



# LGEA Presentation Roxbury Township Public Schools

August 22, 2023

### New Jersey's Clean Energy Program

Lighting the way to New Jersey's Clean Energy Future

## INTRODUCTIONS

- Roxbury Township Public Schools
  - Joseph Mondanaro Business Administrator
  - Kathy Kolbusch Assistant Business Administrator
  - Peter Riffel Director of Facilities
- NJ Clean Energy Program
  - Sarah Walters LGEA Project Manager
  - Moussa Traore LGEA Technical Manager
  - Thierry Nicolas LGEA Project Auditor
  - Meredith Coley LGEA Account Manager
  - Michelle Rossi ESIP Coordinator (BPU)

- Utility Energy Efficiency Programs
  - Mike Mandzik New Jersey Natural Gas
  - Sirajuddin Shaikh JCP&L
  - Kelly Rucko-Scaduto JCP&L
  - Tiffany Lewis JCP&L



## Agenda

- The audit process overview
- Energy use & existing conditions
- Review of Energy Conservation Measures (ECMs) identified & other recommendations
- Energy Savings Improvement Program (ESIP)
- Energy Efficiency Incentive Programs
- Questions regarding the draft audit report
- Next steps for Roxbury Township Public Schools



# LGEA PROCESS



- Application Approval
- Initial Call
- **Facility Interviews**
- Audit
- Benchmarking & Analysis
- **Draft Reports**
- LGEA Presentation
- Final Reports

# SITE VISIT & UTILITY ANALYSIS

# Overview of Systems, Baseline & Existing Conditions:

- Lighting System
- HVAC and Mechanical Systems
- Plug Load Equipment
- Cooking & Refrigeration Equipment

### **Utility Consumption:**

- Electric Consumption and Costs
- Natural Gas Consumption and Costs

### **Sites Visited/Analyzed**

- Board Office Admin Building
- Eisenhower Middle School
- Roxbury High School
- Transportation Building
- Franklin Elementary School
- Jefferson Elementary School
- Kennedy Elementary School
- Lincoln Roosevelt Elementary School
- Nixon Elementary School
- Special Services Admin Building



## UTILITY BREAKOUT

#### Percent of Total Annual Energy Costs



#### Pre & Post Implementation Cost



## Benchmarking



Site Name	ENERGY STAR <sup>®</sup> Score
Board Office Admin Building	63
Roxbury HS, Eisenhower MS, Maintenance Office & Transportation Building	33
Franklin Elementary School	14
Jefferson Elementary School	49
Kennedy Elementary School	11
Lincoln Roosevelt Elementary School	58
Nixon Elementary School	46
Special Services Admin Building	47



ENERGY STAR<sup>®</sup> scores are percentile ranking from 1 (least efficient) to 100 (most efficient). It compares your building's energy performance to similar buildings nationwide.

99.6

180.2

-13%

### Benchmarking



# 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 M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO2e Emissions Reduction (Ibs)
Lighting	Upgrades	24,907	4.2	-5.2	\$2,573	\$8,079	\$1,619	\$6,460	2.5	24,471
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	112	0.0	0.0	\$13	\$69	\$10	\$59	4.7	110
ECM 2	Retrofit Fixtures with LED Lamps	24,794	4.2	-5.2	\$2,560	\$8,011	\$1,609	\$6,402	2.5	24,361
Lighting	Control Measures	336,290	52.8	-70.3	\$33,758	\$189,231	\$44,975	\$144,256	4.3	330,409
ECM 3	Install Occupancy Sensor Lighting Controls	312,631	49.3	-65.4	\$31,440	\$171,476	\$30,460	\$141,016	4.5	307,163
ECM 4	Install High/Low Lighting Controls	23,660	3.4	-4.9	\$2 <i>,</i> 318	\$17,755	\$14,515	\$3,240	1.4	23,246
Variable	e Frequency Drive (VFD) Measures	619,653	128.5	10.4	\$63,721	\$546,991	\$54,700	\$492,291	7.7	625,207
ECM 5	Install VFDs on Constant Volume (CV) Fans	569,101	122.2	0.0	\$58,383	\$481,433	\$47 <i>,</i> 675	\$433,758	7.4	573,080
ECM 6	Install VFDs on Heating Water Pumps	46,655	6.3	0.0	\$4,779	\$61,671	\$6,950	\$54,721	11.5	46,981
ECM 7	Install VFDs on Kitchen Hood Fan Motors	3,897	0.0	10.4	\$559	\$3,887	\$75	\$3,812	6.8	5,145
Unitary	HVAC Measures	104,255	87.5	113.0	\$12,391	\$1,571,281	\$85,515	\$1,485,766	119.9	118,214
ECM 8	Install High Efficiency Air Conditioning Units	101,626	86.1	113.0	\$12,126	\$1,562,534	\$85 <i>,</i> 015	\$1,477,518	121.8	115,567
ECM 9	Install High Efficiency Heat Pumps	2,629	1.4	0.0	\$265	\$8,747	\$500	\$8,247	31.1	2,647
Gas Hea	ting (HVAC/Process) Replacement	0	0.0	248.6	\$3,543	\$36,350	\$1,800	\$34,550	9.8	29,109
ECM 10	Install High Efficiency Hot Water Boilers	0	0.0	36.8	\$456	\$10,342	\$400	\$9,942	21.8	4,304
ECM 11	Install High Efficiency Furnaces	0	0.0	41.4	\$573	\$3,503	\$500	\$3,003	5.2	4,847
ECM 12	Install High Efficiency Unit Heaters	0	0.0	3.3	\$44	\$7,710	\$0	\$7,710	175.8	391
ECM 13	Install Infrared Heaters	0	0.0	167.1	\$2 <i>,</i> 470	\$14,795	\$900	\$13,895	5.6	19,568

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# ALL OPPORTUNITIES

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO2e Emissions Reduction (Ibs)
HVAC Sy	ystem Improvements	18,542	0.0	115.5	\$3,583	\$49,222	\$266	\$48,956	13.7	32,199
ECM 14	Implement Demand Control Ventilation (DCV)	6,094	0.0	112.4	\$2,245	\$47,580	\$0	\$47,580	21.2	19,293
ECM 15	Install Pipe Insulation	12,448	0.0	3.2	\$1,339	\$1,642	\$266	\$1,376	1.0	12,906
Domest	ic Water Heating Upgrade	52,589	0.0	69.5	\$6,395	\$1,943	\$934	\$1,010	0.2	61,094
ECM 16	Install Low-Flow DHW Devices	52,589	0.0	69.5	\$6,395	\$1,943	\$934	\$1,010	0.2	61,094
Food Se	rvice & Refrigeration Measures	37,113	2.5	0.0	\$3,822	\$29,906	\$2 <i>,</i> 350	\$27,556	7.2	37,373
ECM 17	Refrigerator/Freezer Case Electrically Commutated Motors	6,295	0.8	0.0	\$652	\$7,583	\$1,000	\$6 <i>,</i> 583	10.1	6,339
ECM 18	Refrigeration Controls	18,286	0.3	0.0	\$1,905	\$19,333	\$1,000	\$18,333	9.6	18,414
ECM 19	Vending Machine Control	12,532	1.4	0.0	\$1,265	\$2,990	\$350	\$2,640	2.1	12,620
Custom	Measures	263,570	0.0	723.4	\$37,594	\$144,684	\$0	\$144,684	3.8	350,113
ECM 20	Retro-Commissioning Study	80,630	0.0	723.4	\$18,569	\$118,635	\$0	\$118,635	6.4	165,894
ECM 21	Replace Electric Water Heater with Heat Pump Water Heater	182,940	0.0	0.0	\$19,025	\$26,049	\$0	\$26,049	1.4	184,219
	TOTALS	1,456,920	275.5	1,204.9	\$167,381	\$2,577,687	\$192,159	\$2,385,529	14.3	1,608,189

\* - All incentives presented in this table are included as placesholders and are based on previously run state rebate programs. Contact your utility provider for details on current programs

## 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 M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (Ibs)
Lighting	Upgrades	24,907	4.2	-5.2	\$2,573	\$8,079	\$1,619	\$6,460	2.5	24,471
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	112	0.0	0.0	\$13	\$69	\$10	\$59	4.7	110
ECM 2	Retrofit Fixtures with LED Lamps	24,794	4.2	-5.2	\$2,560	\$8,011	\$1,609	\$6,402	2.5	24,361
Lighting	Control Measures	335,786	52.5	-70.2	\$33,690	\$187,725	\$44,750	\$142,975	4.2	329,914
ECM 3	Install Occupancy Sensor Lighting Controls	312,127	49.1	-65.3	\$31,372	\$169,970	\$30,235	\$139,735	4.5	306,668
ECM 4	Install High/Low Lighting Controls	23,660	3.4	-4.9	\$2,318	\$17,755	\$14,515	\$3,240	1.4	23,246
Variable	e Frequency Drive (VFD) Measures	614,237	127.1	10.4	\$63,139	\$531,613	\$54,350	\$477,263	7.6	619,753
ECM 5	Install VFDs on Constant Volume (CV) Fans	564,863	121.0	0.0	\$57,934	\$473,070	\$47,475	\$425,595	7.3	568,812
ECM 6	Install VFDs on Heating Water Pumps	45,477	6.1	0.0	\$4,646	\$54,656	\$6,800	\$47,856	10.3	45,795
ECM 7	Install VFDs on Kitchen Hood Fan Motors	3,897	0.0	10.4	\$559	\$3,887	\$75	\$3,812	6.8	5,145
Gas Hea	ting (HVAC/Process) Replacement	0	0.0	208.5	\$3,044	\$18,298	\$1,400	\$16,898	5.6	24,415
ECM 11	Install High Efficiency Furnaces	0	0.0	41.4	\$573	\$3,503	\$500	\$3,003	5.2	4,847
ECM 13	Install Infrared Heaters	0	0.0	167.1	\$2,470	\$14,795	\$900	\$13,895	5.6	19,568
HVAC S	ystem Improvements	13,763	0.0	46.0	\$2,104	\$12,518	\$266	\$12,252	5.8	19,240
ECM 14	Implement Demand Control Ventilation (DCV)	1,315	0.0	42.8	\$765	\$10,875	\$0	\$10,875	14.2	6,334
ECM 15	Install Pipe Insulation	12,448	0.0	3.2	\$1,339	\$1,642	\$266	\$1,376	1.0	12,906
Domest	ic Water Heating Upgrade	52,589	0.0	69.5	\$6,395	\$1,943	\$934	\$1,010	0.2	61,094
ECM 16	Install Low-Flow DHW Devices	52,589	0.0	69.5	\$6 <i>,</i> 395	\$1,943	\$934	\$1,010	0.2	61,094
Food Se	rvice & Refrigeration Measures	36,387	2.5	0.0	\$3,744	\$28,232	\$2,275	\$25,957	6.9	36,641
ECM 17	Refrigerator/Freezer Case Electrically Commutated Motors	6,295	0.8	0.0	\$652	\$7,583	\$1,000	\$6,583	10.1	6,339
ECM 18	Refrigeration Controls	17,560	0.2	0.0	\$1,827	\$17,659	\$925	\$16,734	9.2	17,682
ECM 19	Vending Machine Control	12,532	1.4	0.0	\$1,265	\$2,990	\$350	\$2,640	2.1	12,620
Custom	Measures	262,810	0.0	723.4	\$37,490	\$142,614	\$0	\$142,614	3.8	349,347
ECM 20	Retro-Commissioning Study	80,630	0.0	723.4	\$18,569	\$118,635	\$0	\$118,635	6.4	165,894
ECM 21	Replace Electric Water Heater with Heat Pump Water Heater	182,180	0.0	0.0	\$18,921	\$23,979	\$0	\$23,979	1.3	183,454
	TOTALS	1,340,480	186.4	982.4	\$152,178	\$931,022	\$105,594	\$825,428	5.4	1,464,875

\* - All incentives presented in this table are included as placesholders and are based on previously run state rebate programs. Contact your utility provider for details on current programs

## **BOARD OFFICE ADMIN BUILDING**

*	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO <sub>z</sub> e Emissions Reduction (lbs)
Lighting	Control Measures		5,760	1.2	-1	\$595	\$4,810	\$955	\$3,855	6.5	5,659
ECM 1	Install Occupancy Sensor Lighting Controls	Yes	5,760	1.2	-1	\$595	\$4,810	\$955	\$3,855	6.5	5,659
Motor l	Jpgrades		0	0.0	0	\$0	\$1,340	\$0	\$1,340	0.0	0
ECM 2	Premium Efficiency Motors	Yes	0	0.0	0	\$0	\$1,340	\$0	\$1,340	0.0	0
Variable	e Frequency Drive (VFD) Measures		4,238	1.1	0	\$449	\$7,023	\$200	\$6,823	15.2	4,268
ECM 3	Install VFDs on Constant Volume (CV) Fans	No	4,238	1.1	0	\$449	\$7,023	\$200	\$6,823	15.2	4,268
Unitary	HVAC Measures		3,990	1.6	0	\$422	\$19,887	\$1,050	\$18,837	44.6	4,018
ECM 4	Install High Efficiency Air Conditioning Units	No	3,990	1.6	0	\$422	\$19,887	\$1,050	\$18,837	44.6	4,018
Gas Hea	nting (HVAC/Process) Replacement		0	0.0	37	\$456	\$10,342	\$400	\$9,942	21.8	4,304
ECM 5	Install High Efficiency Hot Water Boilers	No	0	0.0	37	\$456	\$10,342	\$400	\$9,942	21.8	4,304
HVAC S	ystem Improvements		1,759	0.0	0	\$186	\$266	\$40	\$226	1.2	1,771
ECM 6	Install Pipe Insulation	Yes	1,759	0.0	0	\$186	\$266	\$40	\$226	1.2	1,771
Domest	ic Water Heating Upgrade		687	0.0	0	\$73	\$43	\$12	\$31	0.4	692
ECM 7	Install Low-Flow DHW Devices	Yes	687	0.0	0	\$73	\$43	\$12	\$31	0.4	692
	TOTALS (COST EFFECTIVE MEASURES)		8,206	1.2	-1	\$854	\$6,459	\$1,007	\$5,452	6.4	8,122
	TOTALS (ALL MEASURES)		16,434	3.9	36	\$2,181	\$43,711	\$2,657	\$41,054	18.8	20,712

\* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

## ROXBURY HIGH SCHOOL

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (Ibs)
Lighting	Upgrades		4,239	0.6	-1	\$415	\$1,051	\$258	\$793	1.9	4,165
ECM1	Retrofit Fixtures with LED Lamps	Yes	4,239	0.6	-1	\$415	\$1,051	\$258	\$793	1.9	4,165
Lighting	Control Measures		258,449	37.5	-54	\$25,292	\$124,681	\$28,200	\$96,481	3.8	253,929
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	234,965	34.1	-49	\$22,994	\$107,376	\$13,965	\$93,411	4.1	230,855
ECM 3	Install High/Low Lighting Controls	Yes	23,484	3.4	-5	\$2,298	\$17,305	\$14,235	\$3,070	1.3	23,073
Variable	Frequency Drive (VFD) Measures		501,609	98.3	0	\$50,639	\$413,372	\$43,050	\$370,322	7.3	505,116
ECM4	Install VFDs on Constant Volume (CV) Fans	Yes	463,545	94.4	0	\$46,796	\$372,109	\$38,450	\$333,659	7.1	466,787
ECM 5	Install VFDs on Heating Water Pumps	Yes	38,063	3.9	0	\$3,843	\$41,263	\$4,600	\$36,663	9.5	38,329
Unitary	HVAC Measures		78,137	64.3	81	\$9,084	\$1,176,461	\$67,080	\$1,109,381	122.1	88,154
ECM 6	Install High Efficiency Air Conditioning Units	No	75,509	62.9	81	\$8,818	\$1,167,714	\$66,580	\$1,101,134	124.9	85,507
ECM 7	Install High Efficiency Heat Pumps	No	2,629	1.4	0	\$265	\$8,747	\$500	\$8,247	31.1	2,647
Gas Hea	ting (HVAC/Process) Replacement		0	0.0	167	\$2,470	\$14,795	\$900	\$13,895	5.6	19,568
ECM 8	Install Infrared Heaters	Yes	0	0.0	167	\$2,470	\$14,795	\$900	\$13,895	5.6	19,568
HVAC S	ystem Improvements		9,756	0.0	43	\$1,617	\$11,834	\$156	\$11,678	7.2	14,834
ECM 9	Implement Demand Control Ventilation (DCV)	Yes	1,315	0.0	43	\$765	\$10,875	\$0	\$10,875	14.2	6,334
ECM 10	Install Pipe Insulation	Yes	8,441	0.0	0	\$852	\$958	\$156	\$802	0.9	8,500
Domest	ic Water Heating Upgrade		39,873	0.0	12	\$4,199	\$1,040	\$506	\$534	0.1	41,525
ECM 11	Install Low-Flow DHW Devices	Yes	39,873	0.0	12	\$4,199	\$1,040	\$506	\$534	0.1	41,525
Food Se	rvice & Refrigeration Measures		28,312	2.2	0	\$2,858	\$18,072	\$1,555	\$16,517	5.8	28,510
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	4,458	0.5	0	\$450	\$5,156	\$680	\$4,476	9.9	4,489
ECM 13	Refrigeration Controls	Yes	11,322	0.2	0	\$1,143	\$9,926	\$525	\$9,401	8.2	11,402
ECM 14	Vending Machine Control	Yes	12,532	1.4	0	\$1,265	\$2,990	\$350	\$2,640	2.1	12,620
Custom	Measures		188,120	0.0	404	\$24,957	\$102,004	\$0	\$102,004	4.1	236,695
ECM 15	Retro-Commissioning Study	Yes	65,025	0.0	404	\$12,531	\$91,409	\$0	\$91,409	7.3	112,739
ECM 16	Replace Electric Water Heater with Heat Pump Water Heater	Yes	123,095	0.0	0	\$12,426	\$10,595	\$O	\$10,595	0.9	123,956
	TOTALS (COST EFFECTIVE MEASURES)		1,030,358	138.6	570	\$112,447	\$686,848	\$74,625	\$612,224	5.4	1,104,340
	TOTALS (ALL MEASURES)		1,108,495	202.9	651	\$121,531	\$1,863,309	\$141,705	\$1,721,605	14.2	1,192,494

\* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

## FRANKLIN ELEMENTARY SCHOOL

•	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (S)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (Ibs)
Lighting	Upgrades		116	0.0	0	\$12	\$121	\$16	\$105	8.6	114
ECM 1	Retrofit Fixtures with LED Lamps	Yes	116	0.0	0	\$12	\$121	\$16	\$105	8.6	114
Lighting	Control Measures		7,966	1.4	-2	\$841	\$5,550	\$735	\$4,815	5.7	7,826
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	7,966	1.4	-2	\$841	\$5,550	\$735	\$4,815	5.7	7,826
Variable	e Frequency Drive (VFD) Measures		65,587	15.2	10	\$7,242	\$51,673	\$6,875	\$44,798	6.2	67,267
ECM 3	Install VFDs on Constant Volume (CV) Fans	Yes	54,276	13.0	0	\$5,880	\$34,393	\$4,600	\$29,793	5.1	54,656
ECM 4	Install VFDs on Heating Water Pumps	Yes	7,414	2.2	0	\$803	\$13,393	\$2,200	\$11,193	13.9	7,466
ECM 5	Install VFDs on Kitchen Hood Fan Motors	Yes	3,897	0.0	10	\$559	\$3,887	\$75	\$3,812	6.8	5,145
Unitary	HVAC Measures		11,114	8.5	o	\$1,204	\$173,960	\$8,280	\$165,680	137.6	11,192
ECM 6	Install High Efficiency Air Conditioning Units	No	11,114	8.5	0	\$1,204	\$173,960	\$8,280	\$165,680	137.6	11,192
Gas Hea	ating (HVAC/Process) Replacement		0	0.0	3	\$44	\$7,710	\$0	\$7,710	175.7	391
ECM 7	Install High Efficiency Unit Heaters	No	0	0.0	3	\$44	\$7,710	\$0	\$7,710	175.7	391
HVAC S	ystem Improvements		3,620	0.0	17	\$610	\$14,954	\$0	\$14,954	24.5	5,584
ECM 8	Implement Demand Control Ventilation (DCV)	No	3,620	0.0	17	\$610	\$14,954	\$0	\$14,954	24.5	5,584
Domest	ic Water Heating Upgrade		0	0.0	13	\$172	\$172	\$84	\$88	0.5	1,536
ECM 9	Install Low-Flow DHW Devices	Yes	0	0.0	13	\$172	\$172	\$84	\$88	0.5	1,536
Food Se	rvice & Refrigeration Measures		1,251	0.1	0	\$135	\$2,281	\$155	\$2,126	15.7	1,259
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	524	0.1	0	\$57	\$607	\$80	\$527	9.3	528
ECM 11	Refrigeration Controls	No	726	0.0	0	\$79	\$1,674	\$75	\$1,599	20.3	731
Custom	Measures		8,389	0.0	84	\$2,011	\$7,500	\$0	\$7,500	3.7	18,261
ECM 12	Retro-Commissioning Study	Yes	8,389	0.0	84	\$2,011	\$7,500	\$0	\$7,500	3.7	18,261
	TOTALS (COST EFFECTIVE MEASURES)		82,582	16.7	106	\$10,336	\$65,623	\$7,790	\$57,833	5.6	95,531
	TOTALS (ALL MEASURES)		98,042	25.3	126	\$12,272	\$263,921	\$16,145	\$247,776	20.2	113,429

\* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

## JEFFERSON ELEMENTARY SCHOOL

	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO <sub>z</sub> e Emissions Reduction (lbs)
Lighting	Upgrades		675	0.1	0	\$74	\$183	\$50	\$133	1.8	663
ECM 1	Retrofit Fixtures with LED Lamps	Yes	675	0.1	0	\$74	\$183	\$50	\$133	1.8	663
Lighting	Control Measures		7,327	1.3	-2	\$806	\$6,988	\$1,645	\$5,343	6.6	7,199
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	7,327	1.3	-2	\$806	\$6,988	\$1,645	\$5,343	6.6	7,199
HVAC S	stem Improvements		2,450	0.0	11	\$431	\$7,071	\$46	\$7,025	16.3	3,755
ECM 3	Implement Demand Control Ventilation (DCV)	No	329	0.0	10	\$177	\$6,797	\$0	\$6,797	38.4	1,499
ECM 4	Install Pipe Insulation	Yes	2,121	0.0	1	\$254	\$274	\$46	\$228	0.9	2,256
Domest	ic Water Heating Upgrade		2,985	0.0	5	\$408	\$172	\$75	\$97	0.2	3,594
ECM 5	Install Low-Flow DHW Devices	Yes	2,985	0.0	5	\$408	\$172	\$75	\$97	0.2	3,594
Custom	Measures		18,464	0.0	0	\$2,086	\$4,545	\$0	\$4,545	2.2	18,593
ECM 6	Replace Electric Water Heater with Heat Pump Water Heater	Yes	18,464	0.0	0	\$2,086	\$4,545	\$0	\$4,545	2.2	18,593
	TOTALS (COST EFFECTIVE MEASURES)		31,572	1.4	4	\$3,628	\$12,162	\$1,816	\$10,346	2.9	32,305
	TOTALS (ALL MEASURES)		31,900	1.4	14	\$3,805	\$18,959	\$1,816	\$17,143	4.5	33,804

\* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

## KENNEDY ELEMENTARY SCHOOL

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO2e Emissions Reduction (lbs)
Lighting	Upgrades		18,343	3.2	-4	\$1,900	\$4,394	\$1,007	\$3,387	1.8	18,023
ECM 1	Retrofit Fixtures with LED Lamps	Yes	18,343	3.2	-4	\$1,900	\$4,394	\$1,007	\$3,387	1.8	18,023
Lighting	Control Measures		11,778	1.8	-2	\$1,220	\$8,196	\$2,040	\$6,156	5.0	11,572
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	11,778	1.8	-2	\$1,220	\$8,196	\$2,040	\$6,156	5.0	11,572
Variable	Frequency Drive (VFD) Measures		14,859	3.3	0	\$1,583	\$17,142	\$1,250	\$15,892	10.0	14,963
ECM 3	Install VFDs on Constant Volume (CV) Fans	Yes	14,859	3.3	0	\$1,583	\$17,142	\$1,250	\$15,892	10.0	14,963
Unitary	HVAC Measures		3,520	1.8	16	\$606	\$65,671	\$3,323	\$62,349	102.9	5,464
ECM 4	Install High Efficiency Air Conditioning Units	No	3,520	1.8	16	\$606	\$65,671	\$3,323	\$62,349	102.9	5,464
Domest	c Water Heating Upgrade		3,614	0.0	O	\$385	\$93	\$47	\$47	0.1	3,640
ECM 5	Install Low-Flow DHW Devices	Yes	3,614	0.0	0	\$385	\$93	\$47	\$47	0.1	3,640
Food Se	rvice & Refrigeration Measures		3,865	0.1	0	\$412	\$4,473	\$280	\$4,193	10.2	3,892
ECM 6	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	527	0.1	0	\$56	\$607	\$80	\$527	9.4	531
ECM 7	Refrigeration Controls	Yes	3,338	0.0	0	\$356	\$3,867	\$200	\$3,667	10.3	3,362
Custom	Measures		28,312	0.0	0	\$3,016	\$5,516	\$0	\$5,516	1.8	28,510
ECM 8	Replace Electric Water Heater with Heat Pump Water Heater	Yes	28,312	0.0	0	\$3,016	\$5,516	\$0	\$5,516	1.8	28,510
	TOTALS (COST EFFECTIVE MEASURES)		80,772	8.4	-6	\$8,515	\$39,814	\$4,624	\$35,190	4.1	80,600
	TOTALS (ALL MEASURES)		84,293	10.1	10	\$9,121	\$105,485	\$7,946	\$97,539	10.7	86,064

\* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

## LINCOLN ROOSEVELT ELEMENTARY SCHOOL

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO2e Emissions Reduction (Ibs)
Lighting	Upgrades		1,534	0.3	0	\$172	\$2,332	\$288	\$2,044	11.9	1,507
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	112	0.0	0	\$13	\$69	\$10	\$59	4.7	110
ECM 2	Retrofit Fixtures with LED Lamps	Yes	1,422	0.3	0	\$159	\$2,263	\$278	\$1,985	12.5	1,397
Lighting	Control Measures		17,760	4.7	-4	\$1,988	\$15,836	\$6,650	\$9,186	4.6	17,449
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	17,760	4.7	-4	\$1,988	\$15,836	\$6,650	\$9,186	4.6	17,449
Variable	e Frequency Drive (VFD) Measures		21,437	7.1	0	\$2,460	\$35,117	\$1,975	\$33,142	13.5	21,587
ECM 4	Install VFDs on Constant Volume (CV) Fans	Yes	21,437	7.1	0	\$2,460	\$35,117	\$1,975	\$33,142	13.5	21,587
Unitary	HVAC Measures		6,431	9.9	9	\$856	\$104,057	\$4,598	\$99,459	116.2	7,495
ECM 5	Install High Efficiency Air Conditioning Units	No	6,431	9.9	9	\$856	\$104,057	\$4,598	\$99,459	116.2	7,495
HVAC S	ystem Improvements		303	0.0	19	\$289	\$5,485	\$8	\$5,477	18.9	2,504
ECM 6	Implement Demand Control Ventilation (DCV)	No	303	0.0	17	\$260	\$5,438	\$0	\$5,438	20.9	2,253
ECM 7	Install Pipe Insulation	Yes	0	0.0	2	\$29	\$48	\$8	\$40	1.4	251
Domest	ic Water Heating Upgrade		o	0.0	40	\$537	\$258	\$127	\$131	0.2	4,640
ECM 8	Install Low-Flow DHW Devices	Yes	0	0.0	40	\$537	\$258	\$127	\$131	0.2	4,640
Custom	Measures		7,216	0.0	236	\$4,027	\$19,726	\$0	\$19,726	4.9	34,894
ECM 9	Retro-Commissioning Study	Yes	7,216	0.0	236	\$4,027	\$19,726	\$0	\$19,726	4.9	34,894
	TOTALS (COST EFFECTIVE MEASURES)		47,947	12.1	274	\$9,212	\$73,317	\$9,048	\$64,268	7.0	80,328
	TOTALS (ALL MEASURES)		54,680	21.9	299	\$10,329	\$182,811	\$13,646	\$169,165	16.4	90,075

\* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

## NIXON ELEMENTARY SCHOOL

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO2e Emissions Reduction (Ibs)
Lighting	Control Measures		26,748	4.6	-6	\$2,948	\$21,664	\$4,525	\$17,139	5.8	26,280
ECM 1	Install Occupancy Sensor Lighting Controls	Yes	26,572	4.6	-6	\$2,929	\$21,214	\$4,245	\$16,969	5.8	26,108
ECM 2	Install High/Low Lighting Controls	Yes	175	0.0	0	\$19	\$450	\$280	\$170	8.8	172
Variable	Frequency Drive (VFD) Measures		11,923	3.5	0	\$1,349	\$21,323	\$1,350	\$19,973	14.8	12,006
ECM 3	Install VFDs on Constant Volume (CV) Fans	Yes	10,745	3.3	0	\$1,216	\$14,308	\$1,200	\$13,108	10.8	10,820
ECM 4	Install VFDs on Heating Water Pumps	No	1,178	0.2	0	\$133	\$7,015	\$150	\$6,865	51.5	1,186
Unitary	HVAC Measures		1,062	1.4	7	\$219	\$31,245	\$1,185	\$30,060	137.0	1,892
ECM 5	Install High Efficiency Air Conditioning Units	No	1,062	1.4	7	\$219	\$31,245	\$1,185	\$30,060	137.0	1,892
HVAC Sy	stem Improvements		529	0.0	26	\$432	\$9,516	\$0	\$9,516	22.0	3,623
ECM 6	Implement Demand Control Ventilation (DCV)	No	529	0.0	26	\$432	\$9,516	\$0	\$9,516	22.0	3,623
Domesti	c Water Heating Upgrade		5,152	0.0	0	\$583	\$151	\$75	\$75	0.1	5,188
ECM 7	Install Low-Flow DHW Devices	Yes	5,152	0.0	0	\$583	\$151	\$75	\$75	0.1	5,188
Food Se	rvice & Refrigeration Measures		3,685	0.1	0	\$417	\$5,080	\$360	\$4,720	11.3	3,711
ECM 8	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	786	0.1	0	\$89	\$1,213	\$160	\$1,053	11.8	792
ECM 9	Refrigeration Controls	Yes	2,899	0.0	0	\$328	\$3,867	\$200	\$3,667	11.2	2,919
Custom	Measures		12,309	0.0	0	\$1,393	\$3,323	\$0	\$3,323	2.4	12,395
ECM 10	Replace Electric Water Heater with Heat Pump Water Heater	Yes	12,309	0.0	0	\$1,393	\$3,323	\$0	\$3,323	2.4	12,395
	TOTALS (COST EFFECTIVE MEASURES)		58,639	8.1	-6	\$6,558	\$44,526	\$6,160	\$38,365	5.9	58,394
	TOTALS (ALL MEASURES)		61,407	9.6	28	\$7,343	\$92,302	\$7,495	\$84,806	11.5	65,096

\* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

## SPECIAL SERVICES ADMIN BUILDING

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (Ibs)
Lighting	Control Measures		504	0.2	0	\$68	\$1,506	\$225	\$1,281	18.9	495
ECM 1	Install Occupancy Sensor Lighting Controls	No	504	0.2	0	\$68	\$1,506	\$225	\$1,281	18.9	495
Gas Hea	ting (HVAC/Process) Replacement		0	0.0	41	\$573	\$3,503	\$500	\$3,003	5.2	4,847
ECM 2	Install High Efficiency Furnaces	Yes	0	0.0	41	\$573	\$3,503	\$500	\$3,003	5.2	4,847
HVAC S	ystem Improvements		127	0.0	0	\$17	\$95	\$16	\$79	4.6	127
ECM 3	Install Pipe Insulation	Yes	127	0.0	0	\$17	\$95	\$16	\$79	4.6	127
Domest	ic Water Heating Upgrade		278	0.0	0	\$38	\$14	\$7	\$7	0.2	280
ECM 4	Install Low-Flow DHW Devices	Yes	278	0.0	0	\$38	\$14	\$7	\$7	0.2	280
Custom	Measures		760	0.0	0	\$104	\$2,070	\$0	\$2,070	19.9	765
ECM 5	Replace Electric Water Heater with Heat Pump Water Heater	No	760	0.0	0	\$104	\$2,070	\$0	\$2,070	19.9	765
	TOTALS (COST EFFECTIVE MEASURES)		405	0.0	41	\$629	\$3,613	\$523	\$3,090	4.9	5,255
	TOTALS (ALL MEASURES)		1,669	0.2	41	\$800	\$7,189	\$748	\$6,441	8.0	6,515

\* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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### 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



### MEASURES FOR FUTURE CONSIDERATION

• Upgrade to a Heat Pump System



### EV CHARGING STATION POTENTIAL

NJCleanEnergy.com/EV



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### SOLAR ENERGY GENERATION POTENTIAL

NJCleanEnergy.com/renewable-energy

	Roxbury HS	Franklin ES	Jefferson ES	Kennedy ES	Lincoln Roosevelt	Nixon ES
Potential:	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH
System Potential: (kW)	172	105	88	134	109	105
Electric Generation: (kWh per year)	204,915	125,094	104,841	159,644	129,859	125,094
Displaced Cost: (per year)	\$20,690	\$13,550	\$11,840	\$17,000	\$14,900	\$14,160



### FINANCING MECHANISM: ESIP

NJCleanEnergy.com/ESIP

### **ENERGY SAVINGS IMPROVEMENT PROGRAM (ESIP)**

- Energy Performance Contracting = NJ ESIP Program
- A creative tool and financing mechanism that allows public entities to make energy efficiency improvements without impacting their budgets
- Administered by the NJBPU
- Project is paid for with the value of its own energy savings
- 2 Options: Lease Purchase Loan or Bond
- 15 or 20 year pay back term
- NJBPU Approved Incentive Programs
  - Utility or NJCEP
- Can be combined with Federal/State Grants
- No upfront capital expenses
- No referendum or impact to tax payers



### ENERGY SAVINGS IMPROVEMENT PROGRAM

NJCleanEnergy.com/ESIP





### ENERGY SAVINGS IMPROVEMENT PROGRAM

NJCleanEnergy.com/ESIP

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### **C&I** ENERGY EFFICIENCY PROGRAMS

#### NJCleanEnergy.com



### UTILITY RUN ENERGY EFFICIENCY PROGRAMS\*

#### NJCleanEnergy.com/Transition

#### **PRESCRIPTIVE & CUSTOM REBATES:**

#### **DIRECT INSTALL:**

#### **ENERGY MANAGEMENT :**

- Individual high efficiency equipment rebates for renovation, remodeling, and equipment replacement
- Flexibility to do a little or a lot
- No size requirement
- Turn-key retrofit program to replace outdated and inefficient equipment including, lighting, HVAC, refrigeration, etc.
- The facility must have an average electric peak demand <200kW in the previous year to qualify
- Includes the Building Tune-up (BT), Retro-commissioning (RCx), and Strategic Energy Management (SEM) subprograms. These subprograms offer a comprehensive mix of custom energy-savings measures such as basic HVAC tune-ups, building systems tune-ups, controls' calibration, diagnostic testing, and installation of measures to enhance your building's energy performance and savings.

#### **ENGINEERED SOLUTIONS:**

- · Comprehensive, whole-building approach to saving energy
- The facility must have an average electric peak demand >200kW in the previous year to qualify

\*Other programs may be available to you. Check with your Utility Provider to see a full list of offering and what you may be qualified for.

### UTILITY RUN ENERGY EFFICIENCY PROGRAMS

### JCP&L

### **New Jersey Natural Gas**

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