New Jersey's Clean Energy Program

LGEA Exit Meeting for:

Piscataway Board of Education

February 17, 2020

INTRODUCTIONS

- *Piscataway BOE*
  - David Oliveira – Business Administrator/Board Secretary
  - Bill Griffith – Facilities Manager
- *NJ Clean Energy Program*
  - Aimee Lalonde – TRC Program Manager
  - Sarah Landis & Kush Patel – TRC Auditors
  - Sarah Walters – TRC Account Manager
  - Tony O'Donnell – TRC Outreach Account Manager

AGENDA

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

LGEA Process

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

Site Visit & Utility Analysis

Overview of Systems, Baseline & Existing Conditions:

- Lighting System
- HVAC and Mechanical Systems
- Plug Load Equipment
- Building Energy Management System

Utility Consumption:

- Electric Consumption and Costs
- Natural Gas Consumption and Costs

Sites Visited/Analyzed

- Piscataway High School
- Conackamack Middle School
- Quibbletown Middle School
- T. Schor Middle School
- Arbor Intermediate School
- MLK Intermediate School
- Eisenhower Elementary School
- Grandview Elementary School
- Knollwood Elementary School
- Randolphville Elementary School
- Fellowship Farms School
- Ethel Rd. Complex

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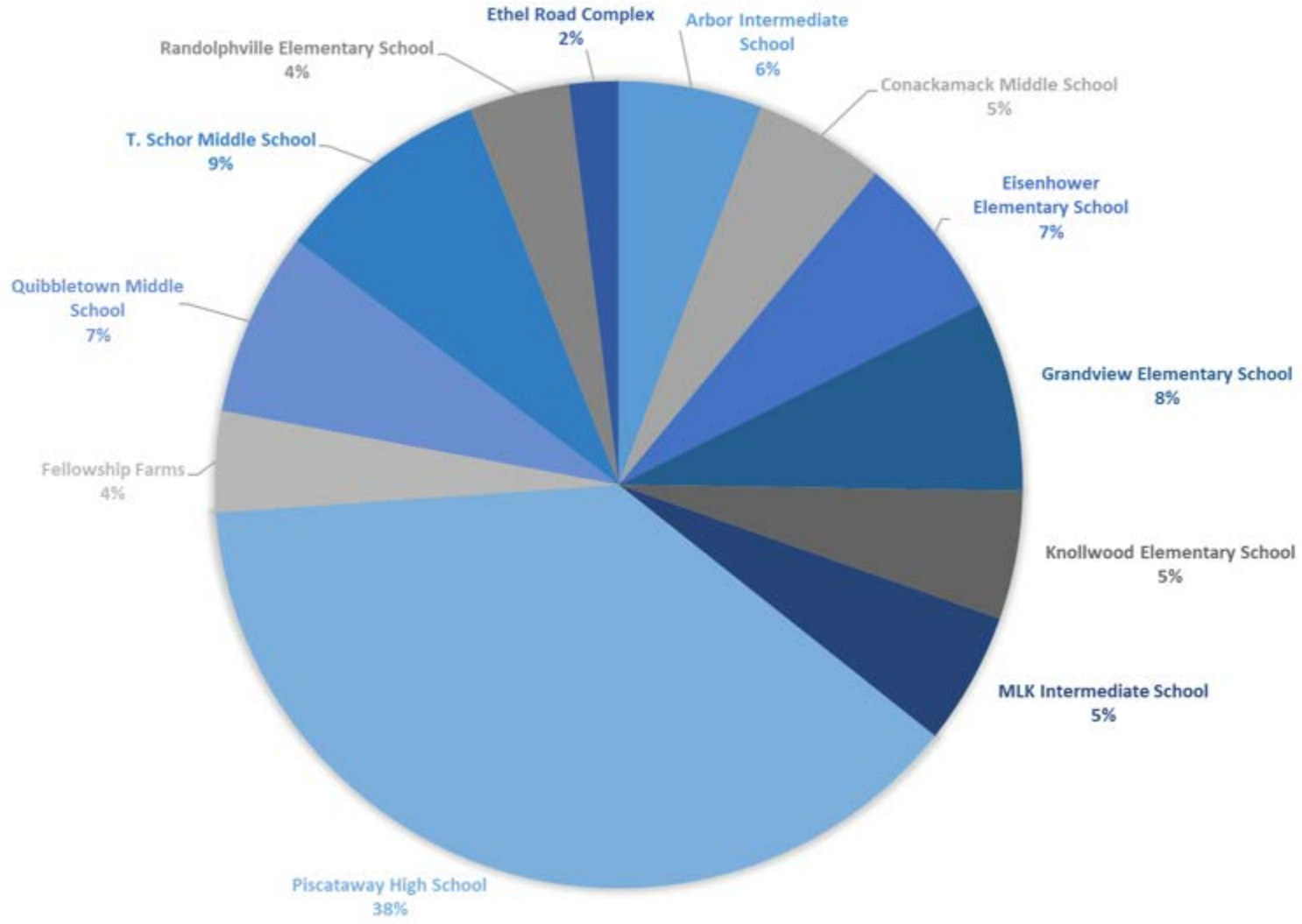
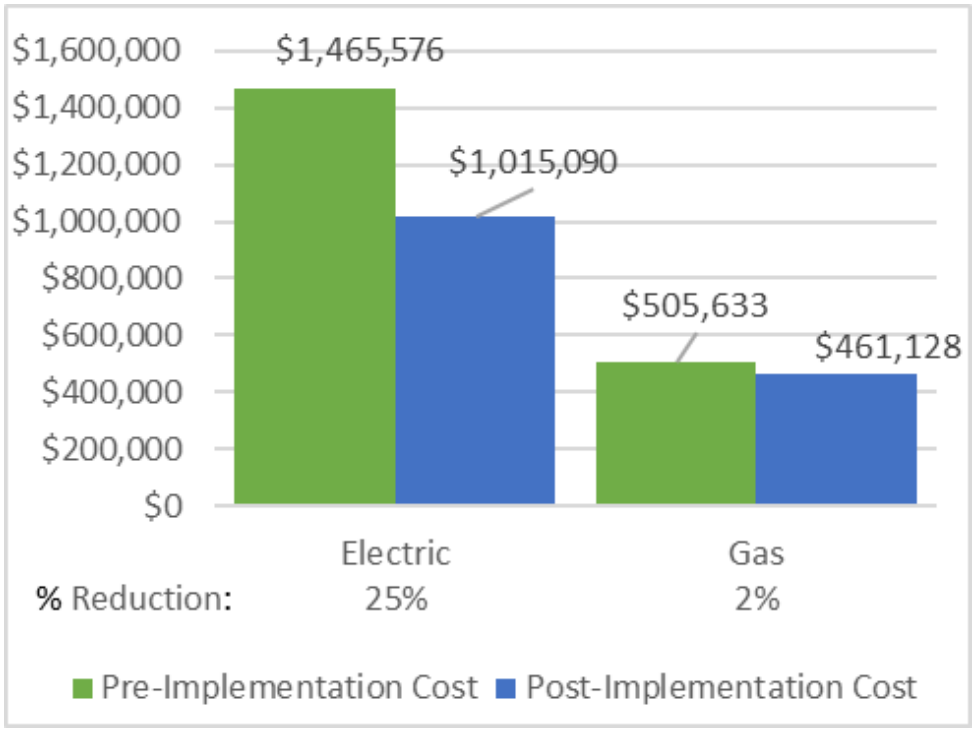
Utility Breakout

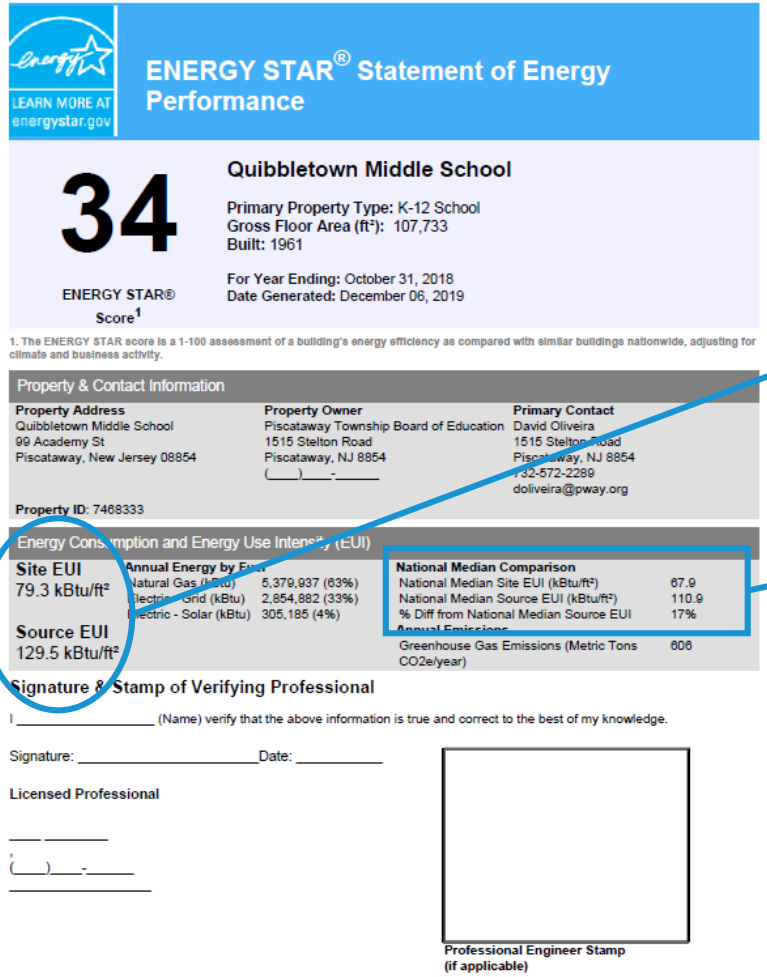
Percent of Total Annual Energy Costs



Utility Breakout



BENCHMARKING



ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

34

ENERGY STAR® Score[1]

Quibbletown Middle School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 107,733
Built: 1961

For Year Ending: October 31, 2018
Date Generated: December 06, 2019

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
Quibbletown Middle School 99 Academy St Piscataway, New Jersey 08854	Piscataway Township Board of Education 1515 Stelton Road Piscataway, NJ 8854 (___)___-____	David Oliveira 1515 Stelton Road Piscataway, NJ 8854 732-572-2289 doliveira@pway.org

Property ID: 7468333

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
79.3 kBtu/ft²

Source EUI
129.5 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	5,379,937 (63%)
Electric - Grid (kBtu)	2,854,882 (33%)
Electric - Solar (kBtu)	305,185 (4%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	67.9
National Median Source EUI (kBtu/ft²)	110.9
% Diff from National Median Source EUI	17%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	606

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

___ _____

(___)___-____

_____

Professional Engineer Stamp (if applicable)

Site EUI
79.3 kBtu/ft²

Source EUI
129.5 kBtu/ft²

National Median Comparison

National Median Site EUI (kBtu/ft²)	67.9
National Median Source EUI (kBtu/ft²)	110.9
% Diff from National Median Source EUI	17%

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.

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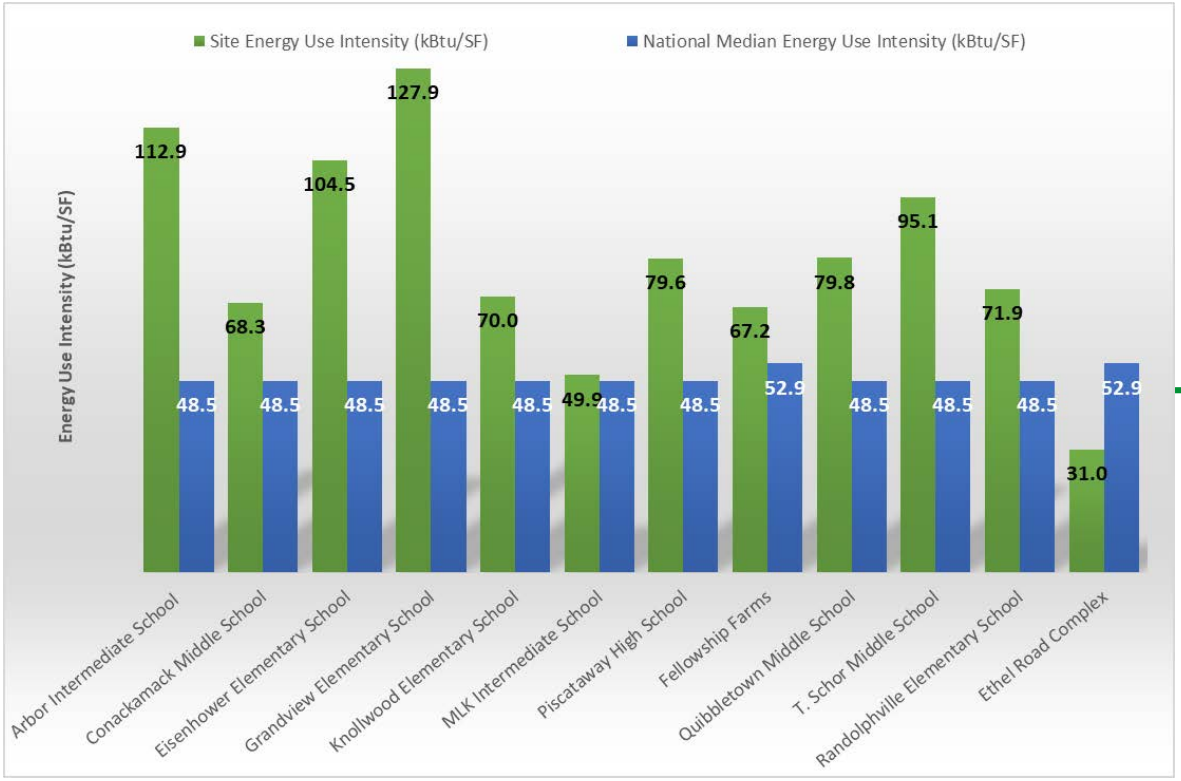
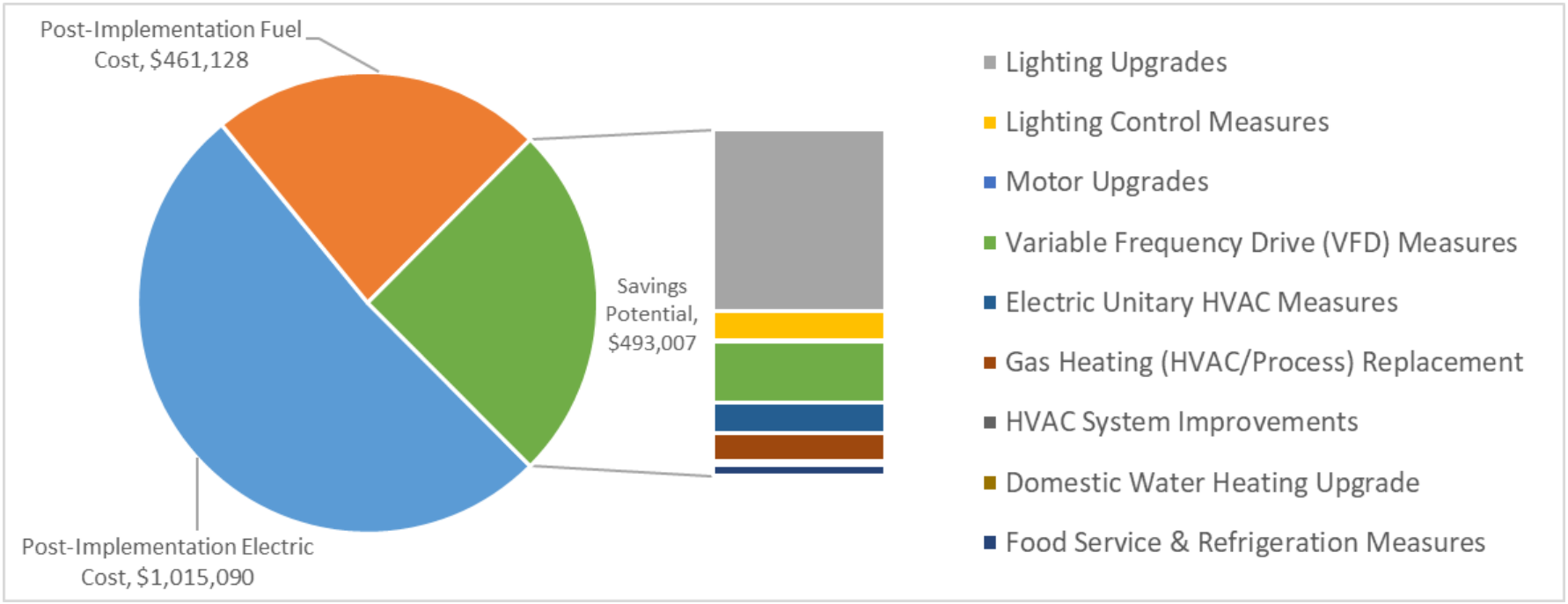
BENCHMARKING



Site Name	Energy Star Score
Piscataway High School	31
Conackamack Middle School	59
Quibbletown Middle School	34
T. Schor Middle School	21
Arbor Intermediate School	19
MLK Intermediate School	56
Eisenhower Elementary School	18
Grandview Elementary School	7
Knollwood Elementary School	51
Randolphville Elementary School	53
Fellowship Farms School	32
Ethel Rd. Complex	N/A

All Opportunities

Savings Potential



ALL OPPORTUNITIES

#	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_2e Emissions Reduction (lbs)
Lighting Upgrades		**2,241,409**	**436.2**	**-465.2**	**$258,295**	**$707,523**	**$358,714**	**$348,809**	**1.4**	**2,202,617**
ECM 1	Install LED Fixtures	57,038	5.1	-9.1	$6,169	$24,958	$5,930	$19,028	3.1	56,371
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	17,243	8.4	-3.8	$2,209	$17,205	$4,902	$12,303	5.6	16,919
ECM 3	Retrofit Fixtures with LED Lamps	2,163,620	422.4	-451.5	$249,533	$661,161	$347,882	$313,279	1.3	2,125,881
ECM 4	Install LED Exit Signs	3,508	0.3	-0.7	$383	$4,200	$0	$4,200	11.0	3,446
Lighting Control Measures		**381,464**	**52.4**	**-79.8**	**$42,256**	**$214,621**	**$79,455**	**$135,166**	**3.2**	**374,787**
ECM 5	Install Occupancy Sensor Lighting Controls	327,721	45.8	-68.6	$36,508	$171,871	$38,430	$133,441	3.7	321,985
ECM 6	Install High/Low Lighting Controls	53,743	6.5	-11.2	$5,748	$42,750	$41,025	$1,725	0.3	52,802
Motor Upgrades		**7,844**	**1.4**	**0.0**	**$902**	**$24,622**	**$0**	**$24,622**	**27.3**	**7,898**
ECM 7	Premium Efficiency Motors	7,844	1.4	0.0	$902	$24,622	$0	$24,622	27.3	7,898
Variable Frequency Drive (VFD) Measures		**733,376**	**153.5**	**0.0**	**$87,412**	**$1,098,922**	**$95,550**	**$1,003,372**	**11.5**	**738,503**
ECM 8	Install VFDs on Constant Volume (CV) Fans	394,390	103.3	0.0	$50,311	$610,530	$55,550	$554,980	11.0	397,147
ECM 9	Install VFDs on Chilled Water Pumps	161,216	33.5	0.0	$17,395	$242,627	$22,000	$220,627	12.7	162,343
ECM 10	Install VFDs on Heating Water Pumps	177,770	16.8	0.0	$19,706	$245,766	$18,000	$227,766	11.6	179,013
Electric Unitary HVAC Measures		**359,310**	**275.3**	**0.0**	**$44,168**	**$2,924,096**	**$249,601**	**$2,674,495**	**60.6**	**361,822**
ECM 11	Install High Efficiency Air Conditioning Units	314,592	271.0	0.0	$38,422	$2,880,857	$246,330	$2,634,527	68.6	316,792
ECM 12	Install High Efficiency Heat Pumps	41,357	3.0	0.0	$5,375	$27,500	$2,202	$25,297	4.7	41,646
ECM 13	Install High Efficiency PTAC/PTHP	3,361	1.3	0.0	$370	$15,740	$1,069	$14,671	39.6	3,384

ALL OPPORTUNITIES

#	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_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**4,281.4**	**$39,208**	**$749,979**	**$231,533**	**$518,447**	**13.2**	**501,302**
ECM 14	Install High Efficiency Hot Water Boilers	0	0.0	123.6	$1,149	$97,680	$17,533	$80,147	69.8	14,469
ECM 15	Install High Efficiency Furnaces	0	0.0	4,133.9	$37,820	$649,475	$212,000	$437,475	11.6	484,023
ECM 16	Install Infrared Heaters	0	0.0	24.0	$239	$2,824	$2,000	$824	3.4	2,810
HVAC System Improvements		**7,024**	**0.0**	**222.4**	**$3,002**	**$31,573**	**$50**	**$31,523**	**10.5**	**33,119**
ECM 17	Install Programmable Thermostats	0	0.0	98.3	$979	$4,288	$0	$4,288	4.4	11,512
ECM 18	Implement Demand Control Ventilation (DCV)	7,024	0.0	114.6	$1,932	$27,188	$0	$27,188	14.1	20,486
ECM 19	Install Pipe Insulation	0	0.0	9.6	$91	$97	$50	$47	0.5	1,120
Domestic Water Heating Upgrade		**8,202**	**0.0**	**169.4**	**$2,435**	**$15,368**	**$3,737**	**$11,632**	**4.8**	**28,095**
ECM 20	Install High Efficiency Gas-Fired Water Heater	0	0.0	14.1	$134	$13,124	$1,505	$11,619	86.7	1,650
ECM 21	Install Low-Flow DHW Devices	8,202	0.0	155.3	$2,301	$2,244	$2,232	$13	0.0	26,445
Food Service & Refrigeration Measures		**73,803**	**8.3**	**703.1**	**$15,331**	**$113,599**	**$29,310**	**$84,289**	**5.5**	**156,644**
ECM 22	Food Service Equipment Replacement	0	0.0	703.1	$6,211	$56,903	$24,000	$32,903	5.3	82,325
ECM 23	Refrigerator/Freezer Case Electrically Commutated Motors	2,562	0.2	0.0	$300	$2,123	$560	$1,563	5.2	2,580
ECM 24	Replace Refrigeration Equipment	49,502	5.7	0.0	$6,182	$50,204	$3,550	$46,654	7.5	49,848
ECM 25	Vending Machine Control	21,740	2.5	0.0	$2,638	$4,370	$1,200	$3,170	1.2	21,892
TOTALS		**3,812,431**	**927.2**	**4,831.4**	**$493,008**	**$5,880,305**	**$1,047,949**	**$4,832,356**	**9.8**	**4,404,788**

* - 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.

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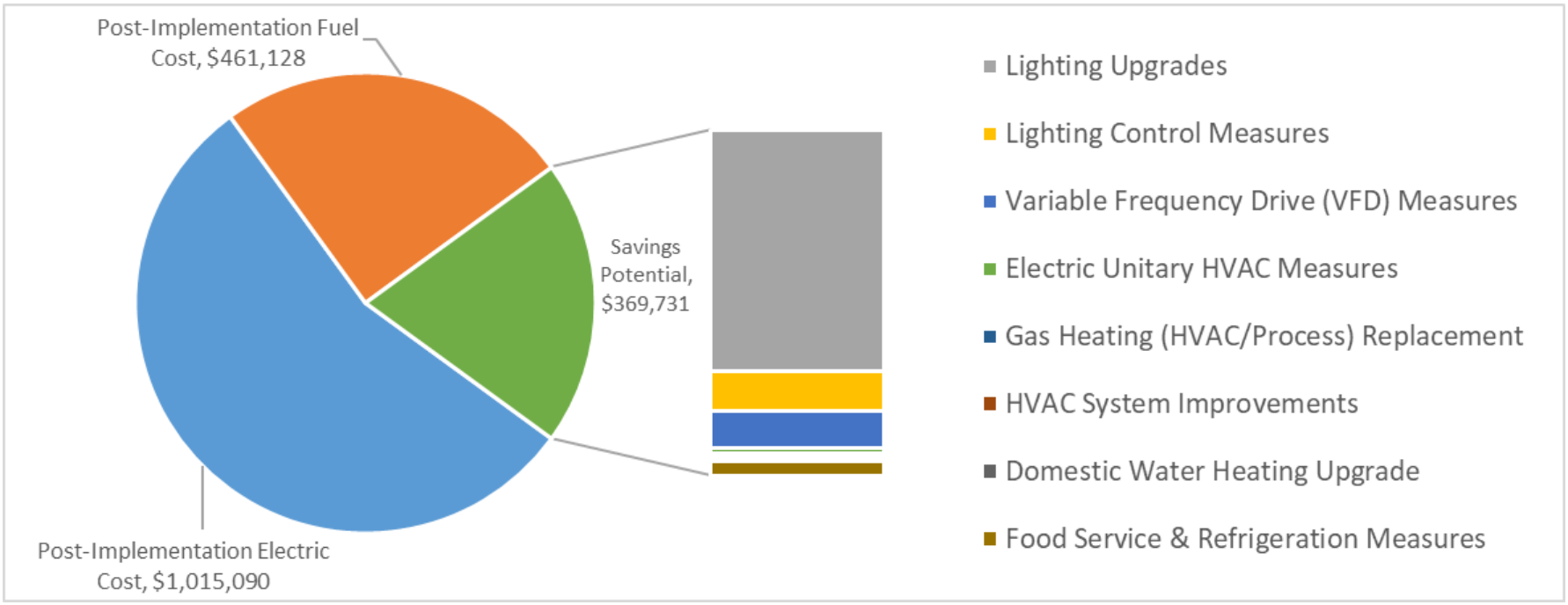
Cost Effective Opportunities

Savings Potential



Cost Effective Opportunities

#	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_2e Emissions Reduction (lbs)
Lighting Upgrades		**2,241,409**	**436.2**	**-465.2**	**$258,295**	**$707,523**	**$358,714**	**$348,809**	**1.4**	**2,202,617**
ECM 1	Install LED Fixtures	57,038	5.1	-9.1	$6,169	$24,958	$5,930	$19,028	3.1	56,371
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	17,243	8.4	-3.8	$2,209	$17,205	$4,902	$12,303	5.6	16,919
ECM 3	Retrofit Fixtures with LED Lamps	2,163,620	422.4	-451.5	$249,533	$661,161	$347,882	$313,279	1.3	2,125,881
ECM 4	Install LED Exit Signs	3,508	0.3	-0.7	$383	$4,200	$0	$4,200	11.0	3,446
Lighting Control Measures		**381,318**	**52.3**	**-79.8**	**$42,237**	**$214,171**	**$79,455**	**$134,716**	**3.2**	**374,644**
ECM 5	Install Occupancy Sensor Lighting Controls	327,721	45.8	-68.6	$36,508	$171,871	$38,430	$133,441	3.7	321,985
ECM 6	Install High/Low Lighting Controls	53,597	6.5	-11.2	$5,730	$42,300	$41,025	$1,275	0.2	52,659
Variable Frequency Drive (VFD) Measures		**324,387**	**84.4**	**0.0**	**$39,786**	**$436,171**	**$43,800**	**$392,371**	**9.9**	**326,655**
ECM 8	Install VFDs on Constant Volume (CV) Fans	297,382	80.4	0.0	$36,622	$416,391	$43,800	$372,591	10.2	299,461
ECM 10	Install VFDs on Heating Water Pumps	27,005	4.0	0.0	$3,164	$19,779	$0	$19,779	6.3	27,194
Electric Unitary HVAC Measures		**43,482**	**2.8**	**0.0**	**$5,585**	**$26,237**	**$2,085**	**$24,152**	**4.3**	**43,786**
ECM 12	Install High Efficiency Heat Pumps	40,986	2.6	0.0	$5,327	$23,901	$1,926	$21,975	4.1	41,273
ECM 13	Install High Efficiency PTAC/PTHP	2,496	0.3	0.0	$258	$2,336	$159	$2,177	8.4	2,513

Cost Effective Opportunities

#	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_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**367.0**	**$3,610**	**$45,330**	**$12,400**	**$32,930**	**9.1**	**42,970**
ECM 15	Install High Efficiency Furnaces	0	0.0	343.0	$3,371	$42,505	$10,400	$32,105	9.5	40,160
ECM 16	Install Infrared Heaters	0	0.0	24.0	$239	$2,824	$2,000	$824	3.4	2,810
HVAC System Improvements		**5,330**	**0.0**	**202.2**	**$2,587**	**$17,979**	**$50**	**$17,929**	**6.9**	**29,048**
ECM 17	Install Programmable Thermostats	0	0.0	98.3	$979	$4,288	$0	$4,288	4.4	11,512
ECM 18	Implement Demand Control Ventilation (DCV)	5,330	0.0	94.4	$1,516	$13,594	$0	$13,594	9.0	16,415
ECM 19	Install Pipe Insulation	0	0.0	9.6	$91	$97	$50	$47	0.5	1,120
Domestic Water Heating Upgrade		**8,202**	**0.0**	**155.3**	**$2,301**	**$2,244**	**$2,232**	**$13**	**0.0**	**26,445**
ECM 21	Install Low-Flow DHW Devices	8,202	0.0	155.3	$2,301	$2,244	$2,232	$13	0.0	26,445
Food Service & Refrigeration Measures		**73,803**	**8.3**	**703.1**	**$15,331**	**$113,599**	**$29,310**	**$84,289**	**5.5**	**156,644**
ECM 22	Food Service Equipment Replacement	0	0.0	703.1	$6,211	$56,903	$24,000	$32,903	5.3	82,325
ECM 23	Refrigerator/Freezer Case Electrically Commutated Motors	2,562	0.2	0.0	$300	$2,123	$560	$1,563	5.2	2,580
ECM 24	Replace Refrigeration Equipment	49,502	5.7	0.0	$6,182	$50,204	$3,550	$46,654	7.5	49,848
ECM 25	Vending Machine Control	21,740	2.5	0.0	$2,638	$4,370	$1,200	$3,170	1.2	21,892
TOTALS		**3,077,932**	**584.2**	**882.7**	**$369,732**	**$1,563,254**	**$528,046**	**$1,035,208**	**2.8**	**3,202,810**

* - 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.

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PISCATAWAY HIGH SCHOOL

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			**1,163,920**	**161.0**	**-243**	**$123,435**	**$260,166**	**$132,334**	**$127,832**	**1.0**	**1,143,563**
ECM 1	Install LED Fixtures	Yes	43,258	5.1	-9	$4,588	$6,239	$420	$5,819	1.3	42,502
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	2,174	1.0	0	$231	$1,747	$480	$1,267	5.5	2,136
ECM 3	Retrofit Fixtures with LED Lamps	Yes	1,115,366	154.7	-233	$118,285	$248,270	$131,434	$116,836	1.0	1,095,858
ECM 4	Install LED Exit Signs	Yes	3,122	0.2	-1	$331	$3,910	$0	$3,910	11.8	3,067
Lighting Control Measures			**295,940**	**34.7**	**-62**	**$31,385**	**$142,535**	**$62,240**	**$80,295**	**2.6**	**290,764**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	244,959	28.7	-51	$25,978	$103,160	$23,730	$79,430	3.1	240,675
ECM 6	Install High/Low Lighting Controls	Yes	50,980	6.0	-11	$5,407	$39,375	$38,510	$865	0.2	50,089
Motor Upgrades			**4,498**	**0.6**	**0**	**$485**	**$14,242**	**$0**	**$14,242**	**29.3**	**4,530**
ECM 7	Premium Efficiency Motors	No	4,498	0.6	0	$485	$14,242	$0	$14,242	29.3	4,530
Variable Frequency Drive (VFD) Measures			**298,682**	**44.7**	**0**	**$32,227**	**$421,912**	**$38,000**	**$383,912**	**11.9**	**300,770**
ECM 8	Install VFDs on Chilled Water Pumps	No	161,216	33.5	0	$17,395	$242,627	$22,000	$220,627	12.7	162,343
ECM 9	Install VFDs on Heating Water Pumps	No	137,466	11.2	0	$14,832	$179,286	$16,000	$163,286	11.0	138,427
Electric Unitary HVAC Measures			**28,624**	**17.9**	**0**	**$3,088**	**$267,288**	**$24,288**	**$243,000**	**78.7**	**28,824**
ECM 10	Install High Efficiency Air Conditioning Units	No	28,624	17.9	0	$3,088	$267,288	$24,288	$243,000	78.7	28,824
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**380**	**$3,355**	**$103,530**	**$24,706**	**$78,824**	**23.5**	**44,475**
ECM 11	Install High Efficiency Hot Water Boilers	No	0	0.0	49	$434	$30,845	$7,106	$23,739	54.8	5,747
ECM 12	Install High Efficiency Furnaces	No	0	0.0	331	$2,922	$72,685	$17,600	$55,085	18.9	38,728
Food Service & Refrigeration Measures			**10,726**	**1.2**	**703**	**$7,368**	**$59,956**	**$24,820**	**$35,136**	**4.8**	**93,126**
ECM 13	Food Service Equipment Replacement	Yes	0	0.0	703	$6,211	$56,903	$24,000	$32,903	5.3	82,325
ECM 14	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,639	0.1	0	$177	$1,213	$320	$893	5.0	1,651
ECM 15	Vending Machine Control	Yes	9,087	1.0	0	$980	$1,840	$500	$1,340	1.4	9,150
TOTALS (COST EFFECTIVE MEASURES)			**1,470,585**	**196.8**	**398**	**$162,188**	**$462,657**	**$219,394**	**$243,263**	**1.5**	**1,527,452**
TOTALS (ALL MEASURES)			**1,802,390**	**260.0**	**778**	**$201,344**	**$1,269,630**	**$306,388**	**$963,242**	**4.8**	**1,906,052**

CONACKAMACK MIDDLE SCHOOL

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			95,185	24.0	-20	$12,192	$40,197	$20,476	$19,721	1.6	93,521
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	312	0.1	0	$40	$119	$30	$89	2.2	307
ECM 2	Retrofit Fixtures with LED Lamps	Yes	94,873	24.0	-20	$12,152	$40,078	$20,446	$19,632	1.6	93,214
Lighting Control Measures			10,847	2.3	-2	$1,389	$13,410	$2,800	$10,610	7.6	10,658
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	10,702	2.3	-2	$1,371	$12,960	$2,800	$10,160	7.4	10,515
ECM 4	Install High/Low Lighting Controls	No	146	0.0	0	$19	$450	$0	$450	24.1	143
Variable Frequency Drive (VFD) Measures			108,168	34.2	0	$14,072	$153,108	$17,600	$135,508	9.6	108,924
ECM 5	Install VFDs on Constant Volume (CV) Fans	Yes	95,419	32.6	0	$12,414	$143,632	$17,600	$126,032	10.2	96,087
ECM 6	Install VFDs on Heating Water Pumps	Yes	12,749	1.6	0	$1,659	$9,476	$0	$9,476	5.7	12,838
Electric Unitary HVAC Measures			16,854	29.9	0	$2,193	$462,426	$40,615	$421,811	192.4	16,972
ECM 7	Install High Efficiency Air Conditioning Units	No	15,619	28.4	0	$2,032	$445,424	$39,429	$405,995	199.8	15,728
ECM 8	Install High Efficiency Heat Pumps	No	370	0.5	0	$48	$3,599	$276	$3,323	69.0	373
ECM 9	Install High Efficiency PTAC/PTHP	No	865	1.0	0	$113	$13,404	$910	$12,494	111.0	871
Gas Heating (HVAC/Process) Replacement			0	0.0	222	$2,141	$101,890	$32,000	$69,890	32.7	26,011
ECM 10	Install High Efficiency Furnaces	No	0	0.0	222	$2,141	$101,890	$32,000	$69,890	32.7	26,011
HVAC System Improvements			546	0.0	4	$110	$2,719	$0	$2,719	24.7	1,026
ECM 11	Implement Demand Control Ventilation (DCV)	No	546	0.0	4	$110	$2,719	$0	$2,719	24.7	1,026
Domestic Water Heating Upgrade			0	0.0	6	$55	$43	$43	$0	0.0	667
ECM 12	Install Low-Flow DHW Devices	Yes	0	0.0	6	$55	$43	$43	$0	0.0	667
TOTALS (COST EFFECTIVE MEASURES)			214,055	60.5	-16	$27,690	$206,308	$40,919	$165,389	6.0	213,626
TOTALS (ALL MEASURES)			231,601	90.4	210	$32,152	$773,793	$113,534	$660,259	20.5	257,778

QUIBBLETOWN MIDDLE SCHOOL

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			163,512	36.1	-32	$16,989	$73,326	$33,884	$39,442	2.3	160,944
ECM 1	Install LED Fixtures	Yes	9,701	0.0	0	$1,024	$15,314	$3,200	$12,114	11.8	9,769
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	49	0.0	0	$5	$69	$20	$49	9.7	48
ECM 3	Retrofit Fixtures with LED Lamps	Yes	153,762	36.1	-32	$15,960	$57,943	$30,664	$27,279	1.7	151,128
Lighting Control Measures			10,804	2.1	-2	$1,121	$6,705	$1,680	$5,025	4.5	10,615
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	10,304	2.0	-2	$1,069	$6,480	$1,680	$4,800	4.5	10,123
ECM 5	Install High/Low Lighting Controls	Yes	501	0.1	0	$52	$225	$0	$225	4.3	492
Motor Upgrades			260	0.1	0	$27	$1,753	$0	$1,753	63.8	262
ECM 6	Premium Efficiency Motors	No	260	0.1	0	$27	$1,753	$0	$1,753	63.8	262
Variable Frequency Drive (VFD) Measures			116,649	24.7	0	$12,319	$141,380	$12,000	$129,380	10.5	117,464
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	102,392	22.3	0	$10,813	$131,077	$12,000	$119,077	11.0	103,108
ECM 8	Install VFDs on Heating Water Pumps	Yes	14,257	2.4	0	$1,506	$10,303	$0	$10,303	6.8	14,357
Electric Unitary HVAC Measures			32,586	21.7	0	$3,441	$343,890	$27,932	$315,958	91.8	32,814
ECM 9	Install High Efficiency Air Conditioning Units	No	32,586	21.7	0	$3,441	$343,890	$27,932	$315,958	91.8	32,814
Gas Heating (HVAC/Process) Replacement			0	0.0	298	$2,617	$102,201	$28,800	$73,401	28.1	34,863
ECM 10	Install High Efficiency Furnaces	No	0	0.0	298	$2,617	$102,201	$28,800	$73,401	28.1	34,863
HVAC System Improvements			1,782	0.0	28	$430	$2,719	$0	$2,719	6.3	5,015
ECM 11	Implement Demand Control Ventilation (DCV)	Yes	1,782	0.0	28	$430	$2,719	$0	$2,719	6.3	5,015
Domestic Water Heating Upgrade			0	0.0	3	$29	$43	$43	$0	0.0	392
ECM 12	Install Low-Flow DHW Devices	Yes	0	0.0	3	$29	$43	$43	$0	0.0	392
Food Service & Refrigeration Measures			343	0.0	0	$36	$230	$0	$230	6.4	345
ECM 13	Vending Machine Control	Yes	343	0.0	0	$36	$230	$0	$230	6.4	345
TOTALS (COST EFFECTIVE MEASURES)			293,089	63.0	-3	$30,924	$224,402	$47,607	$176,795	5.7	294,775
TOTALS (ALL MEASURES)			325,936	84.8	295	$37,010	$672,246	$104,339	$567,907	15.3	362,715

T. SCHOR MIDDLE SCHOOL

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			**147,404**	**36.0**	**-31**	**$19,392**	**$57,471**	**$29,450**	**$28,021**	**1.4**	**144,826**
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	2,015	1.6	0	$265	$2,674	$760	$1,914	7.2	1,980
ECM 2	Retrofit Fixtures with LED Lamps	Yes	145,389	34.4	-30	$19,127	$54,798	$28,690	$26,108	1.4	142,846
Lighting Control Measures			**9,793**	**1.6**	**-2**	**$1,288**	**$5,940**	**$1,470**	**$4,470**	**3.5**	**9,621**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	9,793	1.6	-2	$1,288	$5,940	$1,470	$4,470	3.5	9,621
Electric Unitary HVAC Measures			**17,366**	**13.3**	**0**	**$2,320**	**$182,409**	**$17,652**	**$164,757**	**71.0**	**17,487**
ECM 4	Install High Efficiency Air Conditioning Units	No	13,010	13.0	0	$1,738	$179,501	$17,336	$162,165	93.3	13,100
ECM 5	Install High Efficiency Heat Pumps	Yes	4,356	0.3	0	$582	$2,908	$316	$2,592	4.5	4,387
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**166**	**$1,624**	**$22,657**	**$4,000**	**$18,657**	**11.5**	**19,412**
ECM 6	Install High Efficiency Furnaces	Yes	0	0.0	166	$1,624	$22,657	$4,000	$18,657	11.5	19,412
HVAC System Improvements			**0**	**0.0**	**5**	**$47**	**$43**	**$24**	**$19**	**0.4**	**557**
ECM 7	Install Pipe Insulation	Yes	0	0.0	5	$47	$43	$24	$19	0.4	557
Domestic Water Heating Upgrade			**0**	**0.0**	**12**	**$116**	**$179**	**$179**	**$0**	**0.0**	**1,389**
ECM 8	Install Low-Flow DHW Devices	Yes	0	0.0	12	$116	$179	$179	$0	0.0	1,389
Food Service & Refrigeration Measures			**9,339**	**1.0**	**0**	**$1,248**	**$6,624**	**$340**	**$6,284**	**5.0**	**9,404**
ECM 9	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	923	0.1	0	$123	$910	$240	$670	5.4	929
ECM 10	Replace Refrigeration Equipment	Yes	6,804	0.8	0	$909	$5,484	$0	$5,484	6.0	6,852
ECM 11	Vending Machine Control	Yes	1,612	0.2	0	$215	$230	$100	$130	0.6	1,623
TOTALS (COST EFFECTIVE MEASURES)			**170,892**	**38.9**	**150**	**$24,297**	**$95,823**	**$35,780**	**$60,044**	**2.5**	**189,595**
TOTALS (ALL MEASURES)			**183,901**	**51.9**	**150**	**$26,035**	**$275,324**	**$53,116**	**$222,208**	**8.5**	**202,696**

BPU New Jersey's cleanenergy program™

ARBOR INTERMEDIATE SCHOOL

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			88,011	25.6	-18	$8,932	$41,813	$21,978	$19,835	2.2	86,471
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	1,035	0.2	0	$105	$344	$100	$244	2.3	1,017
ECM 2	Retrofit Fixtures with LED Lamps	Yes	86,976	25.4	-18	$8,827	$41,469	$21,878	$19,591	2.2	85,454
Lighting Control Measures			2,526	0.5	-1	$256	$2,970	$420	$2,550	9.9	2,482
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	2,526	0.5	-1	$256	$2,970	$420	$2,550	9.9	2,482
Motor Upgrades			574	0.1	0	$59	$1,896	$0	$1,896	32.0	578
ECM 4	Premium Efficiency Motors	No	574	0.1	0	$59	$1,896	$0	$1,896	32.0	578
Variable Frequency Drive (VFD) Measures			3,699	0.4	0	$382	$7,246	$400	$6,846	17.9	3,725
ECM 5	Install VFDs on Heating Water Pumps	No	3,699	0.4	0	$382	$7,246	$400	$6,846	17.9	3,725
Electric Unitary HVAC Measures			63,770	38.8	0	$6,588	$322,435	$27,760	$294,676	44.7	64,216
ECM 6	Install High Efficiency Air Conditioning Units	No	61,274	38.5	0	$6,331	$320,099	$27,601	$292,498	46.2	61,702
ECM 7	Install High Efficiency PTAC/PTHP	Yes	2,496	0.3	0	$258	$2,336	$159	$2,177	8.4	2,513
Gas Heating (HVAC/Process) Replacement			0	0.0	928	$8,100	$76,198	$28,800	$47,398	5.9	108,639
ECM 8	Install High Efficiency Furnaces	No	0	0.0	928	$8,100	$76,198	$28,800	$47,398	5.9	108,639
Domestic Water Heating Upgrade			8,202	0.0	9	$926	$416	$416	$0	0.0	9,315
ECM 9	Install Low-Flow DHW Devices	Yes	8,202	0.0	9	$926	$416	$416	$0	0.0	9,315
Food Service & Refrigeration Measures			14,946	1.7	0	$1,544	$13,867	$1,400	$12,467	8.1	15,051
ECM 10	Replace Refrigeration Equipment	Yes	13,335	1.5	0	$1,378	$13,637	$1,300	$12,337	9.0	13,428
ECM 11	Vending Machine Control	Yes	1,612	0.2	0	$167	$230	$100	$130	0.8	1,623
TOTALS (COST EFFECTIVE MEASURES)			116,181	28.1	-10	$11,917	$61,402	$24,372	$37,029	3.1	115,833
TOTALS (ALL MEASURES)			181,728	67.2	918	$26,789	$466,841	$81,173	$385,668	14.4	290,477

MLK Intermediate School

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			106,304	30.0	-22	$14,045	$42,541	$22,736	$19,805	1.4	104,451
ECM 1	Install LED Fixtures	Yes	221	0.0	0	$30	$70	$70	$0	0.0	222
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	401	0.2	0	$53	$394	$110	$284	5.4	394
ECM 3	Retrofit Fixtures with LED Lamps	Yes	105,683	29.7	-22	$13,962	$42,077	$22,556	$19,521	1.4	103,834
Lighting Control Measures			5,813	1.3	-1	$768	$5,895	$1,190	$4,705	6.1	5,711
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	5,749	1.3	-1	$760	$5,670	$1,050	$4,620	6.1	5,649
ECM 5	Install High/Low Lighting Controls	Yes	63	0.0	0	$8	$225	$140	$85	10.2	62
Motor Upgrades			1,787	0.4	0	$239	$4,612	$0	$4,612	19.3	1,799
ECM 6	Premium Efficiency Motors	No	1,787	0.4	0	$239	$4,612	$0	$4,612	19.3	1,799
Variable Frequency Drive (VFD) Measures			61,218	14.2	0	$8,206	$120,069	$6,500	$113,569	13.8	61,646
ECM 7	Install VFDs on Constant Volume (CV) Fans	No	61,218	14.2	0	$8,206	$120,069	$6,500	$113,569	13.8	61,646
Electric Unitary HVAC Measures			36,063	53.9	0	$4,834	$466,171	$38,914	$427,257	88.4	36,315
ECM 8	Install High Efficiency Air Conditioning Units	No	36,063	53.9	0	$4,834	$466,171	$38,914	$427,257	88.4	36,315
Gas Heating (HVAC/Process) Replacement			0	0.0	257	$2,371	$87,760	$36,800	$50,960	21.5	30,071
ECM 9	Install High Efficiency Furnaces	No	0	0.0	257	$2,371	$87,760	$36,800	$50,960	21.5	30,071
HVAC System Improvements			928	0.0	11	$229	$8,157	$0	$8,157	35.5	2,267
ECM 10	Implement Demand Control Ventilation (DCV)	No	928	0.0	11	$229	$8,157	$0	$8,157	35.5	2,267
Domestic Water Heating Upgrade			0	0.0	41	$382	$11,895	$1,781	$10,114	26.5	4,848
ECM 11	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	10	$90	$11,500	$1,393	$10,107	111.9	1,146
ECM 12	Install Low-Flow DHW Devices	Yes	0	0.0	32	$292	$394	$388	$6	0.0	3,703
Food Service & Refrigeration Measures			8,962	1.0	0	$1,201	$9,098	$400	$8,698	7.2	9,025
ECM 13	Replace Refrigeration Equipment	Yes	7,008	0.8	0	$939	$8,638	$300	$8,338	8.9	7,057
ECM 14	Vending Machine Control	Yes	1,954	0.2	0	$262	$460	$100	$360	1.4	1,968
TOTALS (COST EFFECTIVE MEASURES)			121,079	32.3	8	$16,306	$57,929	$24,714	$33,215	2.0	122,889
TOTALS (ALL MEASURES)			221,074	100.8	286	$32,276	$756,197	$108,321	$647,876	20.1	256,133

EISENHOWER ELEMENTARY SCHOOL

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			78,587	22.5	-16	$10,111	$33,908	$17,644	$16,264	1.6	77,212
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	1,299	0.3	0	$167	$754	$142	$612	3.7	1,276
ECM 2	Retrofit Fixtures with LED Lamps	Yes	77,288	22.2	-16	$9,944	$33,154	$17,502	$15,652	1.6	75,936
Lighting Control Measures			3,413	0.8	-1	$439	$2,970	$560	$2,410	5.5	3,354
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	3,413	0.8	-1	$439	$2,970	$560	$2,410	5.5	3,354
Variable Frequency Drive (VFD) Measures			22,640	5.5	0	$2,956	$26,314	$3,400	$22,914	7.8	22,799
ECM 4	Install VFDs on Constant Volume (CV) Fans	Yes	22,640	5.5	0	$2,956	$26,314	$3,400	$22,914	7.8	22,799
Electric Unitary HVAC Measures			81,872	55.1	0	$10,690	$412,730	$35,102	$377,628	35.3	82,444
ECM 5	Install High Efficiency Air Conditioning Units	No	81,872	55.1	0	$10,690	$412,730	$35,102	$377,628	35.3	82,444
Gas Heating (HVAC/Process) Replacement			0	0.0	1,177	$10,751	$75,947	$32,000	$43,947	4.1	137,813
ECM 6	Install High Efficiency Furnaces	No	0	0.0	1,177	$10,751	$75,947	$32,000	$43,947	4.1	137,813
HVAC System Improvements			2,060	0.0	57	$788	$8,193	$20	$8,173	10.4	8,732
ECM 7	Implement Demand Control Ventilation (DCV)	Yes	2,060	0.0	53	$752	$8,157	$0	$8,157	10.8	8,268
ECM 8	Install Pipe Insulation	Yes	0	0.0	4	$36	$36	$20	$16	0.4	464
Domestic Water Heating Upgrade			0	0.0	29	$269	$337	$337	$0	0.0	3,444
ECM 9	Install Low-Flow DHW Devices	Yes	0	0.0	29	$269	$337	$337	$0	0.0	3,444
Food Service & Refrigeration Measures			6,964	0.8	0	$909	$6,276	$1,300	$4,976	5.5	7,013
ECM 10	Replace Refrigeration Equipment	Yes	5,010	0.6	0	$654	$5,816	$1,200	$4,616	7.1	5,045
ECM 11	Vending Machine Control	Yes	1,954	0.2	0	$255	$460	$100	$360	1.4	1,968
TOTALS (COST EFFECTIVE MEASURES)			113,665	29.6	69	$15,473	$77,998	$23,261	$54,737	3.5	122,553
TOTALS (ALL MEASURES)			195,536	84.7	1,246	$36,914	$566,675	$90,363	$476,312	12.9	342,811

GRANDVIEW ELEMENTARY SCHOOL

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			**111,750**	**25.3**	**-22**	**$15,086**	**$40,904**	**$21,826**	**$19,078**	**1.3**	**109,942**
ECM 1	Install LED Fixtures	Yes	1,533	0.0	0	$210	$588	$400	$188	0.9	1,544
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	245	0.0	0	$33	$69	$20	$49	1.5	240
ECM 3	Retrofit Fixtures with LED Lamps	Yes	109,587	25.3	-22	$14,791	$39,957	$21,406	$18,551	1.3	107,779
ECM 4	Install LED Exit Signs	Yes	385	0.0	0	$52	$290	$0	$290	5.6	379
Lighting Control Measures			**6,742**	**1.2**	**-1**	**$909**	**$4,706**	**$910**	**$3,796**	**4.2**	**6,624**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	6,742	1.2	-1	$909	$4,706	$910	$3,796	4.2	6,624
Variable Frequency Drive (VFD) Measures			**71,143**	**18.5**	**0**	**$9,739**	**$111,172**	**$9,000**	**$102,172**	**10.5**	**71,641**
ECM 6	Install VFDs on Constant Volume (CV) Fans	Yes	71,143	18.5	0	$9,739	$111,172	$9,000	$102,172	10.5	71,641
Electric Unitary HVAC Measures			**28,283**	**28.2**	**0**	**$3,872**	**$328,713**	**$27,080**	**$301,633**	**77.9**	**28,481**
ECM 7	Install High Efficiency Air Conditioning Units	No	28,283	28.2	0	$3,872	$328,713	$27,080	$301,633	77.9	28,481
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**621**	**$5,968**	**$147,608**	**$33,627**	**$113,981**	**19.1**	**72,764**
ECM 8	Install High Efficiency Hot Water Boilers	No	0	0.0	74	$715	$66,835	$10,427	$56,408	78.9	8,722
ECM 9	Install High Efficiency Furnaces	No	0	0.0	547	$5,253	$80,773	$23,200	$57,573	11.0	64,043
HVAC System Improvements			**220**	**0.0**	**5**	**$76**	**$2,719**	**$0**	**$2,719**	**35.9**	**778**
ECM 10	Implement Demand Control Ventilation (DCV)	No	220	0.0	5	$76	$2,719	$0	$2,719	35.9	778
Domestic Water Heating Upgrade			**0**	**0.0**	**22**	**$208**	**$330**	**$323**	**$6**	**0.0**	**2,536**
ECM 11	Install Low-Flow DHW Devices	Yes	0	0.0	22	$208	$330	$323	$6	0.0	2,536
Food Service & Refrigeration Measures			**8,625**	**1.0**	**0**	**$1,181**	**$6,754**	**$0**	**$6,754**	**5.7**	**8,685**
ECM 12	Replace Refrigeration Equipment	Yes	8,625	1.0	0	$1,181	$6,754	$0	$6,754	5.7	8,685
TOTALS (COST EFFECTIVE MEASURES)			**198,260**	**46.0**	**-2**	**$27,123**	**$163,865**	**$32,059**	**$131,806**	**4.9**	**199,428**
TOTALS (ALL MEASURES)			**226,763**	**74.2**	**624**	**$37,039**	**$642,905**	**$92,766**	**$550,139**	**14.9**	**301,451**

KNOLLWOOD ELEMENTARY SCHOOL

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			83,829	22.4	-18	$12,680	$37,090	$19,196	$17,894	1.4	82,362
ECM 1	Retrofit Fixtures with LED Lamps	Yes	83,829	22.4	-18	$12,680	$37,090	$19,196	$17,894	1.4	82,362
Lighting Control Measures			8,009	1.6	-2	$1,211	$6,705	$1,120	$5,585	4.6	7,869
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	8,009	1.6	-2	$1,211	$6,705	$1,120	$5,585	4.6	7,869
Variable Frequency Drive (VFD) Measures			40,938	9.3	0	$6,272	$105,899	$6,050	$99,849	15.9	41,225
ECM 3	Install VFDs on Constant Volume (CV) Fans	No	35,790	8.7	0	$5,483	$74,070	$5,250	$68,820	12.6	36,041
ECM 4	Install VFDs on Heating Water Pumps	No	5,148	0.6	0	$789	$31,829	$800	$31,029	39.3	5,184
Electric Unitary HVAC Measures			8,248	6.0	0	$1,264	$49,488	$3,680	$45,808	36.3	8,305
ECM 5	Install High Efficiency Air Conditioning Units	No	8,248	6.0	0	$1,264	$49,488	$3,680	$45,808	36.3	8,305
Gas Heating (HVAC/Process) Replacement			0	0.0	32	$295	$9,516	$2,400	$7,116	24.1	3,694
ECM 6	Install High Efficiency Furnaces	No	0	0.0	32	$295	$9,516	$2,400	$7,116	24.1	3,694
Domestic Water Heating Upgrade			0	0.0	20	$186	$244	$244	$0	0.0	2,333
ECM 7	Install Low-Flow DHW Devices	Yes	0	0.0	20	$186	$244	$244	$0	0.0	2,333
Food Service & Refrigeration Measures			3,659	0.4	0	$561	$3,034	$100	$2,934	5.2	3,685
ECM 8	Replace Refrigeration Equipment	Yes	2,048	0.2	0	$314	$2,804	$0	$2,804	8.9	2,062
ECM 9	Vending Machine Control	Yes	1,612	0.2	0	$247	$230	$100	$130	0.5	1,623
TOTALS (COST EFFECTIVE MEASURES)			95,497	24.5	1	$14,638	$47,073	$20,660	$26,413	1.8	96,250
TOTALS (ALL MEASURES)			144,683	39.8	32	$22,468	$211,977	$32,790	$179,187	8.0	149,474

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RANDOLPHVILLE ELEMENTARY SCHOOL

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			84,527	23.5	-18	$10,050	$36,960	$19,314	$17,646	1.8	83,048
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	327	0.3	0	$39	$481	$140	$341	8.8	321
ECM 2	Retrofit Fixtures with LED Lamps	Yes	84,200	23.2	-18	$10,011	$36,479	$19,174	$17,305	1.7	82,727
Lighting Control Measures			4,969	1.0	-1	$591	$3,780	$910	$2,870	4.9	4,882
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	4,969	1.0	-1	$591	$3,780	$910	$2,870	4.9	4,882
Motor Upgrades			460	0.1	0	$56	$1,409	$0	$1,409	25.3	463
ECM 4	Premium Efficiency Motors	No	460	0.1	0	$56	$1,409	$0	$1,409	25.3	463
Variable Frequency Drive (VFD) Measures			10,238	2.1	0	$1,238	$11,822	$2,600	$9,222	7.4	10,310
ECM 5	Install VFDs on Constant Volume (CV) Fans	Yes	5,787	1.5	0	$700	$4,197	$1,800	$2,397	3.4	5,827
ECM 6	Install VFDs on Heating Water Pumps	No	4,452	0.6	0	$538	$7,625	$800	$6,825	12.7	4,483
Electric Unitary HVAC Measures			5,011	6.4	0	$606	$50,426	$4,048	$46,378	76.5	5,046
ECM 7	Install High Efficiency Air Conditioning Units	No	5,011	6.4	0	$606	$50,426	$4,048	$46,378	76.5	5,046
Gas Heating (HVAC/Process) Replacement			0	0.0	60	$576	$9,516	$2,400	$7,116	12.4	6,984
ECM 8	Install High Efficiency Furnaces	Yes	0	0.0	60	$576	$9,516	$2,400	$7,116	12.4	6,984
HVAC System Improvements			0	0.0	1	$8	$17	$6	$11	1.4	100
ECM 9	Install Pipe Insulation	Yes	0	0.0	1	$8	$17	$6	$11	1.4	100
Domestic Water Heating Upgrade			0	0.0	23	$220	$258	$258	$0	0.0	2,667
ECM 10	Install Low-Flow DHW Devices	Yes	0	0.0	23	$220	$258	$258	$0	0.0	2,667
Food Service & Refrigeration Measures			6,673	0.8	0	$807	$7,070	$750	$6,320	7.8	6,719
ECM 11	Replace Refrigeration Equipment	Yes	6,673	0.8	0	$807	$7,070	$750	$6,320	7.8	6,719
TOTALS (COST EFFECTIVE MEASURES)			101,955	26.7	65	$12,951	$61,799	$25,438	$36,360	2.8	110,228
TOTALS (ALL MEASURES)			111,878	33.8	65	$14,151	$121,259	$30,286	$90,973	6.4	120,220

FELLOWSHIP FARMS SCHOOL

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			81,815	18.2	-17	$10,425	$21,792	$11,594	$10,198	1.0	80,384
ECM 1	Install LED Fixtures	Yes	267	0.1	0	$34	$497	$40	$457	13.4	262
ECM 2	Retrofit Fixtures with LED Lamps	Yes	81,548	18.2	-17	$10,391	$21,294	$11,554	$9,740	0.9	80,122
Lighting Control Measures			20,533	4.5	-4	$2,617	$14,730	$5,160	$9,570	3.7	20,174
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	18,660	4.1	-4	$2,378	$12,480	$3,010	$9,470	4.0	18,334
ECM 4	Install High/Low Lighting Controls	Yes	1,873	0.4	0	$239	$2,250	$2,150	$100	0.4	1,840
Motor Upgrades			264	0.1	0	$34	$711	$0	$711	20.8	266
ECM 5	Premium Efficiency Motors	No	264	0.1	0	$34	$711	$0	$711	20.8	266
Electric Unitary HVAC Measures			39,725	3.5	0	$5,146	$32,338	$2,530	$29,808	5.8	40,003
ECM 6	Install High Efficiency Air Conditioning Units	No	3,095	1.2	0	$401	$11,345	$920	$10,425	26.0	3,117
ECM 7	Install High Efficiency Heat Pumps	Yes	36,630	2.3	0	$4,745	$20,993	$1,610	$19,383	4.1	36,886
HVAC System Improvements			1,488	0.0	14	$334	$2,719	$0	$2,719	8.1	3,133
ECM 8	Implement Demand Control Ventilation (DCV)	Yes	1,488	0.0	14	$334	$2,719	$0	$2,719	8.1	3,133
Domestic Water Heating Upgrade			0	0.0	4	$44	$1,624	$112	$1,512	34.7	504
ECM 9	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	4	$44	$1,624	$112	$1,512	34.7	504
Food Service & Refrigeration Measures			1,954	0.2	0	$253	$460	$100	$360	1.4	1,968
ECM 10	Vending Machine Control	Yes	1,954	0.2	0	$253	$460	$100	$360	1.4	1,968
TOTALS (COST EFFECTIVE MEASURES)			142,420	25.2	-7	$18,374	$60,693	$18,464	$42,229	2.3	142,546
TOTALS (ALL MEASURES)			145,780	26.5	-3	$18,853	$74,373	$19,496	$54,877	2.9	146,433

ETHEL RD. COMPLEX

#	Energy Conservation Measure	Cost Effective?	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_2e Emissions Reduction (lbs)
Lighting Upgrades			36,566	11.6	-8	$4,959	$21,355	$8,282	$13,073	2.6	35,892
ECM 1	Install LED Fixtures	Yes	2,059	0.0	0	$284	$2,250	$1,800	$450	1.6	2,073
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	9,386	4.6	-2	$1,272	$10,554	$3,100	$7,454	5.9	9,199
ECM 3	Retrofit Fixtures with LED Lamps	Yes	25,121	7.0	-6	$3,404	$8,551	$3,382	$5,169	1.5	24,621
Lighting Control Measures			2,075	0.7	0	$281	$4,275	$995	$3,280	11.7	2,033
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	1,895	0.7	0	$257	$4,050	$770	$3,280	12.8	1,857
ECM 5	Install High/Low Lighting Controls	Yes	180	0.0	0	$24	$225	$225	$0	0.0	176
Electric Unitary HVAC Measures			907	0.6	0	$125	$5,781	$0	$5,781	46.3	914
ECM 6	Install High Efficiency Air Conditioning Units	No	907	0.6	0	$125	$5,781	$0	$5,781	46.3	914
Gas Heating (HVAC/Process) Replacement			0	0.0	142	$1,410	$13,156	$6,000	$7,156	5.1	16,574
ECM 7	Install High Efficiency Furnaces	Yes	0	0.0	118	$1,171	$10,332	$4,000	$6,332	5.4	13,764
ECM 8	Install Infrared Heaters	Yes	0	0.0	24	$239	$2,824	$2,000	$824	3.4	2,810
HVAC System Improvements			0	0.0	98	$979	$4,288	$0	$4,288	4.4	11,512
ECM 9	Install Programmable Thermostats	Yes	0	0.0	98	$979	$4,288	$0	$4,288	4.4	11,512
Food Service & Refrigeration Measures			1,612	0.2	0	$222	$230	$100	$130	0.6	1,623
ECM 10	Vending Machine Control	Yes	1,612	0.2	0	$222	$230	$100	$130	0.6	1,623
TOTALS (COST EFFECTIVE MEASURES)			40,252	12.5	231	$7,852	$43,304	$15,377	$27,927	3.6	67,635
TOTALS (ALL MEASURES)			41,160	13.1	231	$7,977	$49,086	$15,377	$33,709	4.2	68,549

BPU New Jersey's cleanenergy program™

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

Whole Buildings:

- **Pay for Performance**

Energy Generation:

- Combined Heat and Power – Fuel Cells

Other Programs

Renewable Energy Generation:

- **SREC Registration Program (SRP)**
- **Community Solar**

New Jersey's cleanenergy program™

Solar Energy Generation Potential

	Piscatway HS	Conackamack MS	Quibbletown MS	T. Schor	Arbor IS
Potential:	**HIGH**	**HIGH**	**HIGH**	**Medium**	**Medium**
System Potential: (kW)	1,450	140	161	278	190
Electric Generation: (kWh per year)	1,727,487	166,792	191,811	209,180	142,964
Displaced Cost: (per year)	$186,390	$21,700	$20,260	$27,950	$14,770

SREC Registration Program (SRP):

http://www.NJCleanEnergy.com/SREC

Community Solar Energy Pilot Program:

http://www.NJCleanEnergy.com/CommunitySolar

New Jersey's cleanenergy program™

Solar Energy Generation Potential

	MLK ES	Eisenhower ES	Grandview ES	Fellowship Farms
Potential:	**Medium**	**HIGH**	**HIGH**	**HIGH**
System Potential: (kW)	250	270	250	274
Electric Generation: (kWh per year)	188,111	321,670	29,843	326,435
Displaced Cost: (per year)	$25,220	$42,000	$40,770	$42,290

SREC Registration Program (SRP):

http://www.NJCleanEnergy.com/SREC

Community Solar Energy Pilot Program:

http://www.NJCleanEnergy.com/CommunitySolar

New Jersey's cleanenergy program™

Recommended NJCEP Incentives per Building

Piscataway BOE	Pay For Performance	Direct Install	SmartStart	CTEEP
Piscataway HS	X		**X**	**X**
Conackamack MS	**X**		**X**	**X**
Quibbletown MS	X		**X**	**X**
T. Schor MS	X		**X**	**X**
Arbor Intermediate School	**X**		**X**	**X**
MLK Intermediate School	**X**		**X**	**X**
Eisenhower ES	**X**		**X**	**X**
Grandview ES	**X**		**X**	**X**
Knollwood ES		**X**	**X**	**X**
Randolphville ES		**X**	**X**	**X**
Fellowship Farms	X		**X**	**X**
Ethel Rd. Complex		**X**	**X**	**X**

Buildings marked with a lighter X do not quite meet the requirements of the current P4P program.

P4P should be evaluated again once project planning is underway.

Pay for Performance

NJCleanEnergy.com/P4P

NEW JERSEY'S CLEAN ENERGY PROGRAM
P4P
PAY FOR PERFORMANCE

What is P4P: Comprehensive, whole-building approach to saving energy in existing or new facilities.

Qualifications: Annual peak demand 200 kW+ in the previous year for existing buildings

About: Customer choose from a network of pre-approved ***Participating Partners***

Incentives:

- Incentives paid in *three* installments
  - Up to $2MM per project ($4MM entity cap/year)
    - $1 million for electric measures
    - $1 million for gas measures
  - Up to 50% of project cost (**80%** for UEZ/OZ/Local Govt./ **K-12 Public Schools**) up to $2MM per project / $4MM per entity annually

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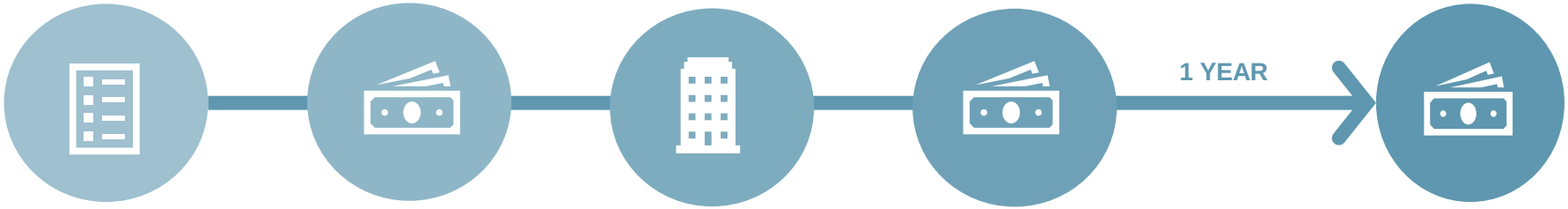
Pay for Performance

NJCleanEnergy.com/P4P



Program Enrollment

Submission and Approval of Application

Energy Reduction Plan (ERP)

Development and Approval

Incentive #1
fixed

Installation of Measures

Installation Report

Incentive #2
up to 25% project cost

FY20: Up to 40% for K-12 Public Schools

Verification of Savings

Comparison of Performance vs ERP

Incentive #3
up to 25% project cost

FY20: Up to 40% for K-12 Public Schools

New Jersey's cleanenergy program™

DIRECT INSTALL

NJCleanEnergy.com/DI

What is DI: Turn-key retrofit program to replace outdated and inefficient equipment, including lighting, HVAC, refrigeration, etc.

Qualifications: Average electric peak demand <200 kW in the previous 12 months

About:

- Pre-approved participating contractors provide support and process paperwork
- Incentives paid directly to the contractor
- Fast project turnaround time (4-6 months)

Incentives:

- $125,000 incentive funding per project/building (**$250K** UEZ/OZ/ Local Govt./**K-12 Public Schools**), or
- $250,000 entity cap (**$4MM** UEZ/OZ/Local Govt./**K-12 Public Schools**)

DIRECT INSTALL

NJCleanEnergy.com/DI

Facilities in Urban Enterprise Zones (UEZ), Opportunity Zones (OZ), Local Governments, and K-12 public schools:

INCENTIVE FUNDING	CUSTOMER
Up to **80%** of installed cost is paid directly to the contractor	20% of installed cost

All other eligible facilities:

INCENTIVE FUNDING	CUSTOMER
Up to **70%** of installed cost is paid directly to the contractor	30% of installed cost

DIRECT INSTALL

NJCleanEnergy.com/DI

Participating Contractor

Tri-State Light & Energy, Inc.
Alan Rhode
610-789-1900 x226
asr@tsle.com

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SMARTSTART

NJCleanEnergy.com/SSB

What is SSB: Individual high efficiency equipment rebates for new construction, renovation, remodeling, equipment replacement

Qualifications:

- All C&I customer types contributing into the Societal Benefits Charge (SBC)

About:

- Prescriptive and custom designed measures
- Pre-approval required only for lighting projects with incentives >$100,000 and *all* custom projects
- For measures not requiring pre-approval, applications must be submitted to the program within one year of purchase.

Incentives:

- Prescriptive: $500,000 cap for each electric or gas account
- Custom, lesser of the following:
  - $0.16/kWh and/or $1.60/Therm saved annually
  - 50% of incremental installed cost
  - Buy-down to 1 year payback based on incremental cost and savings

SMARTSTART

NJCleanEnergy.com/SSB

Prescriptive Incentives

- Lighting & Lighting Controls
- Packaged HVAC
- Boilers & Water Heaters
- Chillers
- VFD's
- Food Service
- Refrigeration

Prescriptive Only:

DOUBLE INCENTIVES FOR OZ/UEZ/ LOCAL GOVT./K-12 PUBLIC SCHOOLS

Custom Incentives

- New or innovative technologies proven to be cost-effective and not listed as prescriptive
- Projects must have a minimum first year energy savings of 75,000 kWh or 1,500 therms
- Project pre and post inspection required

New Jersey's cleanenergy program™

Customer Tailored Energy Efficiency Pilot

NJCleanEnergy.com/CTEEP

What is CTEEP: A streamlined/single application process for participants submitting multiple different technology types.

Qualifications:

- All C&I customer types contributing into the Societal Benefits Charge (SBC)

About:

- On site assistance available
- Additional technical incentive available to offset soft costs associated with developing and planning custom projects

Incentives:

- $250,000 fiscal year entity cap
- Technical assistance incentives for custom project evaluation (up to $10K)

SAME INCENTIVE VALUES AS SMARTSTART

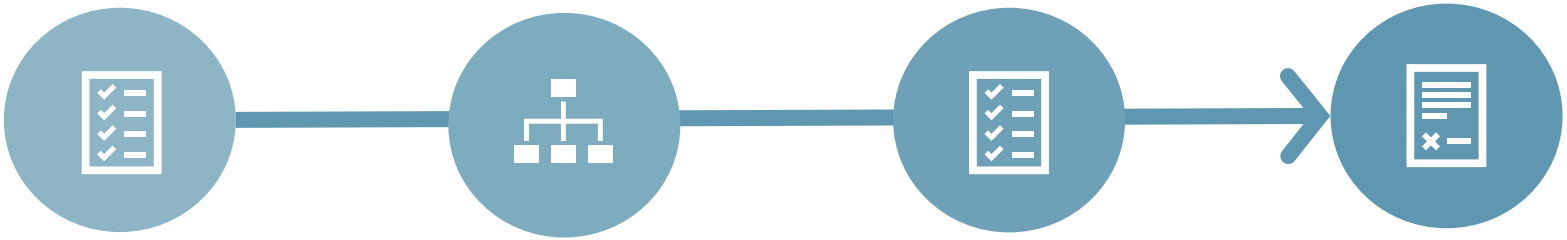
New Jersey's cleanenergy program™

FINANCING MECHANISM: ESIP

ENERGY SAVINGS IMPROVEMENT PROGRAM (ESIP)

- Provides alternative financing for energy savings projects at public institutions
- Administered directly by the BPU
- Value of energy savings leveraged to pay for cost of EE projects over a 15 year contract
- Requires NO new bonding and is outside of capital budget
- Does not count as debt or require voter approval

Financing Mechanism: ESIP



Initial Energy Audit

Includes LGEA

Select Path

ESCO (requires RFP)
Hybrid
DIY

Investment Grade Energy Audit

Energy Savings Plan Developed & Approved

Plan includes use of incentives through New Jersey's Clean Energy Program

Energy Savings Improvement Program (ESIP)

FOR MORE INFORMATION

Michelle Rossi

ESIP Coordinator

Office: 609-633-9641

ESIP@bpu.nj.gov

BPU New Jersey's cleanenergy program™

For More Information

Visit NJCleanEnergy.com

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QUESTIONS

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