

New Jersey's Clean Energy Program

LGEA Exit Meeting for:
Montville Township Public Schools

Smruti Srinivasan, TRC

November 17, 2017

Introductions



Montville Township Public Schools

- Superintendent: Rene Rovtar
- Business Administrator: Katine Slunt
- Facilities Manager: Steve Toth
- Facilities Office: Nicole Mangili

NJ Clean Energy Program – TRC & BPU

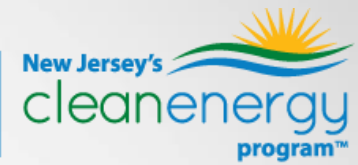
- Auditor: Smruti Srinivasan
- Case Manager: Ashley Miller
- ESIP Coordinator: Mike Thulen

Agenda



- Overview of LGEA process (application to deliverable)
- 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 Montville Township Public Schools

Process to Draft Report



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

(1) Montville Township High School



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

(1) Montville Township High School

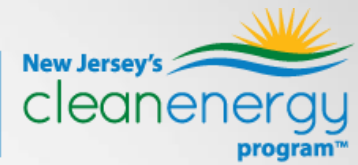


Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades			284,682	65.1	0.0	\$33,063.97	\$177,953.98	\$29,460.00	\$148,493.98	4.5	286,672
ECM 1	Install LED Fixtures	Yes	52,260	7.4	0.0	\$6,069.69	\$23,124.47	\$4,390.00	\$18,734.47	3.1	52,626
ECM 2	Retrofit Fixtures with LED Lamps	Yes	232,300	57.7	0.0	\$26,980.23	\$154,614.40	\$25,070.00	\$129,544.40	4.8	233,925
ECM 3	Install LED Exit Signs	Yes	121	0.0	0.0	\$14.04	\$215.11	\$0.00	\$215.11	15.3	122
Lighting Control Measures			32,629	9.4	0.0	\$3,789.70	\$28,908.00	\$4,060.00	\$24,848.00	6.6	32,858
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	32,629	9.4	0.0	\$3,789.70	\$28,908.00	\$4,060.00	\$24,848.00	6.6	32,858
Variable Frequency Drive (VFD) Measures			81,252	13.2	0.0	\$9,436.89	\$34,290.55	\$5,040.00	\$29,250.55	3.1	81,820
ECM 5	Install VFDs on Constant Volume (CV) HVAC	Yes	33,922	8.4	0.0	\$3,939.86	\$21,621.95	\$5,040.00	\$16,581.95	4.2	34,159
ECM 6	Install VFDs on Hot Water Pumps	Yes	47,330	4.8	0.0	\$5,497.04	\$12,668.60	\$0.00	\$12,668.60	2.3	47,661
Electric Unitary HVAC Measures			22,426	12.5	0.0	\$2,604.65	\$60,054.98	\$2,960.00	\$57,094.98	21.9	22,583
ECM 7	Install High Efficiency Electric AC	Yes	22,426	12.5	0.0	\$2,604.65	\$60,054.98	\$2,960.00	\$57,094.98	21.9	22,583
HVAC System Improvements			7,164	1.6	0.0	\$832.09	\$1,400.00	\$500.00	\$900.00	1.1	7,214
ECM 8	Install Dual Enthalpy Outside Economizer Control	Yes	7,164	1.6	0.0	\$832.09	\$1,400.00	\$500.00	\$900.00	1.1	7,214
Domestic Water Heating Upgrade			0	0.0	110.4	\$1,170.85	\$451.71	\$0.00	\$451.71	0.4	12,927
ECM 9	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	110.4	\$1,170.85	\$451.71	\$0.00	\$451.71	0.4	12,927
Food Service Equipment & Refrigeration Measures			0	0.0	603.6	\$6,401.40	\$45,074.06	\$2,750.00	\$42,324.06	6.6	70,674
ECM 10	Food Service Equipment Replacement	Yes	0	0.0	603.6	\$6,401.40	\$45,074.06	\$2,750.00	\$42,324.06	6.6	70,674
Plug Load Equipment Control - Vending Machine			14,507	0.0	0.0	\$1,684.85	\$2,070.00	\$0.00	\$2,070.00	1.2	14,608
ECM 11	Vending Machine Control	Yes	14,507	0.0	0.0	\$1,684.85	\$2,070.00	\$0.00	\$2,070.00	1.2	14,608
TOTALS			442,660	101.8	714.0	\$58,984.40	\$350,203.29	\$44,770.00	\$305,433.29	5.2	529,356

* - 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).

(2) Robert R. Lazar Middle School



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

(2) Robert R. Lazar Middle School



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		164,251	48.5	0.0	\$19,197.84	\$138,869.35	\$21,895.00	\$116,974.35	6.1	165,400
ECM 1	Install LED Fixtures	28,787	9.3	0.0	\$3,364.60	\$31,885.97	\$3,940.00	\$27,945.97	8.3	28,988
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	23,303	6.9	0.0	\$2,723.63	\$23,236.00	\$2,100.00	\$21,136.00	7.8	23,466
ECM 3	Retrofit Fixtures with LED Lamps	112,162	32.4	0.0	\$13,109.61	\$83,747.39	\$15,855.00	\$67,892.39	5.2	112,946
Lighting Control Measures		32,666	9.4	0.0	\$3,818.08	\$17,628.00	\$2,310.00	\$15,318.00	4.0	32,895
ECM 4	Install Occupancy Sensor Lighting Controls	29,607	8.6	0.0	\$3,460.48	\$16,584.00	\$2,310.00	\$14,274.00	4.1	29,814
ECM 5	Install High/Low Lighting Controls	3,060	0.8	0.0	\$357.60	\$1,044.00	\$0.00	\$1,044.00	2.9	3,081
Variable Frequency Drive (VFD) Measures		5,720	1.9	0.0	\$668.58	\$7,213.60	\$0.00	\$7,213.60	10.8	5,760
ECM 6	Install VFDs on Hot Water Pumps	5,720	1.9	0.0	\$668.58	\$7,213.60	\$0.00	\$7,213.60	10.8	5,760
Electric Unitary HVAC Measures		148,961	100.2	0.0	\$17,410.67	\$254,296.82	\$13,733.00	\$240,563.82	13.8	150,002
ECM 7	Install High Efficiency Electric AC	148,961	100.2	0.0	\$17,410.67	\$254,296.82	\$13,733.00	\$240,563.82	13.8	150,002
Gas Heating (HVAC/Process) Replacement		0	0.0	14.6	\$157.09	\$2,265.73	\$400.00	\$1,865.73	11.9	1,709
ECM 8	Install High Efficiency Furnaces	0	0.0	14.6	\$157.09	\$2,265.73	\$400.00	\$1,865.73	11.9	1,709
HVAC System Improvements		20,061	4.5	0.0	\$2,344.79	\$5,300.00	\$1,750.00	\$3,550.00	1.5	20,202
ECM 9	Install Dual Enthalpy Outside Economizer Control	20,061	4.5	0.0	\$2,344.79	\$5,300.00	\$1,750.00	\$3,550.00	1.5	20,202
Domestic Water Heating Upgrade		0	0.0	35.4	\$381.35	\$222.27	\$0.00	\$222.27	0.6	4,149
ECM 10	Install Low-Flow Domestic Hot Water Devices	0	0.0	35.4	\$381.35	\$222.27	\$0.00	\$222.27	0.6	4,149
Plug Load Equipment Control - Vending Machine		6,790	0.0	0.0	\$793.61	\$1,150.00	\$0.00	\$1,150.00	1.4	6,837
ECM 11	Vending Machine Control	6,790	0.0	0.0	\$793.61	\$1,150.00	\$0.00	\$1,150.00	1.4	6,837
TOTALS		378,450	164.5	50.0	\$44,772.00	\$426,945.78	\$40,088.00	\$386,857.78	8.6	386,954

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

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

(3) Cedar Hill Elementary School



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

(3) Cedar Hill 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			56,409	15.3	0.0	\$7,285.87	\$40,137.79	\$7,490.00	\$32,647.79	4.5	56,803
ECM 1	Install LED Fixtures	Yes	12,300	1.6	0.0	\$1,588.74	\$5,078.80	\$1,300.00	\$3,778.80	2.4	12,386
ECM 2	Retrofit Fixtures with LED Lamps	Yes	44,108	13.7	0.0	\$5,697.13	\$35,058.99	\$6,190.00	\$28,868.99	5.1	44,417
Lighting Control Measures			11,874	2.8	0.0	\$1,533.65	\$7,328.00	\$1,330.00	\$5,998.00	3.9	11,957
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	6,723	2.1	0.0	\$868.42	\$6,828.00	\$900.00	\$5,928.00	6.8	6,770
ECM 4	Install Daylight Dimming Controls	Yes	5,150	0.7	0.0	\$665.23	\$500.00	\$430.00	\$70.00	0.1	5,186
Variable Frequency Drive (VFD) Measures			19,014	2.4	0.0	\$2,455.88	\$17,831.92	\$0.00	\$17,831.92	7.3	19,147
ECM 5	Install VFDs on Hot Water Pumps	Yes	19,014	2.4	0.0	\$2,455.88	\$17,831.92	\$0.00	\$17,831.92	7.3	19,147
Electric Unitary HVAC Measures			11,398	10.1	0.0	\$1,472.19	\$68,483.84	\$3,761.00	\$64,722.84	44.0	11,478
	Install High Efficiency Electric AC	No	11,398	10.1	0.0	\$1,472.19	\$68,483.84	\$3,761.00	\$64,722.84	44.0	11,478
Domestic Water Heating Upgrade			0	0.0	25.9	\$285.81	\$114.72	\$0.00	\$114.72	0.4	3,028
ECM 6	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	25.9	\$285.81	\$114.72	\$0.00	\$114.72	0.4	3,028
Plug Load Equipment Control - Vending Machine			1,612	0.0	0.0	\$208.19	\$230.00	\$0.00	\$230.00	1.1	1,623
ECM 7	Vending Machine Control	Yes	1,612	0.0	0.0	\$208.19	\$230.00	\$0.00	\$230.00	1.1	1,623
TOTAL OF EVALUATED MEASURES			100,306	30.5	25.9	\$13,241.59	\$134,126.27	\$12,581.00	\$121,545.27	9.2	104,036
TOTAL OF ALL RECOMMENDED MEASURES			88,908.4	20.4	25.9	11,769.40	65,642.43	8,820.00	56,822.43	4.83	92,558.46

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

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

(4) Hillsdale Elementary School



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

(4) Hillsdale 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			78,094	21.6	0.0	\$9,346.19	\$59,552.62	\$3,405.00	\$56,147.62	6.0	78,640
ECM 1	Install LED Fixtures	Yes	2,327	0.3	0.0	\$278.50	\$1,172.03	\$300.00	\$872.03	3.1	2,343
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and	Yes	52,828	14.4	0.0	\$6,322.33	\$41,069.63	\$0.00	\$41,069.63	6.5	53,197
ECM 3	Retrofit Fixtures with LED Lamps	Yes	22,939	6.8	0.0	\$2,745.36	\$17,310.96	\$3,105.00	\$14,205.96	5.2	23,100
Lighting Control Measures			4,098	1.1	0.0	\$490.50	\$4,398.00	\$585.00	\$3,813.00	7.8	4,127
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	4,098	1.1	0.0	\$490.50	\$4,398.00	\$585.00	\$3,813.00	7.8	4,127
Electric Unitary HVAC Measures			11,830	8.7	0.0	\$1,415.79	\$38,901.72	\$2,392.00	\$36,509.72	25.8	11,913
	Install High Efficiency Electric AC	No	11,830	8.7	0.0	\$1,415.79	\$38,901.72	\$2,392.00	\$36,509.72	25.8	11,913
Domestic Water Heating Upgrade			4,197	0.0	0.0	\$502.25	\$136.23	\$0.00	\$136.23	0.3	4,226
ECM 5	Install Low-Flow Domestic Hot Water Devices	Yes	4,197	0.0	0.0	\$502.25	\$136.23	\$0.00	\$136.23	0.3	4,226
TOTAL OF ALL ECMS EVALUATED			98,219	31.4	0.0	\$11,754.73	\$102,988.57	\$6,382.00	\$96,606.57	8.2	98,906
TOTAL OF ALL ECMS RECOMMENDED			86,389	23	0	10,339	64,087	3,990	60,097	5.8	86,993

* - 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).

(5) Valley View Elementary School



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

(5) Valley View Elementary School

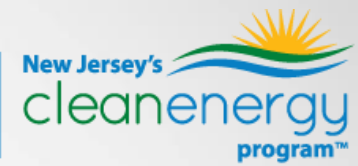


Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades			96,492	23.7	0.0	\$11,267.14	\$61,189.82	\$10,815.00	\$50,374.82	4.5	97,167
ECM 1	Install LED Fixtures	Yes	14,829	1.9	0.0	\$1,731.53	\$8,419.77	\$1,640.00	\$6,779.77	3.9	14,933
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	905	0.3	0.0	\$105.63	\$759.51	\$0.00	\$759.51	7.2	911
ECM 3	Retrofit Fixtures with LED Lamps	Yes	80,759	21.5	0.0	\$9,429.98	\$52,010.54	\$9,175.00	\$42,835.54	4.5	81,324
Lighting Control Measures			11,967	3.2	0.0	\$1,397.35	\$6,332.00	\$930.00	\$5,402.00	3.9	12,051
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	11,967	3.2	0.0	\$1,397.35	\$6,332.00	\$930.00	\$5,402.00	3.9	12,051
Variable Frequency Drive (VFD) Measures			26,958	3.0	0.0	\$3,147.78	\$18,493.82	\$0.00	\$18,493.82	5.9	27,146
ECM 5	Install VFDs on Hot Water Pumps	Yes	26,958	3.0	0.0	\$3,147.78	\$18,493.82	\$0.00	\$18,493.82	5.9	27,146
Electric Unitary HVAC Measures			23,792	14.1	0.0	\$2,778.14	\$83,206.27	\$4,126.00	\$79,080.27	28.5	23,959
	Install High Efficiency Electric AC	No	23,792	14.1	0.0	\$2,778.14	\$83,206.27	\$4,126.00	\$79,080.27	28.5	23,959
HVAC System Improvements			10,369	2.3	0.0	\$1,210.73	\$1,800.00	\$500.00	\$1,300.00	1.1	10,441
ECM 6	Install Dual Enthalpy Outside Economizer Control	Yes	10,369	2.3	0.0	\$1,210.73	\$1,800.00	\$500.00	\$1,300.00	1.1	10,441
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	25.6	\$280.53	\$179.25	\$0.00	\$179.25	0.6	3,002
TOTAL OF ALL EVALUATED ECMS			169,578	46.3	25.6	\$20,081.67	\$171,201.16	\$16,371.00	\$154,830.16	7.7	173,766
TOTAL OF ALL RECOMMENDED ECMS			135,417	30	0	15,812	86,016	11,745	74,271	4.7	136,364

* - 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).

(6) William Mason School



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

(6) William Mason 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			40,542	10.3	0.0	\$5,696.63	\$28,068.28	\$4,725.00	\$23,343.28	4.1	40,826
ECM 1	Install LED Fixtures	Yes	1,904	0.2	0.0	\$267.53	\$1,172.03	\$300.00	\$872.03	3.3	1,917
ECM 2	Retrofit Fixtures with LED Lamps	Yes	38,638	10.0	0.0	\$5,429.10	\$26,896.25	\$4,425.00	\$22,471.25	4.1	38,908
Lighting Control Measures			5,344	1.4	0.0	\$750.93	\$5,400.00	\$700.00	\$4,700.00	6.3	5,382
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	5,344	1.4	0.0	\$750.93	\$5,400.00	\$700.00	\$4,700.00	6.3	5,382
Variable Frequency Drive (VFD) Measures			10,091	1.3	0.0	\$1,417.88	\$11,473.01	\$0.00	\$11,473.01	8.1	10,161
ECM 4	Install VFDs on Hot Water Pumps	Yes	10,091	1.3	0.0	\$1,417.88	\$11,473.01	\$0.00	\$11,473.01	8.1	10,161
Electric Unitary HVAC Measures			4,665	2.8	0.0	\$655.54	\$24,687.63	\$1,518.00	\$23,169.63	35.3	4,698
	Install High Efficiency Electric AC	No	4,665	2.8	0.0	\$655.54	\$24,687.63	\$1,518.00	\$23,169.63	35.3	4,698
Plug Load Equipment Control - Vending Machine			1,612	0.0	0.0	\$226.48	\$230.00	\$0.00	\$230.00	1.0	1,623
ECM 5	Vending Machine Control	Yes	1,612	0.0	0.0	\$226.48	\$230.00	\$0.00	\$230.00	1.0	1,623
TOTAL OF ALL EVALUATED ECMS			62,255	15.7	0.0	\$8,747.45	\$69,858.92	\$6,943.00	\$62,915.92	7.2	62,690
TOTAL OF ALL RECOMMENDED ECMS			57,589	13	0	\$8,091.92	\$45,171.29	\$5,425.00	\$39,746.29	4.9	57,992

* - 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).

(7) Woodmont Elementary School



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

(7) Woodmont 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			50,124	13.7	0.0	\$6,293.01	\$35,790.72	\$5,830.00	\$29,960.72	4.8	50,474
ECM 1	Install LED Fixtures	Yes	5,319	0.7	0.0	\$667.81	\$1,562.71	\$400.00	\$1,162.71	1.7	5,356
ECM 2	Retrofit Fixtures with LED Lamps	Yes	44,805	13.0	0.0	\$5,625.21	\$34,228.01	\$5,430.00	\$28,798.01	5.1	45,118
Lighting Control Measures			10,228	2.8	0.0	\$1,284.18	\$8,438.00	\$1,285.00	\$7,153.00	5.6	10,300
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	8,274	2.5	0.0	\$1,038.81	\$8,218.00	\$1,105.00	\$7,113.00	6.8	8,332
ECM 4	Install Daylight Dimming Controls	Yes	1,954	0.3	0.0	\$245.37	\$220.00	\$180.00	\$40.00	0.2	1,968
Variable Frequency Drive (VFD) Measures			7,502	2.2	0.0	\$941.91	\$17,274.33	\$0.00	\$17,274.33	18.3	7,555
ECM 5	Install VFDs on Hot Water Pumps	Yes	7,502	2.2	0.0	\$941.91	\$17,274.33	\$0.00	\$17,274.33	18.3	7,555
Electric Unitary HVAC Measures			17,537	10.4	0.0	\$2,201.79	\$51,442.18	\$2,102.50	\$49,339.68	22.4	17,660
	Install High Efficiency Electric AC	No	17,537	10.4	0.0	\$2,201.79	\$51,442.18	\$2,102.50	\$49,339.68	22.4	17,660
HVAC System Improvements			6,300	1.4	0.0	\$790.99	\$2,750.00	\$1,000.00	\$1,750.00	2.2	6,344
ECM 6	Install Dual Enthalpy Outside Economizer Control	Yes	6,300	1.4	0.0	\$790.99	\$2,750.00	\$1,000.00	\$1,750.00	2.2	6,344
Domestic Water Heating Upgrade			0	0.0	15.5	\$179.94	\$71.70	\$0.00	\$71.70	0.4	1,810
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	15.5	\$179.94	\$71.70	\$0.00	\$71.70	0.4	1,810
Plug Load Equipment Control - Vending Machine			1,612	0.0	0.0	\$202.37	\$230.00	\$0.00	\$230.00	1.1	1,623
ECM 8	Vending Machine Control	Yes	1,612	0.0	0.0	\$202.37	\$230.00	\$0.00	\$230.00	1.1	1,623
TOTAL OF ALL EVALUATED ECMS			93,304	30.5	15.5	\$11,894.20	\$115,996.93	\$10,217.50	\$105,779.43	8.9	95,767
TOTAL OF ALL RECOMMENDED ECMS			75,767	20	15	9,692	64,555	8,115	56,440	5.8	78,107

* - 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).

(8) Board of Education Office



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

(8) Board of Education Office



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			13,302	3.1	0.0	\$1,476.98	\$6,320.80	\$1,175.00	\$5,145.80	3.5	13,395
ECM 1	Retrofit Fixtures with LED Lamps	Yes	13,302	3.1	0.0	\$1,476.98	\$6,320.80	\$1,175.00	\$5,145.80	3.5	13,395
Lighting Control Measures			2,154	0.5	0.0	\$239.21	\$1,776.00	\$260.00	\$1,516.00	6.3	2,169
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	2,154	0.5	0.0	\$239.21	\$1,776.00	\$260.00	\$1,516.00	6.3	2,169
Domestic Water Heating Upgrade			1,367	0.0	0.0	\$151.80	\$50.19	\$0.00	\$50.19	0.3	1,377
ECM 3	Install Low-Flow Domestic Hot Water Devices	Yes	1,367	0.0	0.0	\$151.80	\$50.19	\$0.00	\$50.19	0.3	1,377
TOTALS			16,823	3.7	0.0	\$1,867.99	\$8,146.99	\$1,435.00	\$6,711.99	3.6	16,941

* - 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).

Summary of Recommended ECMs – All Buildings



(See handout in folder)

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		783,896	201.3	0.0	\$93,627.63	\$547,883.37	\$84,795.00	\$463,088.37	4.9	789,377
ECM 1	Install LED Fixtures	117,726	21.5	0.0	\$13,968.40	\$72,415.78	\$12,270.00	\$60,145.78	4.3	118,549
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	77,035	21.6	0.0	\$9,151.59	\$65,065.14	\$2,100.00	\$62,965.14	6.9	77,574
ECM 3	Retrofit Fixtures with LED Lamps	589,014	158.2	0.0	\$70,493.60	\$410,187.34	\$70,425.00	\$339,762.34	4.8	593,132
ECM 4	Install LED Exit Signs	121	0.0	0.0	\$14.04	\$215.11	\$0.00	\$215.11	15.3	122
Lighting Control Measures		110,962	30.5	0.0	\$13,303.60	\$80,208.00	\$11,460.00	\$68,748.00	5.2	111,738
ECM 5	Install Occupancy Sensor Lighting Controls	100,798	28.8	0.0	\$12,035.40	\$78,444.00	\$10,850.00	\$67,594.00	5.6	101,503
ECM 6	Install Daylight Dimming Controls	7,105	0.9	0.0	\$910.60	\$720.00	\$610.00	\$110.00	0.1	7,154
ECM 7	Install High/Low Lighting Controls	3,060	0.8	0.0	\$357.60	\$1,044.00	\$0.00	\$1,044.00	2.9	3,081
Variable Frequency Drive (VFD) Measures		150,537	23.9	0.0	\$18,068.93	\$106,577.23	\$5,040.00	\$101,537.23	5.6	151,590
ECM 8	Install VFDs on Constant Volume (CV) HVAC	33,922	8.4	0.0	\$3,939.86	\$21,621.95	\$5,040.00	\$16,581.95	4.2	34,159
ECM 9	Install VFDs on Hot Water Pumps	116,615	15.6	0.0	\$14,129.07	\$84,955.28	\$0.00	\$84,955.28	6.0	117,430
Electric Unitary HVAC Measures		171,387	112.7	0.0	\$20,015.32	\$314,351.80	\$16,693.00	\$297,658.80	14.9	172,585
ECM 10	Install High Efficiency Electric AC	171,387	112.7	0.0	\$20,015.32	\$314,351.80	\$16,693.00	\$297,658.80	14.9	172,585
Gas Heating (HVAC/Process) Replacement		0	0.0	14.6	\$157.09	\$2,265.73	\$400.00	\$1,865.73	11.9	1,709
ECM 11	Install High Efficiency Furnaces	0	0.0	14.6	\$157.09	\$2,265.73	\$400.00	\$1,865.73	11.9	1,709
HVAC System Improvements		43,895	9.9	0.0	\$5,178.60	\$11,250.00	\$3,750.00	\$7,500.00	1.4	44,202
ECM 12	Install Dual Enthalpy Outside Economizer Control	43,895	9.9	0.0	\$5,178.60	\$11,250.00	\$3,750.00	\$7,500.00	1.4	44,202
Domestic Water Heating Upgrade		5,564	0.0	212.8	\$2,952.53	\$1,226.07	\$0.00	\$1,226.07	0.4	30,519
ECM 13	Install Low-Flow Domestic Hot Water Devices	5,564	0.0	212.8	\$2,952.53	\$1,226.07	\$0.00	\$1,226.07	0.4	30,519
Food Service Equipment & Refrigeration Measures		0	0.0	603.6	\$6,401.40	\$45,074.06	\$2,750.00	\$42,324.06	6.6	70,674
ECM 14	Food Service Equipment Replacement	0	0.0	603.6	\$6,401.40	\$45,074.06	\$2,750.00	\$42,324.06	6.6	70,674
Plug Load Equipment Control - Vending Machine		26,132	0.0	0.0	\$3,115.50	\$3,910.00	\$0.00	\$3,910.00	1.3	26,315
ECM 15	Vending Machine Control	26,132	0.0	0.0	\$3,115.50	\$3,910.00	\$0.00	\$3,910.00	1.3	26,315
TOTALS		1,292,372	378.3	831.0	\$162,820.60	\$1,112,746.26	\$124,888.00	\$987,858.26	6.1	1,398,709

* - 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).

Summary of Benchmarking – All Buildings



Building Name	Energy Star Score	Energy Use Intensity (kBtu/ft ²)	Energy Use Intensity (kBtu/ft ²)
Montville Township High School	59	Site EUI: 89.8 Source EUI: 176.3	Site EUI: 97.2 Source EUI: 190.9
Robert R. Lazar Middle School	63	Site EUI: 82.1 Source EUI: 137.8	Site EUI: 92.9 Source EUI: 156.1
Cedar Hill Elementary School	81	Site EUI: 66.7 Source EUI: 112	Site EUI: 91 Source EUI: 152.9
Hilldale Elementary School	80	Site EUI: 50.7 Source EUI: 117.6	Site EUI: 68 Source EUI: 157.6
Valley View Elementary School	63	Site EUI: 67 Source EUI: 125.5	Site EUI: 74.8 Source EUI: 140.2
William Mason School	62	Site EUI: 73.3 Source EUI: 122.8	Site EUI: 81.2 Source EUI: 136.1
Woodmont School	57	Site EUI: 65.4 Source EUI: 117.4	Site EUI: 70 Source EUI: 125.7
Board of Education Office	Additional data required	Site EUI: Source EUI:	Site EUI: Source EUI:



Some 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

PROGRAM PORTFOLIO



ELIGIBLE SECTORS

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

PROGRAMS

Equipment Rebates:

- Retrofit – Existing Buildings
- New Construction
- Direct Install – Small Business
- Large Energy Users

Whole Buildings:

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

Energy Generation:

- Combined Heat and Power (CHP) and Fuel Cells

Recommended NJCEP Incentives



➤ Direct Install

Donnelly Energy

Karan Raina

917-975-7191

kraina@donnellyenergy.com

➤ Pay for Performance (P4P)

➤ SmartStart Buildings (i.e Retrofit – Existing Buildings)

— we are —

A L L T O G E T H E R



NJNG Commercial and Government Programs

2017

- Launched in September 2009
- Encompasses energy-efficiency rebates and incentives available for our customers
- Promotes energy-efficiency and conservation measures to support state policy, and benefit our customers and the environment
- Designed to complement New Jersey's Clean Energy Program (NJCEP)



BPU Direct Install Program with NJ Natural Gas Savegreen Loan Program

- Direct Install is a simple, expeditious alternative that covers many types of improvements and offers a grant for 70 percent of the total cost of energy improvements up to \$178,570 per project
 - A “project” is considered a single or collection of ECM’s within a single building
- NJ Natural Gas Company’s SAVEGREEN program can provide the 30 percent balance with an up-front zero (0) percent loan paid back over 36 months using On Bill Repayment

Financing for Smart Start

- Certain Smart Start eligible equipment can be financed up to \$130,000 per project
- Project is first reviewed for DI eligibility
- NJNG can provide financing for the portion of Smart Start eligible equipment not covered by the BPU Smart Start grant at 0% interest, paid back over 10 years



Quick Review - Commercial Programs

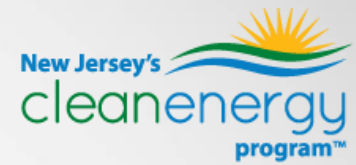
- Direct Install –
 - NJCEP provides 70% incentive
 - NJNG provides 0% financing to cover the balance
 - 3 year term- Repayments made on **regular monthly gas bill**
 - Maximum loan is \$53, 570
 - Combination means \$178,570 is available per project
- Smart Start
 - NJCEP provides rebates for qualifying equipment (varies by measure)
 - Including equipment identified in Direct Install assessment that may not be part of that program
 - NJNG provides 0% financing to help cover the balance
 - 10 year term- repayments made on regular monthly gas bill
 - Maximum loan amount is \$130,000
 - Need to review project with NJNG to confirm project qualifies
- SAVEGREEN can help with a consultation to discuss your Commercial Energy Efficiency Project



Contact Information

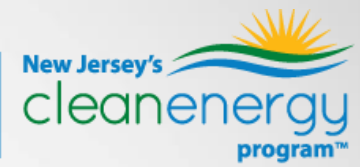
- Jerry Ryan
Energy Efficiency Operations Manager
New Jersey Natural Gas
732-433-4362 cell
732 378 4920 office
jryan@njng.com

Energy Savings Improvement Program (ESIP)

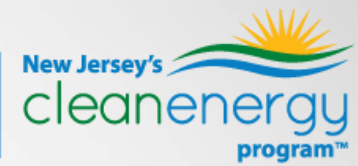


- Program administered directly by BPU
- Provides alternative financing for energy savings projects at public institutions.
- Value of energy savings leveraged to pay for cost of EE projects over a 15 year contract.
- Does not count as debt or require voter approval.
- Requires an audit as 1st step (LGEA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

Questions



?



FOR MORE INFORMATION

Visit NJCleanEnergy.com

Call (866) NJSMART

Jim Friedl

Outreach Manager

732-855-6543

jfriedl@trcsolutions.com