

New Jersey's Clean Energy Program

LGEA Exit Meeting for:
Jackson Township Board of Education

Smruti Srinivasan, TRC

June 11, 2018

Introductions



- *Jackson Township BOE*
 - Michelle Richardson – Business Administrator
 - John Blair – Energy Education Specialist
 - Edward Ostroff – Facilities Manager
- *NJ Clean Energy Program – TRC & BPU*
 - Smruti Srinivasan – Auditor
 - Brian DeLuca – Program Manager
 - Upendra Chivukula – BPU Commissioner

Agenda



- 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 Jackson Township Board of Education

Process to Draft Report



- Application submitted to NJCEP
- Site Visit Performed
- Utility Analysis
- Baseline Condition
- Analysis
- Recommendations
- Report

Site Visit and Utility Analysis



Overview of Systems, Baseline & Existing Conditions:

- Building Envelope
- Lighting System
- HVAC and Mechanical Systems

Utility Consumption:

- Electric Consumption and Costs
- Natural Gas Consumption and Costs
- Solar PV

Entities Visited/Analyzed

- Jackson Liberty High School
- Jackson Memorial High School
- Carl W. Goetz Middle School
- Christa McCauliffe Middle School
- Howard C. Johnson Elementary School
- Elms Elementary School
- Crawford Rodriguez Elementary School
- Lucy N. Holman Elementary School
- Sylvia Rosenauer Elementary School
- Switlik Elementary School
- Jackson Township BOE Administration Office
- Jackson Township BOE Transportation Facility
- Jackson BOE Maintenance Building

All Evaluated ECMS

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	2,947,295	542.0	0.0	\$358,323.18	\$2,886,606.97	\$286,245.00	\$2,600,361.97	7.3	2,967,903
Install LED Fixtures	926,779	132.0	0.0	\$111,556.44	\$1,687,904.50	\$94,965.00	\$1,592,939.50	14.3	933,260
Retrofit Fixtures with LED Lamps	2,020,516	410.0	0.0	\$246,766.74	\$1,198,702.47	\$191,280.00	\$1,007,422.47	4.1	2,034,643
Lighting Control Measures	476,002	94.7	0.0	\$58,680.14	\$631,722.00	\$45,265.00	\$586,457.00	10.0	479,330
Install Occupancy Sensor Lighting Controls	411,125	82.0	0.0	\$50,773.49	\$348,806.00	\$42,065.00	\$306,741.00	6.0	414,000
Install High/Low Lighting Controls	64,877	12.7	0.0	\$7,906.65	\$282,916.00	\$3,200.00	\$279,716.00	35.4	65,331
Motor Upgrades	6,746	1.6	0.0	\$796.98	\$21,156.05	\$0.00	\$21,156.05	26.5	6,793
Premium Efficiency Motors	6,746	1.6	0.0	\$796.98	\$21,156.05	\$0.00	\$21,156.05	26.5	6,793
Variable Frequency Drive (VFD) Measures	335,842	57.3	0.0	\$40,064.03	\$256,522.63	\$22,360.00	\$234,162.63	5.8	338,190
Install VFDs on Constant Volume (CV) HVAC	143,635	39.5	0.0	\$17,254.03	\$181,153.98	\$21,160.00	\$159,993.98	9.3	144,639
Install VFDs on Chilled Water Pumps	71,340	7.3	0.0	\$8,158.22	\$20,777.80	\$0.00	\$20,777.80	2.5	71,839
Install VFDs on Hot Water Pumps	97,202	10.5	0.0	\$11,945.55	\$48,256.55	\$0.00	\$48,256.55	4.0	97,881
Install VFDs on Cooling Tower Fans	23,665	0.0	0.0	\$2,706.23	\$6,334.30	\$1,200.00	\$5,134.30	1.9	23,830
Electric Unitary HVAC Measures	457,484	258.5	0.0	\$57,590.07	\$4,797,046.48	\$322,981.99	\$4,474,064.49	77.7	460,683
Install High Efficiency Electric AC	368,037	204.9	0.0	\$45,502.56	\$2,266,182.33	\$85,473.99	\$2,180,708.34	47.9	370,611
Install High Efficiency Heat Pumps	88,693	53.1	0.0	\$11,997.19	\$2,527,034.53	\$237,378.00	\$2,289,656.53	190.8	89,313
Install High Efficiency Packaged Terminal AC/HP	754	0.4	0.0	\$90.32	\$3,829.62	\$130.00	\$3,699.62	41.0	759
Electric Chiller Replacement	251,104	71.6	0.0	\$28,715.45	\$362,990.00	\$21,500.00	\$341,490.00	11.9	252,860
Install High Efficiency Chillers	251,104	71.6	0.0	\$28,715.45	\$362,990.00	\$21,500.00	\$341,490.00	11.9	252,860
Gas Heating (HVAC/Process) Replacement	0	0.0	1,596.3	\$18,493.25	\$295,619.11	\$25,898.36	\$269,720.75	14.6	214,287
Install High Efficiency Hot Water Boilers	0	0.0	1,584.6	\$18,335.09	\$293,829.32	\$25,898.36	\$267,930.96	14.6	212,917
Install High Efficiency Unit Heaters	0	0.0	11.7	\$158.16	\$1,789.79	\$0.00	\$1,789.79	11.3	1,370
HVAC System Improvements	3,144	0.7	0.0	\$382.34	\$1,250.00	\$500.00	\$750.00	2.0	3,166
Install Dual Enthalpy Outside Economizer Control	3,144	0.7	0.0	\$382.34	\$1,250.00	\$500.00	\$750.00	2.0	3,166
Domestic Water Heating Upgrade	22,721	0.0	191.4	\$5,589.35	\$20,429.77	\$558.00	\$19,871.77	3.6	45,405
Install High Efficiency Gas Water Heater	0	0.0	18.6	\$256.17	\$18,974.26	\$558.00	\$18,416.26	71.9	2,184
Install Low-Flow Domestic Hot Water Devices	22,721	0.0	172.8	\$5,333.18	\$1,455.51	\$0.00	\$1,455.51	0.3	43,221
Plug Load Equipment Control - Vending Machine	53,191	0.0	0.0	\$6,314.26	\$7,590.00	\$0.00	\$7,590.00	1.2	53,563
Vending Machine Control	53,191	0.0	0.0	\$6,314.26	\$7,590.00	\$0.00	\$7,590.00	1.2	53,563
TOTALS	4,553,530	1,026.3	1,787.7	\$574,949.05	\$9,280,933.01	\$725,308.35	\$8,555,624.66	14.9	4,822,180

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

All Recommended ECMS

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		2,947,295	542.0	0.0	\$358,323.18	\$2,886,606.97	\$286,245.00	\$2,600,361.97	7.3	2,967,903
ECM 1	Install LED Fixtures	926,779	132.0	0.0	\$111,556.44	\$1,687,904.50	\$94,965.00	\$1,592,939.50	14.3	933,260
ECM 2	Retrofit Fixtures with LED Lamps	2,020,516	410.0	0.0	\$246,766.74	\$1,198,702.47	\$191,280.00	\$1,007,422.47	4.1	2,034,643
Lighting Control Measures		440,602	87.5	0.0	\$54,524.66	\$414,922.00	\$42,865.00	\$372,057.00	6.8	443,682
ECM 3	Install Occupancy Sensor Lighting Controls	411,125	82.0	0.0	\$50,773.49	\$348,806.00	\$42,065.00	\$306,741.00	6.0	414,000
ECM 4	Install High/Low Lighting Controls	29,477	5.6	0.0	\$3,751.17	\$66,116.00	\$800.00	\$65,316.00	17.4	29,683
Motor Upgrades		3,864	0.9	0.0	\$462.47	\$8,596.07	\$0.00	\$8,596.07	18.6	3,891
ECM 5	Premium Efficiency Motors	3,864	0.9	0.0	\$462.47	\$8,596.07	\$0.00	\$8,596.07	18.6	3,891
Variable Frequency Drive (VFD) Measures		328,361	55.3	0.0	\$39,151.92	\$239,633.88	\$21,320.00	\$218,313.88	5.6	330,657
ECM 6	Install VFDs on Constant Volume (CV) HVAC	138,238	37.7	0.0	\$16,595.99	\$169,337.36	\$20,120.00	\$149,217.36	9.0	139,205
ECM 7	Install VFDs on Chilled Water Pumps	71,340	7.3	0.0	\$8,158.22	\$20,777.80	\$0.00	\$20,777.80	2.5	71,839
ECM 8	Install VFDs on Hot Water Pumps	95,118	10.3	0.0	\$11,691.48	\$43,184.42	\$0.00	\$43,184.42	3.7	95,783
ECM 9	Install VFDs on Cooling Tower Fans	23,665	0.0	0.0	\$2,706.23	\$6,334.30	\$1,200.00	\$5,134.30	1.9	23,830
Electric Unitary HVAC Measures		6,546	2.3	0.0	\$771.17	\$12,717.87	\$782.00	\$11,935.87	15.5	6,591
ECM 10	Install High Efficiency Electric AC	6,546	2.3	0.0	\$771.17	\$12,717.87	\$782.00	\$11,935.87	15.5	6,591
Electric Chiller Replacement		251,104	71.6	0.0	\$28,715.45	\$362,990.00	\$21,500.00	\$341,490.00	11.9	252,860
ECM 11	Install High Efficiency Chillers	251,104	71.6	0.0	\$28,715.45	\$362,990.00	\$21,500.00	\$341,490.00	11.9	252,860
Gas Heating (HVAC/Process) Replacement		0	0.0	1,398.0	\$15,858.15	\$191,912.60	\$17,341.86	\$174,570.74	11.0	191,063
ECM 12	Install High Efficiency Hot Water Boilers	0	0.0	1,386.3	\$15,699.99	\$190,122.81	\$17,341.86	\$172,780.95	11.0	189,693
ECM 13	Install High Efficiency Unit Heaters	0	0.0	11.7	\$158.16	\$1,789.79	\$0.00	\$1,789.79	11.3	1,370
HVAC System Improvements		3,144	0.7	0.0	\$382.34	\$1,250.00	\$500.00	\$750.00	2.0	3,166
ECM 14	Install Dual Enthalpy Outside Economizer Control	3,144	0.7	0.0	\$382.34	\$1,250.00	\$500.00	\$750.00	2.0	3,166
Domestic Water Heating Upgrade		22,721	0.0	172.8	\$5,333.18	\$1,455.51	\$0.00	\$1,455.51	0.3	43,221
ECM 15	Install Low-Flow Domestic Hot Water Devices	22,721	0.0	172.8	\$5,333.18	\$1,455.51	\$0.00	\$1,455.51	0.3	43,221
Plug Load Equipment Control - Vending Machine		53,191	0.0	0.0	\$6,314.26	\$7,590.00	\$0.00	\$7,590.00	1.2	53,563
ECM 16	Vending Machine Control	53,191	0.0	0.0	\$6,314.26	\$7,590.00	\$0.00	\$7,590.00	1.2	53,563
TOTALS		4,056,828	760.3	1,570.7	\$509,836.78	\$4,127,674.90	\$390,553.86	\$3,737,121.04	7.3	4,296,598

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

All Non-Recommended ECMS

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 Control Measures	35,400	7.2	0.0	\$4,155.48	\$216,800.00	\$2,400.00	\$214,400.00	51.6	35,648
Install High/Low Lighting Controls	35,400	7.2	0.0	\$4,155.48	\$216,800.00	\$2,400.00	\$214,400.00	51.6	35,648
Motor Upgrades	2,883	0.7	0.0	\$334.51	\$12,559.98	\$0.00	\$12,559.98	37.5	2,903
Premium Efficiency Motors	2,883	0.7	0.0	\$334.51	\$12,559.98	\$0.00	\$12,559.98	37.5	2,903
Variable Frequency Drive (VFD) Measures	7,480	2.0	0.0	\$912.11	\$16,888.75	\$1,040.00	\$15,848.75	17.4	7,533
Install VFDs on Constant Volume (CV) HVAC	5,397	1.8	0.0	\$658.04	\$11,816.62	\$1,040.00	\$10,776.62	16.4	5,435
Install VFDs on Hot Water Pumps	2,084	0.3	0.0	\$254.07	\$5,072.13	\$0.00	\$5,072.13	20.0	2,098
Electric Unitary HVAC Measures	450,939	256.2	0.0	\$56,818.90	\$4,784,328.61	\$322,199.99	\$4,462,128.62	78.5	454,092
Install High Efficiency Electric AC	361,492	202.6	0.0	\$44,731.39	\$2,253,464.46	\$84,691.99	\$2,168,772.47	48.5	364,019
Install High Efficiency Heat Pumps	88,693	53.1	0.0	\$11,997.19	\$2,527,034.53	\$237,378.00	\$2,289,656.53	190.8	89,313
Install High Efficiency Packaged Terminal AC/HP	754	0.4	0.0	\$90.32	\$3,829.62	\$130.00	\$3,699.62	41.0	759
Gas Heating (HVAC/Process) Replacement	0	0.0	198.3	\$2,635.10	\$103,706.51	\$8,556.50	\$95,150.01	36.1	23,224
Install High Efficiency Hot Water Boilers	0	0.0	198.3	\$2,635.10	\$103,706.51	\$8,556.50	\$95,150.01	36.1	23,224
Domestic Water Heating Upgrade	0	0.0	18.6	\$256.17	\$18,974.26	\$558.00	\$18,416.26	71.9	2,184
Install High Efficiency Gas Water Heater	0	0.0	18.6	\$256.17	\$18,974.26	\$558.00	\$18,416.26	71.9	2,184
TOTALS	496,702	266.1	217.0	\$65,112.27	\$5,153,258.11	\$334,754.49	\$4,818,503.62	74.0	525,582

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

Jackson Liberty High School



Energy Conservation Measure		Recommend?	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			628,342	117.6	0.0	\$67,623.32	\$773,092.29	\$51,600.00	\$721,492.29	10.7	632,735
ECM 1	Install LED Fixtures	Yes	198,104	27.3	0.0	\$21,320.29	\$488,612.32	\$12,240.00	\$476,372.32	22.3	199,489
ECM 2	Retrofit Fixtures with LED Lamps	Yes	430,238	90.3	0.0	\$46,303.03	\$284,479.97	\$39,360.00	\$245,119.97	5.3	433,247
Lighting Control Measures			81,529	15.4	0.0	\$8,774.25	\$134,442.00	\$7,765.00	\$126,677.00	14.4	82,099
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	63,056	11.9	0.0	\$6,786.25	\$61,042.00	\$7,765.00	\$53,277.00	7.9	63,497
	Install High/Low Lighting Controls	No	18,472	3.5	0.0	\$1,988.00	\$73,400.00	\$0.00	\$73,400.00	36.9	18,601
Variable Frequency Drive (VFD) Measures			46,501	12.9	0.0	\$5,004.47	\$83,784.88	\$7,760.00	\$76,024.88	15.2	46,826
ECM 4	Install VFDs on Constant Volume (CV) HVAC	Yes	46,501	12.9	0.0	\$5,004.47	\$83,784.88	\$7,760.00	\$76,024.88	15.2	46,826
Electric Unitary HVAC Measures			38,473	21.7	0.0	\$4,140.53	\$594,871.80	\$1,782.00	\$593,089.80	143.2	38,742
	Install High Efficiency Electric AC	No	38,473	21.7	0.0	\$4,140.53	\$594,871.80	\$1,782.00	\$593,089.80	143.2	38,742
Domestic Water Heating Upgrade			0	0.0	6.6	\$82.23	\$100.38	\$0.00	\$100.38	1.2	774
ECM 5	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	6.6	\$82.23	\$100.38	\$0.00	\$100.38	1.2	774
Plug Load Equipment Control - Vending Machine			12,895	0.0	0.0	\$1,387.75	\$1,840.00	\$0.00	\$1,840.00	1.3	12,985
ECM 6	Vending Machine Control	Yes	12,895	0.0	0.0	\$1,387.75	\$1,840.00	\$0.00	\$1,840.00	1.3	12,985
TOTALS			807,739	167.6	6.6	\$87,012.56	\$1,588,131.35	\$68,907.00	\$1,519,224.35	17.5	814,161
TOTAL OF RECOMMENDED MEASURES			750,794	142	7	\$ 80,884.03	\$ 919,859.55	\$ 67,125.00	\$ 852,734.55	10.5	756,818

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

Jackson Memorial High School



Energy Conservation Measure		Recommend?	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			774,949	114.5	0.0	\$92,502.58	\$661,997.20	\$70,310.00	\$591,687.20	6.4	780,367
ECM 1	Install LED Fixtures	Yes	234,863	32.9	0.0	\$28,034.69	\$437,485.48	\$31,405.00	\$406,080.48	14.5	236,505
ECM 2	Retrofit Fixtures with LED Lamps	Yes	540,085	81.7	0.0	\$64,467.89	\$224,511.72	\$38,905.00	\$185,606.72	2.9	543,862
Lighting Control Measures			118,755	18.0	0.0	\$14,175.37	\$89,550.00	\$7,155.00	\$82,395.00	5.8	119,586
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	106,129	16.1	0.0	\$12,668.22	\$53,750.00	\$7,155.00	\$46,595.00	3.7	106,871
ECM 4	Install High/Low Lighting Controls	Yes	12,626	1.9	0.0	\$1,507.14	\$35,800.00	\$0.00	\$35,800.00	23.8	12,715
Domestic Water Heating Upgrade			13,232	0.0	45.0	\$2,330.01	\$9,415.90	\$308.00	\$9,107.90	3.9	18,596
	Install High Efficiency Gas Water Heater	No	0	0.0	4.2	\$69.90	\$8,899.66	\$308.00	\$8,591.66	122.9	491
ECM 5	Install Low-Flow Domestic Hot Water Devices	Yes	13,232	0.0	40.8	\$2,260.10	\$516.24	\$0.00	\$516.24	0.2	18,105
Plug Load Equipment Control - Vending Machine			11,283	0.0	0.0	\$1,346.79	\$1,610.00	\$0.00	\$1,610.00	1.2	11,362
ECM 6	Vending Machine Control	Yes	11,283	0.0	0.0	\$1,346.79	\$1,610.00	\$0.00	\$1,610.00	1.2	11,362
TOTAL OF ALL EVALUATED ECMS			918,219	132.5	45.0	\$110,354.75	\$762,573.10	\$77,773.00	\$684,800.10	6.2	929,911
TOTAL OF ALL RECOMMENDED ECMS			918,219	133	41	110,285	753,673	77,465	676,208	6.1	929,420
TOTAL OF ALL NON-RECOMMENDED ECMS			0	0	4	70	8,900	308	8,592	122.9	491

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

Carl W. Goetz Middle School



Energy Conservation Measure		Recommend?	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			251,346	49.7	0.0	\$32,865.45	\$234,911.32	\$30,915.00	\$203,996.32	6.2	253,104
ECM 1	Install LED Fixtures	Yes	47,924	6.6	0.0	\$6,266.40	\$94,522.23	\$6,500.00	\$88,022.23	14.0	48,259
ECM 2	Retrofit Fixtures with LED Lamps	Yes	203,422	43.1	0.0	\$26,599.05	\$140,389.10	\$24,415.00	\$115,974.10	4.4	204,845
Lighting Control Measures			58,076	12.3	0.0	\$7,593.86	\$152,131.56	\$6,771.67	\$145,359.89	19.1	58,482
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	44,091	9.3	0.0	\$5,765.27	\$33,026.00	\$4,305.00	\$28,721.00	5.0	44,399
	Install High/Low Lighting Controls	No	13,985	3.0	0.0	\$1,828.59	\$119,105.56	\$2,466.67	\$116,638.89	63.8	14,082
Variable Frequency Drive (VFD) Measures			39,713	6.8	0.0	\$5,192.77	\$26,168.41	\$2,160.00	\$24,008.41	4.6	39,991
ECM 4	Install VFDs on Constant Volume (CV) HVAC	Yes	21,318	4.9	0.0	\$2,787.50	\$18,954.81	\$2,160.00	\$16,794.81	6.0	21,467
ECM 5	Install VFDs on Hot Water Pumps	Yes	18,395	1.9	0.0	\$2,405.27	\$7,213.60	\$0.00	\$7,213.60	3.0	18,523
Electric Unitary HVAC Measures			124,302	63.9	0.0	\$16,253.43	\$404,403.27	\$17,057.40	\$387,345.87	23.8	125,171
	Install High Efficiency Electric AC	No	124,302	63.9	0.0	\$16,253.43	\$404,403.27	\$17,057.40	\$387,345.87	23.8	125,171
Gas Heating (HVAC/Process) Replacement			0	0.0	588.6	\$6,226.01	\$105,266.85	\$7,867.86	\$97,398.99	15.6	96,294
ECM 6	Install High Efficiency Hot Water Boilers	Yes	0	0.0	588.6	\$6,226.01	\$105,266.85	\$7,867.86	\$97,398.99	15.6	96,294
Domestic Water Heating Upgrade			0	0.0	2.4	\$25.69	\$14.34	\$0.00	\$14.34	0.6	397
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	2.4	\$25.69	\$14.34	\$0.00	\$14.34	0.6	397
Plug Load Equipment Control - Vending Machine			6,447	0.0	0.0	\$843.04	\$920.00	\$0.00	\$920.00	1.1	6,492
ECM 8	Vending Machine Control	Yes	6,447	0.0	0.0	\$843.04	\$920.00	\$0.00	\$920.00	1.1	6,492
TOTALS			479,884	132.7	591.0	\$69,000.26	\$923,815.75	\$64,771.93	\$859,043.82	12.4	579,930

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

Christa McCauliffe Middle School



Energy Conservation Measure		Recommend?	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			262,579	52.4	0.0	\$31,454.89	\$161,087.62	\$25,860.00	\$135,227.62	4.3	264,415
ECM 1	Install LED Fixtures	Yes	91,996	12.6	0.0	\$11,020.41	\$52,088.18	\$3,970.00	\$48,118.18	4.4	92,639
ECM 2	Retrofit Fixtures with LED Lamps	Yes	170,583	39.8	0.0	\$20,434.48	\$108,999.45	\$21,890.00	\$87,109.45	4.3	171,775
Lighting Control Measures			48,063	10.9	0.0	\$5,757.58	\$34,928.67	\$4,565.00	\$30,363.67	5.3	48,399
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	45,083	10.3	0.0	\$5,400.63	\$31,146.00	\$3,765.00	\$27,381.00	5.1	45,399
ECM 4	Install High/Low Lighting Controls	Yes	2,980	0.7	0.0	\$356.95	\$3,782.67	\$800.00	\$2,982.67	8.4	3,001
Motor Upgrades			3,011	0.7	0.0	\$360.66	\$4,813.23	\$0.00	\$4,813.23	13.3	3,032
ECM 5	Premium Efficiency Motors	Yes	3,011	0.7	0.0	\$360.66	\$4,813.23	\$0.00	\$4,813.23	13.3	3,032
Variable Frequency Drive (VFD) Measures			34,361	6.1	0.0	\$4,116.17	\$26,507.72	\$2,320.00	\$24,187.72	5.9	34,601
ECM 6	Install VFDs on Constant Volume (CV) HVAC	Yes	13,271	3.9	0.0	\$1,589.80	\$14,029.20	\$2,320.00	\$11,709.20	7.4	13,364
ECM 7	Install VFDs on Hot Water Pumps	Yes	21,090	2.2	0.0	\$2,526.37	\$12,478.52	\$0.00	\$12,478.52	4.9	21,237
Electric Unitary HVAC Measures			82,772	47.0	0.0	\$9,915.48	\$590,109.18	\$32,176.50	\$557,932.68	56.3	83,351
	Install High Efficiency Electric AC	No	82,018	46.6	0.0	\$9,825.16	\$586,279.56	\$32,046.50	\$554,233.06	56.4	82,592
	Install High Efficiency Packaged Terminal AC/HP	No	754	0.4	0.0	\$90.32	\$3,829.62	\$130.00	\$3,699.62	41.0	759
Gas Heating (HVAC/Process) Replacement			0	0.0	141.1	\$1,920.32	\$77,547.03	\$6,516.00	\$71,031.03	37.0	16,522
	Install High Efficiency Hot Water Boilers	No	0	0.0	141.1	\$1,920.32	\$77,547.03	\$6,516.00	\$71,031.03	37.0	16,522
Domestic Water Heating Upgrade			0	0.0	77.9	\$1,060.53	\$236.61	\$0.00	\$236.61	0.2	9,125
ECM 8	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	77.9	\$1,060.53	\$236.61	\$0.00	\$236.61	0.2	9,125
Plug Load Equipment Control - Vending Machine			9,671	0.0	0.0	\$1,158.51	\$1,380.00	\$0.00	\$1,380.00	1.2	9,739
ECM 9	Vending Machine Control	Yes	9,671	0.0	0.0	\$1,158.51	\$1,380.00	\$0.00	\$1,380.00	1.2	9,739
TOTAL OF EVALUATED MEASURES			440,457	117.1	219.0	\$55,744.14	\$896,610.06	\$71,437.50	\$825,172.56	14.8	469,184
TOTAL OF ALL RECOMMENDED MEASURES			357,685	70	78	\$ 43,908.34	\$ 228,953.84	\$ 32,745.00	\$ 196,208.84	4.5	369,310
TOTAL OF ALL NON_RECOMMENDED MEASURES			82,772	47	141	11,836	667,656	38,693	628,964	53.1	99,873

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

Howard C. Johnson Elementary School



Energy Conservation Measure		Recommend?	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			111,081	24.6	0.0	\$13,259.60	\$119,694.18	\$12,200.00	\$107,494.18	8.1	111,858
ECM 1	Install LED Fixtures	Yes	51,478	6.7	0.0	\$6,144.89	\$64,839.84	\$3,800.00	\$61,039.84	9.9	51,838
ECM 2	Retrofit Fixtures with LED Lamps	Yes	59,603	17.9	0.0	\$7,114.72	\$54,854.34	\$8,400.00	\$46,454.34	6.5	60,020
Lighting Control Measures			8,006	2.1	0.0	\$955.70	\$12,432.00	\$880.00	\$11,552.00	12.1	8,062
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	6,003	1.6	0.0	\$716.57	\$9,032.00	\$880.00	\$8,152.00	11.4	6,045
ECM 4	Install High/Low Lighting Controls	Yes	2,003	0.5	0.0	\$239.12	\$3,400.00	\$0.00	\$3,400.00	14.2	2,017
Motor Upgrades			853	0.2	0.0	\$101.81	\$3,782.84	\$0.00	\$3,782.84	37.2	859
ECM 5	Premium Efficiency Motors	Yes	853	0.2	0.0	\$101.81	\$3,782.84	\$0.00	\$3,782.84	37.2	859
Variable Frequency Drive (VFD) Measures			35,728	3.7	0.0	\$4,264.78	\$10,388.90	\$0.00	\$10,388.90	2.4	35,978
ECM 6	Install VFDs on Hot Water Pumps	Yes	35,728	3.7	0.0	\$4,264.78	\$10,388.90	\$0.00	\$10,388.90	2.4	35,978
Electric Unitary HVAC Measures			18,892	12.6	0.0	\$2,255.12	\$589,727.52	\$57,354.00	\$532,373.52	236.1	19,024
	Install High Efficiency Electric AC	No	4,354	2.8	0.0	\$519.75	\$27,227.52	\$1,104.00	\$26,123.52	50.3	4,385
	Install High Efficiency Heat Pumps	No	14,538	9.8	0.0	\$1,735.37	\$562,500.00	\$56,250.00	\$506,250.00	291.7	14,640
Plug Load Equipment Control - Vending Machine			1,612	0.0	0.0	\$192.40	\$230.00	\$0.00	\$230.00	1.2	1,623
ECM 7	Vending Machine Control	Yes	1,612	0.0	0.0	\$192.40	\$230.00	\$0.00	\$230.00	1.2	1,623
TOTALS			176,172	43.2	0.0	\$21,029.41	\$736,255.44	\$70,434.00	\$665,821.44	31.7	177,403
TOTAL OF ALL RECOMMENDED ECMS			157,280	31	0	\$ 18,774.29	\$ 146,527.92	\$ 13,080.00	\$ 133,447.92	7.1	158,379

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

Elms Elementary School



Energy Conservation Measure		Recommend?	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			111,081	24.6	0.0	\$13,259.60	\$119,694.18	\$12,200.00	\$107,494.18	8.1	111,858
ECM 1	Install LED Fixtures	Yes	51,478	6.7	0.0	\$6,144.89	\$64,839.84	\$3,800.00	\$61,039.84	9.9	51,838
ECM 2	Retrofit Fixtures with LED Lamps	Yes	59,603	17.9	0.0	\$7,114.72	\$54,854.34	\$8,400.00	\$46,454.34	6.5	60,020
Lighting Control Measures			8,006	2.1	0.0	\$955.70	\$12,432.00	\$880.00	\$11,552.00	12.1	8,062
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	6,003	1.6	0.0	\$716.57	\$9,032.00	\$880.00	\$8,152.00	11.4	6,045
ECM 4	Install High/Low Lighting Controls	Yes	2,003	0.5	0.0	\$239.12	\$3,400.00	\$0.00	\$3,400.00	14.2	2,017
Motor Upgrades			853	0.2	0.0	\$101.81	\$3,782.84	\$0.00	\$3,782.84	37.2	859
ECM 5	Premium Efficiency Motors	Yes	853	0.2	0.0	\$101.81	\$3,782.84	\$0.00	\$3,782.84	37.2	859
Variable Frequency Drive (VFD) Measures			35,728	3.7	0.0	\$4,264.78	\$10,388.90	\$0.00	\$10,388.90	2.4	35,978
ECM 6	Install VFDs on Hot Water Pumps	Yes	35,728	3.7	0.0	\$4,264.78	\$10,388.90	\$0.00	\$10,388.90	2.4	35,978
Electric Unitary HVAC Measures			18,892	12.6	0.0	\$2,255.12	\$589,727.52	\$57,354.00	\$532,373.52	236.1	19,024
	Install High Efficiency Electric AC	No	4,354	2.8	0.0	\$519.75	\$27,227.52	\$1,104.00	\$26,123.52	50.3	4,385
	Install High Efficiency Heat Pumps	No	14,538	9.8	0.0	\$1,735.37	\$562,500.00	\$56,250.00	\$506,250.00	291.7	14,640
Plug Load Equipment Control - Vending Machine			1,612	0.0	0.0	\$192.40	\$230.00	\$0.00	\$230.00	1.2	1,623
ECM 7	Vending Machine Control	Yes	1,612	0.0	0.0	\$192.40	\$230.00	\$0.00	\$230.00	1.2	1,623
TOTALS			176,172	43.2	0.0	\$21,029.41	\$736,255.44	\$70,434.00	\$665,821.44	31.7	177,403
TOTAL OF ALL RECOMMENDED ECMS			157,280	31	0	\$ 18,774.29	\$ 146,527.92	\$ 13,080.00	\$ 133,447.92	7.1	158,379

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

Crawford Rodriguez Elementary School



Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Natural Gas Savings (MMBtu)	Annual N/A Savings (MMBtu)	Annual N/A Savings (MMBtu)	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			199,266	41.6	0.0	0.0	0.0	0.0	\$22,787.34	\$198,603.87	\$22,745.00	\$175,858.87	7.7	200,659
ECM 1	Install LED Fixtures	Yes	80,938	13.5	0.0	0.0	0.0	0.0	\$9,255.75	\$104,581.88	\$8,950.00	\$95,631.88	10.3	81,503
ECM 2	Retrofit Fixtures with LED Lamps	Yes	118,328	28.1	0.0	0.0	0.0	0.0	\$13,531.60	\$94,021.99	\$13,795.00	\$80,226.99	5.9	119,155
Lighting Control Measures			32,026	7.6	0.0	0.0	0.0	0.0	\$3,662.38	\$62,690.00	\$4,710.00	\$57,980.00	15.8	32,250
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	29,348	7.0	0.0	0.0	0.0	0.0	\$3,356.09	\$41,690.00	\$4,710.00	\$36,980.00	11.0	29,553
	Install High/Low Lighting Controls	No	2,678	0.6	0.0	0.0	0.0	0.0	\$306.29	\$21,000.00	\$0.00	\$21,000.00	68.6	2,697
Motor Upgrades			2,241	0.5	0.0	0.0	0.0	0.0	\$256.31	\$9,224.40	\$0.00	\$9,224.40	36.0	2,257
	Premium Efficiency Motors	No	2,241	0.5	0.0	0.0	0.0	0.0	\$256.31	\$9,224.40	\$0.00	\$9,224.40	36.0	2,257
Variable Frequency Drive (VFD) Measures			139,906	17.2	0.0	0.0	0.0	0.0	\$15,999.19	\$61,312.25	\$6,440.00	\$54,872.25	3.4	140,884
ECM 4	Install VFDs on Constant Volume (CV) HVAC	Yes	34,948	8.6	0.0	0.0	0.0	0.0	\$3,996.56	\$27,648.45	\$5,240.00	\$22,408.45	5.6	35,193
ECM 5	Install VFDs on Chilled Water Pumps	Yes	71,340	7.3	0.0	0.0	0.0	0.0	\$8,158.22	\$20,777.80	\$0.00	\$20,777.80	2.5	71,839
ECM 6	Install VFDs on Hot Water Pumps	Yes	9,953	1.3	0.0	0.0	0.0	0.0	\$1,138.17	\$6,551.70	\$0.00	\$6,551.70	5.8	10,022
ECM 7	Install VFDs on Cooling Tower Fans	Yes	23,665	0.0	0.0	0.0	0.0	0.0	\$2,706.23	\$6,334.30	\$1,200.00	\$5,134.30	1.9	23,830
Electric Unitary HVAC Measures			2,089	1.2	0.0	0.0	0.0	0.0	\$238.84	\$5,236.77	\$322.00	\$4,914.77	20.6	2,103
ECM 8	Install High Efficiency Electric AC	Yes	2,089	1.2	0.0	0.0	0.0	0.0	\$238.84	\$5,236.77	\$322.00	\$4,914.77	20.6	2,103
Electric Chiller Replacement			251,104	71.6	0.0	0.0	0.0	0.0	\$28,715.45	\$362,990.00	\$21,500.00	\$341,490.00	11.9	252,860
ECM 9	Install High Efficiency Chillers	Yes	251,104	71.6	0.0	0.0	0.0	0.0	\$28,715.45	\$362,990.00	\$21,500.00	\$341,490.00	11.9	252,860
Gas Heating (HVAC/Process) Replacement			0	0.0	722.9	0.0	0.0	722.9	\$8,517.21	\$76,779.28	\$8,844.00	\$67,935.28	8.0	84,643
ECM 10	Install High Efficiency Hot Water Boilers	Yes	0	0.0	722.9	0.0	0.0	722.9	\$8,517.21	\$76,779.28	\$8,844.00	\$67,935.28	8.0	84,643
Domestic Water Heating Upgrade			0	0.0	8.1	0.0	0.0	8.1	\$95.40	\$143.40	\$0.00	\$143.40	1.5	948
ECM 11	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	8.1	0.0	0.0	8.1	\$95.40	\$143.40	\$0.00	\$143.40	1.5	948
Plug Load Equipment Control - Vending Machine			3,224	0.0	0.0	0.0	0.0	0.0	\$368.65	\$460.00	\$0.00	\$460.00	1.2	3,246
ECM 12	Vending Machine Control	Yes	3,224	0.0	0.0	0.0	0.0	0.0	\$368.65	\$460.00	\$0.00	\$460.00	1.2	3,246
TOTALS			629,855	139.6	731.0	0.0	0.0	731.0	\$80,640.77	\$777,439.96	\$64,561.00	\$712,878.96	8.8	719,850
TOTAL OF ALL RECOMMENDED ECMS			624,936	138	731	0	0	731	\$ 80,078.17	\$ 747,215.56	\$ 64,561.00	\$ 682,654.56	8.5	714,896

Lucy N. Holman Elementary School



Energy Conservation Measure		Recommend?	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			123,233	24.7	0.0	\$16,800.64	\$151,897.11	\$12,030.00	\$139,867.11	8.3	124,095
ECM 1	Install LED Fixtures	Yes	42,763	6.2	0.0	\$5,830.00	\$103,895.73	\$6,100.00	\$97,795.73	16.8	43,062
ECM 2	Retrofit Fixtures with LED Lamps	Yes	80,470	18.6	0.0	\$10,970.64	\$48,001.39	\$5,930.00	\$42,071.39	3.8	81,033
Lighting Control Measures			23,022	5.3	0.0	\$3,138.64	\$31,866.00	\$5,295.00	\$26,571.00	8.5	23,183
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	20,635	4.7	0.0	\$2,813.21	\$26,466.00	\$5,295.00	\$21,171.00	7.5	20,779
ECM 4	Install High/Low Lighting Controls	Yes	2,387	0.5	0.0	\$325.43	\$5,400.00	\$0.00	\$5,400.00	16.6	2,404
Variable Frequency Drive (VFD) Measures			15,851	3.0	0.0	\$2,161.00	\$18,368.32	\$1,040.00	\$17,328.32	8.0	15,962
ECM 5	Install VFDs on Constant Volume (CV) HVAC	Yes	5,898	1.8	0.0	\$804.11	\$11,816.62	\$1,040.00	\$10,776.62	13.4	5,939
ECM 6	Install VFDs on Hot Water Pumps	Yes	9,953	1.3	0.0	\$1,356.89	\$6,551.70	\$0.00	\$6,551.70	4.8	10,022
Electric Unitary HVAC Measures			64,564	22.5	0.0	\$8,802.19	\$247,463.01	\$8,062.50	\$239,400.51	27.2	65,016
	Install High Efficiency Electric AC	No	3,387	2.0	0.0	\$461.78	\$22,928.49	\$934.50	\$21,993.99	47.6	3,411
	Install High Efficiency Heat Pumps	No	61,177	20.5	0.0	\$8,340.41	\$224,534.53	\$7,128.00	\$217,406.53	26.1	61,605
Domestic Water Heating Upgrade			9,489	0.0	0.0	\$1,293.70	\$279.63	\$0.00	\$279.63	0.2	9,556
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	9,489	0.0	0.0	\$1,293.70	\$279.63	\$0.00	\$279.63	0.2	9,556
TOTALS			236,160	55.5	0.0	\$32,196.16	\$449,874.08	\$26,427.50	\$423,446.58	13.2	237,811
TOTAL OF ALL RECOMMENDED ECMS			171,595	33	0	\$ 23,393.97	\$ 202,411.06	\$ 18,365.00	\$ 184,046.06	7.9	172,795
TOTAL OF ALL NON-RECOMMENDED ECMS			64,564	22	0	\$ 8,802.19	\$ 247,463.01	\$ 8,062.50	\$ 239,400.51	27.2	65,016

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

Sylvia Rosenauer Elementary School



Energy Conservation Measure		Recommend?	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			37,153	13.3	0.0	\$4,410.70	\$37,167.36	\$6,760.00	\$30,407.36	6.9	37,413
ECM 1	Install LED Fixtures	Yes	5,762	0.7	0.0	\$684.09	\$3,125.42	\$800.00	\$2,325.42	3.4	5,803
ECM 2	Retrofit Fixtures with LED Lamps	Yes	31,391	12.6	0.0	\$3,726.61	\$34,041.95	\$5,960.00	\$28,081.95	7.5	31,610
Lighting Control Measures			7,995	3.2	0.0	\$949.16	\$11,960.00	\$1,110.00	\$10,850.00	11.4	8,051
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	7,524	3.0	0.0	\$893.27	\$10,960.00	\$1,110.00	\$9,850.00	11.0	7,577
ECM 4	Install High/Low Lighting Controls	Yes	471	0.2	0.0	\$55.89	\$1,000.00	\$0.00	\$1,000.00	17.9	474
Electric Unitary HVAC Measures			12,677	11.6	0.0	\$1,505.01	\$112,292.04	\$6,578.00	\$105,714.04	70.2	12,766
	Install High Efficiency Electric AC	No	12,677	11.6	0.0	\$1,505.01	\$112,292.04	\$6,578.00	\$105,714.04	70.2	12,766
HVAC System Improvements			981	0.2	0.0	\$116.41	\$500.00	\$250.00	\$250.00	2.1	987
ECM 5	Install Dual Enthalpy Outside Economizer Control	Yes	981	0.2	0.0	\$116.41	\$500.00	\$250.00	\$250.00	2.1	987
Domestic Water Heating Upgrade			0	0.0	40.7	\$569.13	\$5,790.51	\$100.00	\$5,690.51	10.0	4,764
	Install High Efficiency Gas Water Heater	No	0	0.0	3.8	\$53.59	\$5,625.60	\$100.00	\$5,525.60	103.1	449
ECM 6	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	36.9	\$515.53	\$164.91	\$0.00	\$164.91	0.3	4,316
Plug Load Equipment Control - Vending Machine			1,612	0.0	0.0	\$191.35	\$230.00	\$0.00	\$230.00	1.2	1,623
ECM 7	Vending Machine Control	Yes	1,612	0.0	0.0	\$191.35	\$230.00	\$0.00	\$230.00	1.2	1,623
TOTALS			60,418	28.4	40.7	\$7,741.76	\$167,939.91	\$14,798.00	\$153,141.91	19.8	65,604
TOTAL OF ALL RECOMMENDED MEASURES			47,740	17	37	6,183	50,022	8,120	41,902	6.8	52,390
TOTAL OF ALL NON-RECOMMENDED MEASURES			12,677	12	4	1,559	117,918	6,678	111,240	71.4	13,214

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

Switlik Elementary School



Energy Conservation Measure		Recommend?	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			168,738	35.8	0.0	\$20,574.37	\$191,934.47	\$19,545.00	\$172,389.47	8.4	169,918
ECM 1	Install LED Fixtures	Yes	58,809	9.1	0.0	\$7,170.67	\$118,934.17	\$6,530.00	\$112,404.17	15.7	59,221
ECM 2	Retrofit Fixtures with LED Lamps	Yes	109,929	26.7	0.0	\$13,403.70	\$73,000.30	\$13,015.00	\$59,985.30	4.5	110,697
Lighting Control Measures			29,922	7.3	0.0	\$3,648.36	\$45,052.00	\$2,795.00	\$42,257.00	11.6	30,131
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	27,347	6.7	0.0	\$3,334.42	\$41,252.00	\$2,795.00	\$38,457.00	11.5	27,538
ECM 4	Install High/Low Lighting Controls	Yes	2,575	0.6	0.0	\$313.94	\$3,800.00	\$0.00	\$3,800.00	12.1	2,593
Motor Upgrades			641	0.2	0.0	\$78.20	\$3,335.58	\$0.00	\$3,335.58	42.7	646
	Premium Efficiency Motors	No	641	0.2	0.0	\$78.20	\$3,335.58	\$0.00	\$3,335.58	42.7	646
Variable Frequency Drive (VFD) Measures			7,480	2.0	0.0	\$912.10	\$16,888.76	\$1,040.00	\$15,848.76	17.4	7,533
	Install VFDs on Constant Volume (CV) HVAC	No	5,397	1.8	0.0	\$658.04	\$11,816.62	\$1,040.00	\$10,776.62	16.4	5,435
	Install VFDs on Hot Water Pumps	No	2,084	0.3	0.0	\$254.07	\$5,072.13	\$0.00	\$5,072.13	20.0	2,098
Electric Unitary HVAC Measures			80,181	43.0	0.0	\$9,776.54	\$328,346.25	\$17,884.09	\$310,462.16	31.8	80,742
	Install High Efficiency Electric AC	No	80,181	43.0	0.0	\$9,776.54	\$328,346.25	\$17,884.09	\$310,462.16	31.8	80,742
Gas Heating (HVAC/Process) Replacement			0	0.0	57.2	\$714.78	\$26,159.48	\$2,040.50	\$24,118.98	33.7	6,701
	Install High Efficiency Hot Water Boilers	No	0	0.0	57.2	\$714.78	\$26,159.48	\$2,040.50	\$24,118.98	33.7	6,701
Domestic Water Heating Upgrade			0	0.0	10.6	\$132.68	\$4,449.00	\$150.00	\$4,299.00	32.4	1,244
	Install High Efficiency Gas Water Heater	No	0	0.0	10.6	\$132.68	\$4,449.00	\$150.00	\$4,299.00	32.4	1,244
Plug Load Equipment Control - Vending Machine			1,612	0.0	0.0	\$196.53	\$230.00	\$0.00	\$230.00	1.2	1,623
ECM 5	Vending Machine Control	Yes	1,612	0.0	0.0	\$196.53	\$230.00	\$0.00	\$230.00	1.2	1,623
TOTALS			288,574	88.2	67.9	\$36,033.56	\$616,395.53	\$43,454.59	\$572,940.94	15.9	298,537
TOTAL OF ALL RECOMMENDED MEASURES			200,271	43	0	24,419	237,216	22,340	214,876	8.8	201,672
TOTAL OF ALL NON-RECOMMENDED MEASURES			88,303	45	68	11,614	379,179	21,115	358,064	30.8	96,865

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

Board of Education Administrative Offices



Energy Conservation Measure		Recommend?	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			24,649	6.2	0.0	\$3,029.22	\$16,381.58	\$3,035.00	\$13,346.58	4.4	24,821
ECM 1	Install LED Fixtures	Yes	5,432	0.8	0.0	\$667.58	\$3,906.38	\$600.00	\$3,306.38	5.0	5,470
ECM 2	Retrofit Fixtures with LED Lamps	Yes	19,217	5.3	0.0	\$2,361.64	\$12,475.20	\$2,435.00	\$10,040.20	4.3	19,351
Lighting Control Measures			5,161	1.4	0.0	\$634.24	\$5,712.00	\$600.00	\$5,112.00	8.1	5,197
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	4,896	1.4	0.0	\$601.64	\$4,712.00	\$600.00	\$4,112.00	6.8	4,930
	Install High/Low Lighting Controls	No	265	0.1	0.0	\$32.60	\$1,000.00	\$0.00	\$1,000.00	30.7	267
Electric Unitary HVAC Measures			5,338	3.2	0.0	\$656.06	\$42,123.61	\$985.50	\$41,138.11	62.7	5,376
	Install High Efficiency Electric AC	No	5,338	3.2	0.0	\$656.06	\$42,123.61	\$985.50	\$41,138.11	62.7	5,376
HVAC System Improvements			2,164	0.5	0.0	\$265.93	\$750.00	\$250.00	\$500.00	1.9	2,179
ECM 4	Install Dual Enthalpy Outside Economizer Control	Yes	2,164	0.5	0.0	\$265.93	\$750.00	\$250.00	\$500.00	1.9	2,179
Plug Load Equipment Control - Vending Machine			1,612	0.0	0.0	\$198.09	\$230.00	\$0.00	\$230.00	1.2	1,623
ECM 5	Vending Machine Control	Yes	1,612	0.0	0.0	\$198.09	\$230.00	\$0.00	\$230.00	1.2	1,623
TOTALS			38,924	11.3	0.0	\$4,951.90	\$65,197.19	\$4,870.50	\$60,326.69	12.2	39,196
TOTAL OF ALL RECOMMENDED MEASURES			33,320	8	0	4,095	22,074	3,885	18,189	4.4	33,553
TOTAL OF ALL NON-RECOMMENDED MEASURES			5,604	3	0	689	43,124	986	42,138	61.2	5,643

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

Board of Education Transportation Facility



Energy Conservation Measure		Recommend?	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			37,152	6.5	0.0	\$4,437.19	\$72,780.52	\$4,380.00	\$68,400.52	15.4	37,412
ECM 1	Install LED Fixtures	Yes	30,594	5.2	0.0	\$3,653.98	\$69,815.20	\$3,900.00	\$65,915.20	18.0	30,808
ECM 2	Retrofit Fixtures with LED Lamps	Yes	6,558	1.3	0.0	\$783.22	\$2,965.32	\$480.00	\$2,485.32	3.2	6,604
Lighting Control Measures			41	0.0	0.0	\$4.95	\$116.00	\$0.00	\$116.00	23.5	42
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	41	0.0	0.0	\$4.95	\$116.00	\$0.00	\$116.00	23.5	42
Electric Unitary HVAC Measures			4,457	1.1	0.0	\$532.33	\$7,481.10	\$460.00	\$7,021.10	13.2	4,488
ECM 4	Install High Efficiency Electric AC	Yes	4,457	1.1	0.0	\$532.33	\$7,481.10	\$460.00	\$7,021.10	13.2	4,488
Gas Heating (HVAC/Process) Replacement			0	0.0	74.8	\$956.77	\$8,076.68	\$630.00	\$7,446.68	7.8	8,757
ECM 5	Install High Efficiency Hot Water Boilers	Yes	0	0.0	74.8	\$956.77	\$8,076.68	\$630.00	\$7,446.68	7.8	8,757
Plug Load Equipment Control - Vending Machine			1,612	0.0	0.0	\$192.51	\$230.00	\$0.00	\$230.00	1.2	1,623
ECM 6	Vending Machine Control	Yes	1,612	0.0	0.0	\$192.51	\$230.00	\$0.00	\$230.00	1.2	1,623
TOTALS			43,263	7.6	74.8	\$6,123.74	\$88,684.31	\$5,470.00	\$83,214.31	13.6	52,322

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

Board of Education Maintenance Building



Energy Conservation Measure		Recommend?	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			5,479	1.1	0.0	\$708.49	\$3,178.84	\$680.00	\$2,498.84	3.5	5,517
ECM 1	Install LED Fixtures	Yes	3,066	0.5	0.0	\$396.47	\$1,562.71	\$400.00	\$1,162.71	2.9	3,087
ECM 2	Retrofit Fixtures with LED Lamps	Yes	2,413	0.6	0.0	\$312.02	\$1,616.13	\$280.00	\$1,336.13	4.3	2,430
Lighting Control Measures			92	0.0	0.0	\$11.88	\$232.00	\$0.00	\$232.00	19.5	93
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	92	0.0	0.0	\$11.88	\$232.00	\$0.00	\$232.00	19.5	93
Gas Heating (HVAC/Process) Replacement			0	0.0	11.7	\$158.16	\$1,789.79	\$0.00	\$1,789.79	11.3	1,370
ECM 4	Install High Efficiency Unit Heaters	Yes	0	0.0	11.7	\$158.16	\$1,789.79	\$0.00	\$1,789.79	11.3	1,370
TOTALS			5,571	1.1	11.7	\$878.53	\$5,200.63	\$680.00	\$4,520.63	5.1	6,980

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

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

PROGRAMS

Equipment Rebates:

- SmartStart Retrofit
- SmartStart New Construction
- Direct Install
- Large Energy Users

Whole Buildings:

- Pay for Performance Existing Buildings
- Pay for Performance New Construction

Energy Generation:

- Combined Heat and Power (CHP)

* eligible programs are highlighted in yellow

SmartStart: Overview



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

SmartStart – Financing Option



- NJNG provides 0% financing options for SmartStart that will cover up to \$130,000 per year.
- 10 year term-repayments made on regular monthly gas bill
- Need to review project with NJNG to confirm project qualifies.
- The SAVEGREEN program can help with a consultation to discuss your Commercial Energy Efficiency Project.



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 a peak 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 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

Hutchinson Mechanical Services

Ed Hutchinson

856-429-5828 x215

edhutchinson@hutchbiz.com

Direct Install – Financing Option



- Eligible NJNG customers can finance the remaining 30 percent balance at 0% APR through the “SAVEGREEN Project® On-Bill Repayment Program” (OBRP) for 36 months.
- For measures that may not qualify for Direct Install, NJNG also offers financing options for SmartStart that will cover up to \$130,000 per year.



Direct Install – Financing Option



- Questions? Contact:

Jerry Ryan

Energy Efficiency Operations Manager

New Jersey Natural Gas

732-433-4362 (cell)

732 378 4920 (office)

jryan@njng.com



P4P Existing Buildings: Overview



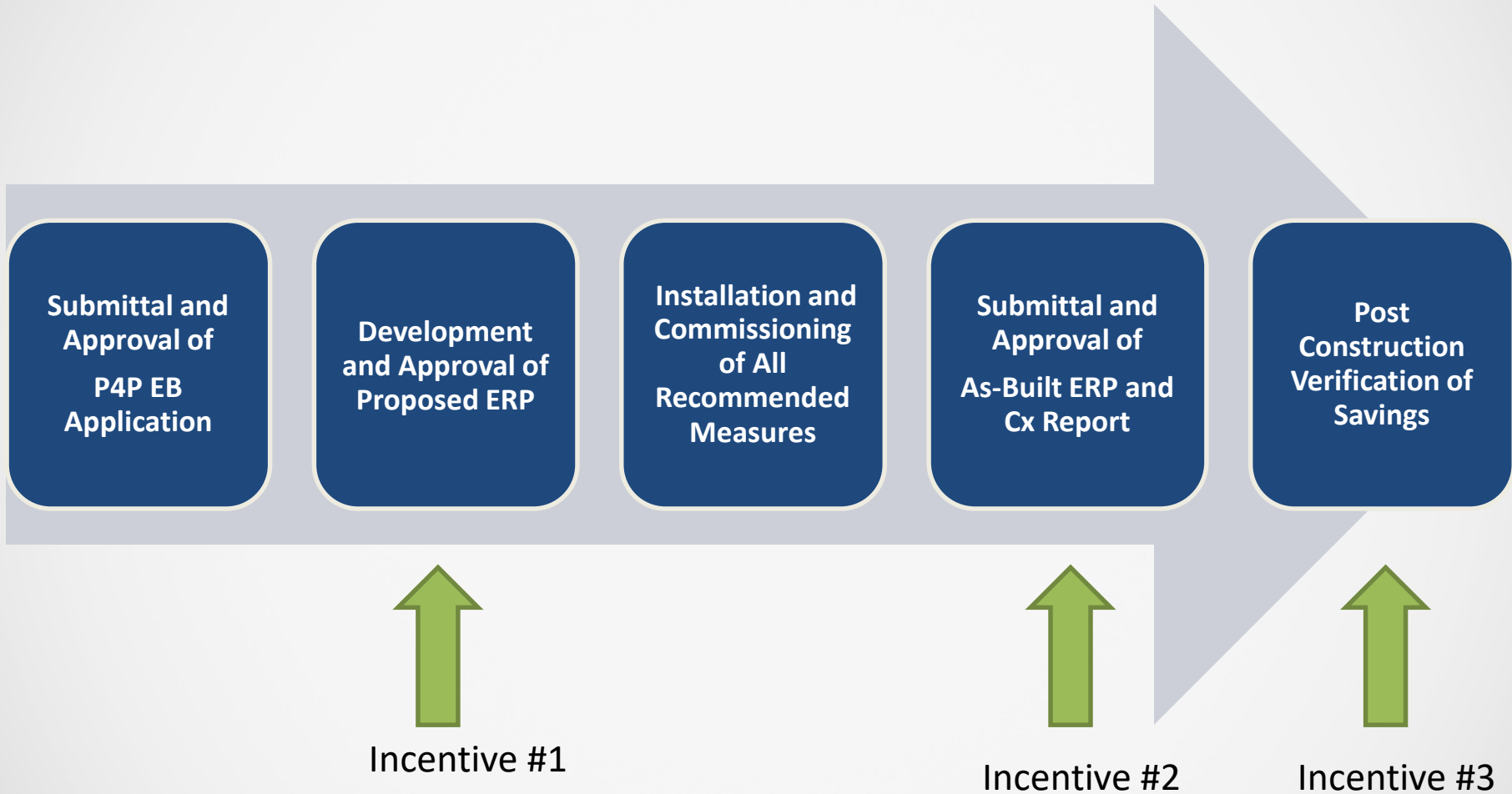
- Comprehensive, whole-building approach to saving energy in existing or new facilities
- Customer chooses from network of pre-approved participating Partners
- Incentives up to \$2 million per project
 - \$1 million for electric measures
 - \$1 million for gas measures
- \$4 million annual entity cap per fiscal year
- Incentives up to 50% of total project cost
- Incentives paid in three installments at milestones

P4P Existing Buildings: Overview



- Open to Commercial and Industrial facilities with annual peak demand of at least 200 kW in previous year
- Minimum savings 15% from existing energy use
- Must have at least two unique measures per project
- No more than 50% of total savings may come from lighting measures
 - Lighting savings up to 70% may be considered with minimum savings target increasing up to 35%

P4P EB: PROCESS



P4P EB: INCENTIVES



Incentive #1: Energy Reduction Plan			
Incentive Amount:		\$0.15	per sq ft
Minimum Incentive:		\$7,500	
Maximum Incentive:		\$50,000	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

Recommended NJCEP Incentives per Building



Entity Name	SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings
Jackson Liberty High School	X			
Jackson Memorial High School	X			
Carl W. Goetz Middle School	X			X
Christa McCauliffe Middle School	X			X
Howard C. Johnson Elementary School	X			X
Elms Elementary School	X			
Crawford Rodriguez Elementary School	X			X
Lucy N. Holman Elementary School	X	X		
Sylvia Rosenauer Elementary School	X		X	
Switlik Elementary School	X			
Jackson Township BOE Administration Office	X		X	
Jackson Township BOE Transportation Facility	X		X	
Jackson BOE Maintenance Building	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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ESIP@bpu.nj.gov

Questions



?



FOR MORE INFORMATION

Visit NJCleanEnergy.com

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