\$1.25	
Incentive Cap:		25%	of total project cost
Incentive #3: Post-Construction Benchmarking Report			
Minimum Performance Target:		15%	
Electric Incentives	Base Incentive based on 15% savings:	\$0.09	per projected kWh saved
	For each % over 15% add:	\$0.005	
	Maximum Incentive:	\$0.11	
Gas Incentives	Base Incentive based on 15% savings:	\$0.90	per projected Therm saved
	For each % over 15% add:	\$0.05	
	Maximum Incentive:	\$1.25	
Incentive Cap:		25%	of total project cost

Direct Install: Overview



- Turn-key retrofit program to replace outdated and inefficient equipment, including lighting, HVAC, refrigeration, etc.
- Open to Small to Mid-Sized Commercial and Industrial facilities with an average electric demand ≤ 200 kW
- Provides incentives of up to 70% of the installed cost
- Incentives are paid directly to the contractor
 - Customer only pays remaining 30% of installed cost
 - \$125,000 project/building cap
 - \$250,000 per entity cap (up to \$500,000 if using ESIP)
- Participating contractors provide support and process all paperwork
- Fast turnaround time: Average length of time for job completion (4-6 months)

Direct Install:



Participating Contractor

Willdan Energy Solutions

Robert Vidaurre

908-337-8477

rvidaurre@willdan.com

SmartStart: Overview



- Two types of incentives for high efficiency equipment installation:
 - Prescriptive
 - Custom
- Project Categories:
 - New Construction
 - Renovation
 - Remodeling
 - Equipment Replacement
- Project pre-approval required for lighting and custom measures
- Incentives up to \$500,000 per electric account & \$500,000 per natural gas account
- Specific incentives and individual applications for Lighting, HVAC, VFDs, Refrigeration, Controls and more!

www.NJCleanEnergy/SSB

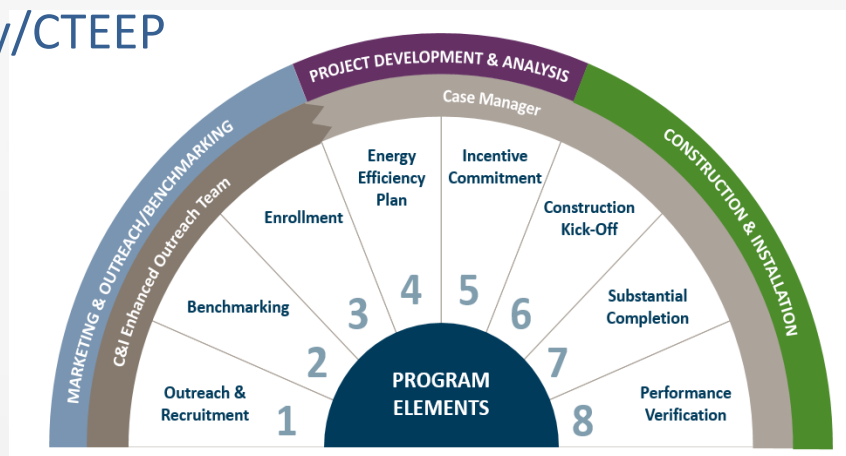
CTEEP: Overview



Customer Tailored Energy Efficiency Pilot (CTEEP)

- Provide customers with **on-site assistance** to discuss project opportunities and program incentives.
- A **single application** submission streamlines multiple prescriptive and custom measures.
- Provide **technical assistance incentives** to help offset soft costs associated with developing and planning an energy efficiency project.
- Incentives up to \$250,000 entity cap.

www.NJCleanEnergy.com/CTEEP



Recommended NJCEP Incentives per Building



Union Township Public Schools	Pay For Performance	Direct Install	SmartStart	CTEEP
Union High School			X	X
Burnett Middle School	X		X	X
Kawameeh Middle School		X	X	X
Jefferson Elementary School	X		X	X
Battle Hill Elementary School		X	X	X
Connecticut Farms School		X	X	X
Franklin Elementary School		X	X	X
Hannah Caldwell Elementary		X	X	X
Livingston Elementary School		X	X	X
Washington Elementary School		X	X	X
Hamilton Office		X	X	X
Field House		X	X	X
Administration Building		X	X	X

Energy Savings Improvement Program (ESIP)

- Provides alternative financing for energy savings projects at public institutions. Value of energy savings leveraged to pay for cost of EE projects over a 15 year contract. Does not count as debt/require voter approval.
- Requires an audit as 1st step (LGEA satisfies requirement)
- ESIP participation question on LGEA application
- Program administered directly by BPU

ESIP Process

New Jersey's Clean Energy Program Interaction

Initial Energy Audit completed
for entity building(s)

Local Government Energy Audit
(LGEA) may be used to meet
this requirement

Entity issues ESIP RFP (previously
approved by BPU) and selects ESCO
or DIY approach

Investment Grade Energy Audit completed
and Energy Savings Plan (ESP)
developed

P4P Energy Reduction Plan (ERP),
Direct Install, or SmartStart application
recommended submittal time frame

Third party review of ESP

Review and approval of ESP
by Board of Public Utilities (BPU)

Entity adopts ESP,
determines guarantee



FOR MORE INFORMATION

ESIP

Mike Thulen

ESIP Coordinator

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Cell: 732-330-2419

ESIP@bpu.nj.gov

Questions



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FOR MORE INFORMATION

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