New Jersey's Clean Energy Program

LGEA Presentation Montclair Kimberley Academy

October 20, 2020





INTRODUCTIONS

- Montclair Kimberley Academy
 - Kathryn Davison CFO
 - Ben Rich Sustainability Coordinator
 - Charles Janus Assistant Business Manager/Controller MS
 - Laura Zimmerman Middle School Science
- NJ Clean Energy Program
 - Aimee Lalonde TRC Program Manager
 - Sarah Walters TRC Account Manager
 - Mike Mandzik TRC Outreach Manager



Agenda

- The audit process overview
- Energy use & existing conditions
- Review of Energy Conservation Measures (ECMs) identified
- Questions regarding the draft audit report
- Overview of NJCEP equipment incentives
- Next steps for Montclair Kimberley Academy



LGEA PROCESS

Application Approval

Scheduling Call

Audit

Benchmarking & Analysis

Draft Report

LGEA Presentation

Final Report



SITE VISIT & UTILITY ANALYSIS

Overview of Systems, Baseline & Existing Conditions:

- Lighting System
- HVAC and Mechanical Systems
- Plug Load Equipment

Utility Consumption:

- Electric Consumption and Costs
- Natural Gas Consumption and Costs

Sites Visited/Analyzed

- MKA Primary School
- MKA Middle School
- MKA Upper School



UTILITY BREAKOUT

Percent of Total Annual Energy Costs



program[®]

Pre & Post Implementation Cost



Benchmarking



Professional Engineer or Registered Architect Stamp (If applicable)

Benchmarking



| Site Name | STAR [®] Score |
|--------------------|----------------------------|
| MKA Primary School | 43 |
| MKA Upper School | 40 |
| MKA Middle School | 61 |



ALL OPPORTUNITIES

Savings Potential





- Lighting Upgrades
- Lighting Control Measures
- Motor Upgrades
- Variable Frequency Drive (VFD) Measures
- Electric Unitary HVAC Measures
- Gas Heating (HVAC/Process) Replacement
- HVAC System Improvements
- Domestic Water Heating Upgrade
- Food Service & Refrigeration Measures
- Custom Measures

ALL OPPORTUNITIES

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings (\$) | Estimated Install Cost (\$) | Estimated Incentive (\$)* | Estimated Net Cost (\$) | Simple Payback Period (yrs)** | CO₂e Emissions Reduction (Ibs) |
|------------|--|--|-----------------------------------|--------------------------------------|---|-----------------------------------|---------------------------------|-------------------------------|--|---|
| Lighting | Upgrades | 242,921 | 78.6 | -45.0 | \$34,405 | \$103,830 | \$22,604 | \$81,226 | 2.4 | 239,350 |
| ECM 1 | Install LED Fixtures | 22,611 | 0.0 | 0.0 | \$3,158 | \$15,830 | \$4,400 | \$11,430 | 3.6 | 22,769 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | 42,955 | 10.1 | -9.0 | \$5 <i>,</i> 982 | \$16,714 | \$2,429 | \$14,285 | 2.4 | 42,204 |
| ECM 3 | Retrofit Fixtures with LED Lamps | 177,355 | 68.5 | -36.0 | \$25,265 | \$71,286 | \$15,775 | \$55,511 | 2.2 | 174,377 |
| Lighting | Control Measures | 83,272 | 19.3 | -17.4 | \$11,894 | \$98,939 | \$21,405 | \$77,534 | 6.5 | 81,815 |
| ECM 4 | Install Occupancy Sensor Lighting Controls | 68,216 | 15.8 | -14.3 | \$9,737 | \$69,364 | \$8 <i>,</i> 595 | \$60,769 | 6.2 | 67,023 |
| ECM 5 | Install Daylight Dimming/Photocell Controls | 0 | 0.0 | 0.0 | \$0 | \$6,400 | \$0 | \$6,400 | 0.0 | 0 |
| ECM 6 | Install High/Low Lighting Controls | 15,056 | 3.5 | -3.1 | \$2,157 | \$23,175 | \$12,810 | \$10,365 | 4.8 | 14,792 |
| Motor U | pgrades | 4,108 | 0.9 | 0.0 | \$575 | \$13,090 | \$0 | \$13,090 | 22.8 | 4,137 |
| ECM 7 | Premium Efficiency Motors | 4,108 | 0.9 | 0.0 | \$575 | \$13,090 | \$0 | \$13,090 | 22.8 | 4,137 |
| Variable | Frequency Drive (VFD) Measures | 76,503 | 21.3 | 31.2 | \$11,329 | \$138,418 | \$8 <i>,</i> 875 | \$129,543 | 11.4 | 80,691 |
| ECM 8 | Install VFDs on Constant Volume (CV) Fans | 59,621 | 19.9 | 0.0 | \$8,793 | \$96,781 | \$6,775 | \$90,006 | 10.2 | 60,038 |
| ECM 9 | Install VFDs on Heating Water Pumps | 15,517 | 1.4 | 0.0 | \$2,079 | \$38,376 | \$2,000 | \$36,376 | 17.5 | 15,626 |
| ECM 10 | Install VFDs on Kitchen Hood Fan Motors | 1,364 | 0.0 | 31.2 | \$456 | \$3,261 | \$100 | \$3,161 | 6.9 | 5,028 |
| Electric l | Jnitary HVAC Measures | 25,087 | 26.9 | 0.0 | \$3,574 | \$235,113 | \$12,233 | \$222,880 | 62.4 | 25,263 |
| ECM 11 | Install High Efficiency Air Conditioning Units | 25,087 | 26.9 | 0.0 | \$3,574 | \$235,113 | \$12,233 | \$222,880 | 62.4 | 25,263 |



ALL OPPORTUNITIES

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings (\$) | Estimated Install Cost (\$) | Estimated Incentive (\$)* | Estimated Net Cost (\$) | Simple Payback Period (yrs)** | CO ₂ e Emissions Reduction (Ibs) |
|----------|--|--|-----------------------------------|--------------------------------------|---|-----------------------------------|---------------------------------|-------------------------------|--|--|
| Gas Heat | ting (HVAC/Process) Replacement | 0 | 0.0 | 830.1 | \$7,355 | \$263,880 | \$9,828 | \$254,052 | 34.5 | 97,196 |
| ECM 12 | Install High Efficiency Hot Water Boilers | 0 | 0.0 | 727.5 | \$6,474 | \$232,364 | \$7,428 | \$224,936 | 34.7 | 85,181 |
| ECM 13 | Install High Efficiency Furnaces | 0 | 0.0 | 102.6 | \$882 | \$31,516 | \$2,400 | \$29,116 | 33.0 | 12,015 |
| HVAC Sy | stem Improvements | 2,174 | 0.0 | 76.4 | \$986 | \$8,612 | \$136 | \$8,476 | 8.6 | 11,133 |
| ECM 14 | Implement Demand Control Ventilation (DCV) | 1,856 | 0.0 | 44.3 | \$655 | \$8,157 | \$0 | \$8,157 | 12.5 | 7,056 |
| ECM 15 | Install Pipe Insulation | 318 | 0.0 | 32.1 | \$331 | \$455 | \$136 | \$319 | 1.0 | 4,077 |
| Domesti | c Water Heating Upgrade | 18,860 | 16.2 | -23.4 | \$2,751 | \$36,858 | \$999 | \$35,859 | 13.0 | 16,246 |
| ECM 16 | Install High Efficiency Gas-Fired Water Heater | 18,860 | 16.2 | -64.3 | \$2,398 | \$35,600 | \$645 | \$34,955 | 14.6 | 11,457 |
| ECM 17 | Install Low-Flow DHW Devices | 0 | 0.0 | 40.9 | \$353 | \$1,259 | \$354 | \$905 | 2.6 | 4,789 |
| Food Sei | rvice & Refrigeration Measures | 13,701 | 1.2 | 0.0 | \$1,895 | \$16,907 | \$1,240 | \$15,667 | 8.3 | 13,797 |
| ECM 18 | Refrigerator/Freezer Case Electrically Commutated Motors | 1,441 | 0.2 | 0.0 | \$216 | \$1,820 | \$240 | \$1,580 | 7.3 | 1,451 |
| ECM 19 | Refrigeration Controls | 4,214 | 0.1 | 0.0 | \$601 | \$7,733 | \$400 | \$7,333 | 12.2 | 4,244 |
| ECM 20 | Replace Refrigeration Equipment | 8,046 | 0.9 | 0.0 | \$1,078 | \$7,354 | \$600 | \$6,754 | 6.3 | 8,102 |
| Custom | Measures | 364 | 0.5 | 16.5 | \$193 | \$2,704 | \$0 | \$2,704 | 14.0 | 2,299 |
| ECM 21 | Install Duct Insulation | 364 | 0.5 | 16.5 | \$193 | \$2,704 | \$0 | \$2,704 | 14.0 | 2,299 |
| | TOTALS | 466,990 | 164.8 | 868.3 | \$74,958 | \$918,351 | \$77,320 | \$841,031 | 11.2 | 571,927 |

* - 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).



COST EFFECTIVE OPPORTUNITIES

Savings Potential





COST EFFECTIVE OPPORTUNITIES

| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings (\$) | Estimated Install Cost (\$) | Estimated Incentive (\$)* | Estimated Net Cost (\$) | Simple Payback Period (yrs)** | CO2e Emissions Reduction (Ibs) |
|----------|--|--|-----------------------------------|--------------------------------------|---|-----------------------------------|---------------------------------|-------------------------------|--|---|
| Lighting | Upgrades | 242,921 | 78.6 | -45.0 | \$34,405 | \$103,830 | \$22,604 | \$81,226 | 2.4 | 239,350 |
| ECM 1 | Install LED Fixtures | 22,611 | 0.0 | 0.0 | \$3,158 | \$15,830 | \$4,400 | \$11,430 | 3.6 | 22,769 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | 42,955 | 10.1 | -9.0 | \$5,982 | \$16,714 | \$2,429 | \$14,285 | 2.4 | 42,204 |
| ECM 3 | Retrofit Fixtures with LED Lamps | 177,355 | 68.5 | -36.0 | \$25,265 | \$71,286 | \$15,775 | \$55,511 | 2.2 | 174,377 |
| Lighting | Control Measures | 83,272 | 19.3 | -17.4 | \$11,894 | \$98,939 | \$21,405 | \$77,534 | 6.5 | 81,815 |
| ECM 4 | Install Occupancy Sensor Lighting Controls | 68,216 | 15.8 | -14.3 | \$9,737 | \$69,364 | \$8,595 | \$60,769 | 6.2 | 67,023 |
| ECM 6 | Install High/Low Lighting Controls | 15,056 | 3.5 | -3.1 | \$2,157 | \$23,175 | \$12,810 | \$10,365 | 4.8 | 14,792 |
| Motor U | pgrades | 0 | 0.0 | 0.0 | \$0 | \$0 | \$0 | \$0 | 0.0 | 0 |
| ECM 7 | Premium Efficiency Motors | 0 | 0.0 | 0.0 | \$0 | \$0 | \$0 | \$0 | 0.0 | 0 |
| Variable | Frequency Drive (VFD) Measures | 33,414 | 11.2 | 31.2 | \$5,462 | \$35,967 | \$4,525 | \$31,442 | 5.8 | 37,302 |
| ECM 8 | Install VFDs on Constant Volume (CV) Fans | 32,050 | 11.2 | 0.0 | \$5,005 | \$32,706 | \$4,425 | \$28,281 | 5.7 | 32,274 |
| ECM 10 | Install VFDs on Kitchen Hood Fan Motors | 1,364 | 0.0 | 31.2 | \$456 | \$3,261 | \$100 | \$3,161 | 6.9 | 5,028 |
| HVAC Sy | stem Improvements | 318 | 0.0 | 32.1 | \$331 | \$455 | \$136 | \$319 | 1.0 | 4,077 |
| ECM 15 | Install Pipe Insulation | 318 | 0.0 | 32.1 | \$331 | \$455 | \$136 | \$319 | 1.0 | 4,077 |
| Domest | c Water Heating Upgrade | 0 | 0.0 | 40.9 | \$353 | \$1,259 | \$354 | \$905 | 2.6 | 4,789 |
| ECM 17 | Install Low-Flow DHW Devices | 0 | 0.0 | 40.9 | \$353 | \$1,259 | \$354 | \$905 | 2.6 | 4,789 |
| Food Se | rvice & Refrigeration Measures | 9,487 | 1.1 | 0.0 | \$1,295 | \$9,174 | \$840 | \$8,334 | 6.4 | 9,554 |
| ECM 18 | Refrigerator/Freezer Case Electrically Commutated Motors | 1,441 | 0.2 | 0.0 | \$216 | \$1,820 | \$240 | \$1,580 | 7.3 | 1,451 |
| ECM 20 | Replace Refrigeration Equipment | 8,046 | 0.9 | 0.0 | \$1,078 | \$7,354 | \$600 | \$6,754 | 6.3 | 8,102 |
| Custom | Measures | 364 | 0.5 | 16.5 | \$193 | \$2,704 | \$0 | \$2,704 | 14.0 | 2,299 |
| ECM 21 | Install Duct Insulation | 364 | 0.5 | 16.5 | \$193 | \$2,704 | \$0 | \$2,704 | 14.0 | 2,299 |
| | TOTALS | 369,777 | 110.7 | 58.3 | \$53,933 | \$252,327 | \$49,864 | \$202,463 | 3.8 | 379,186 |

* - 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).

MKA PRIMARY SCHOOL

| # | Energy Conservation Measure | Cost Effective? | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings (\$) | Estimated Install Cost (\$) | Estimated Incentive (\$)* | Estimated Net Cost (\$) | Simple Payback Period (yrs)** | CO2e Emissions Reduction (Ibs) |
|----------|--|--------------------|--|-----------------------------------|--------------------------------------|---|-----------------------------------|---------------------------------|-------------------------------|--|---|
| Lighting | Upgrades | | 36,152 | 8.7 | -7 | \$5,306 | \$15,249 | \$3,679 | \$11,570 | 2.2 | 35,602 |
| ECM 1 | Install LED Fixtures | Yes | 2,739 | 0.0 | 0 | \$407 | \$1,365 | \$500 | \$865 | 2.1 | 2,758 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | Yes | 11,733 | 3.3 | -2 | \$1,720 | \$4,797 | \$770 | \$4,027 | 2.3 | 11,528 |
| ECM 3 | Retrofit Fixtures with LED Lamps | Yes | 21,679 | 5.4 | -4 | \$3,179 | \$9,087 | \$2,409 | \$6,678 | 2.1 | 21,315 |
| Lighting | Control Measures | | 13,336 | 3.4 | -3 | \$1,955 | \$15,435 | \$2,940 | \$12,495 | 6.4 | 13,103 |
| ECM 4 | Install Occupancy Sensor Lighting Controls | Yes | 12,116 | 3.1 | -3 | \$1,776 | \$13,410 | \$1,715 | \$11,695 | 6.6 | 11,904 |
| ECM 5 | Install High/Low Lighting Controls | Yes | 1,220 | 0.3 | 0 | \$179 | \$2,025 | \$1,225 | \$800 | 4.5 | 1,199 |
| Motor L | Jpgrades | | 805 | 0.2 | 0 | \$120 | \$2,242 | \$0 | \$2,242 | 18.7 | 811 |
| ECM 6 | Premium Efficiency Motors | No | 805 | 0.2 | 0 | \$120 | \$2,242 | \$0 | \$2,242 | 18.7 | 811 |
| Variable | Frequency Drive (VFD) Measures | | 6,394 | 2.1 | 0 | \$950 | \$14,265 | \$450 | \$13,815 | 14.5 | 6,438 |
| ECM 7 | Install VFDs on Constant Volume (CV) Fans | No | 6,394 | 2.1 | 0 | \$950 | \$14,265 | \$450 | \$13,815 | 14.5 | 6,438 |
| Electric | Unitary HVAC Measures | | 1,125 | 1.9 | 0 | \$167 | \$18,152 | \$736 | \$17,416 | 104.2 | 1,133 |
| ECM 8 | Install High Efficiency Air Conditioning Units | No | 1,125 | 1.9 | 0 | \$167 | \$18,152 | \$736 | \$17,416 | 104.2 | 1,133 |
| Gas Hea | ting (HVAC/Process) Replacement | | 0 | 0.0 | 186 | \$1,739 | \$84,394 | \$7,640 | \$76,754 | 44.1 | 21,831 |
| ECM 9 | Install High Efficiency Hot Water Boilers | No | 0 | 0.0 | 184 | \$1,717 | \$81,403 | \$6,840 | \$74,563 | 43.4 | 21,546 |
| ECM 10 | Install High Efficiency Furnaces | No | 0 | 0.0 | 2 | \$23 | \$2,991 | \$800 | \$2,191 | 96.5 | 285 |
| HVAC Sy | stem Improvements | | 0 | 0.0 | 4 | \$39 | \$45 | \$14 | \$31 | 0.8 | 492 |
| ECM 11 | Install Pipe Insulation | Yes | 0 | 0.0 | 4 | \$39 | \$45 | \$14 | \$31 | 0.8 | 492 |
| Domest | ic Water Heating Upgrade | | 0 | 0.0 | 4 | \$41 | \$194 | \$108 | \$86 | 2.1 | 510 |
| ECM 12 | Install Low-Flow DHW Devices | Yes | 0 | 0.0 | 4 | \$41 | \$194 | \$108 | \$86 | 2.1 | 510 |
| | TOTALS (COST EFFECTIVE MEASURES) | | 49,488 | 12.1 | -1 | \$7,341 | \$30,922 | \$6,741 | \$24,181 | 3.3 | 49,706 |
| | TOTALS (ALL MEASURES) | | 57,812 | 16.3 | 185 | \$10,316 | \$149,974 | \$15,567 | \$134,407 | 13.0 | 79,919 |

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

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

MKA MIDDLE SCHOOL

| # | Energy Conservation Measure | Cost Effective? | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings (\$) | Estimated Install Cost (\$) | Estimated Incentive (\$)* | Estimated Net Cost (\$) | Simple Payback Period (yrs)** | CO2e Emissions Reduction (Ibs) |
|----------|--|--------------------|--|-----------------------------------|--------------------------------------|---|-----------------------------------|---------------------------------|-------------------------------|--|---|
| Lighting | Upgrades | | 77,641 | 28.2 | -15 | \$12,001 | \$37,196 | \$8,456 | \$28,740 | 2.4 | 76,469 |
| ECM 1 | Install LED Fixtures | Yes | 3,968 | 0.0 | 0 | \$620 | \$1,500 | \$600 | \$900 | 1.5 | 3,996 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | Yes | 6,096 | 1.9 | -1 | \$941 | \$3,880 | \$482 | \$3,398 | 3.6 | 5,989 |
| ECM 3 | Retrofit Fixtures with LED Lamps | Yes | 67,577 | 26.3 | -13 | \$10,440 | \$31,816 | \$7,374 | \$24,442 | 2.3 | 66,484 |
| Lighting | Control Measures | | 31,319 | 8.7 | -7 | \$4,835 | \$51,720 | \$11,165 | \$40,555 | 8.4 | 30,772 |
| ECM 4 | Install Occupancy Sensor Lighting Controls | Yes | 24,590 | 6.9 | -5 | \$3,796 | \$35,970 | \$4,655 | \$31,315 | 8.2 | 24,160 |
| ECM 5 | Install Photocell Controls | Yes | 0 | 0.0 | 0 | \$0 | \$3,600 | \$0 | \$3,600 | 0.0 | 0 |
| ECM 6 | Install High/Low Lighting Controls | Yes | 6,730 | 1.9 | -1 | \$1,039 | \$12,150 | \$6,510 | \$5,640 | 5.4 | 6,612 |
| Motor L | Ipgrades | | 588 | 0.2 | 0 | \$92 | \$3,649 | \$0 | \$3,649 | 39.7 | 592 |
| ECM 7 | Premium Efficiency Motors | No | 588 | 0.2 | 0 | \$92 | \$3,649 | \$0 | \$3,649 | 39.7 | 592 |
| Variable | Frequency Drive (VFD) Measures | | 32,050 | 11.2 | 0 | \$5,005 | \$32,706 | \$4,425 | \$28,281 | 5.7 | 32,274 |
| ECM 8 | Install VFDs on Constant Volume (CV) Fans | Yes | 32,050 | 11.2 | 0 | \$5,005 | \$32,706 | \$4,425 | \$28,281 | 5.7 | 32,274 |
| Electric | Unitary HVAC Measures | | 8,826 | 13.9 | 0 | \$1,378 | \$105,756 | \$5,238 | \$100,518 | 72.9 | 8,888 |
| ECM 9 | Install High Efficiency Air Conditioning Units | No | 8,826 | 13.9 | 0 | \$1,378 | \$105,756 | \$5,238 | \$100,518 | 72.9 | 8,888 |
| Gas Hea | ting (HVAC/Process) Replacement | | 0 | 0.0 | 96 | \$817 | \$22,220 | \$1,388 | \$20,832 | 25.5 | 11,234 |
| ECM 10 | Install High Efficiency Hot Water Boilers | No | 0 | 0.0 | 20 | \$170 | \$7,538 | \$588 | \$6,950 | 40.9 | 2,336 |
| ECM 11 | Install High Efficiency Furnaces | No | 0 | 0.0 | 76 | \$647 | \$14,682 | \$800 | \$13,882 | 21.5 | 8,898 |
| HVAC Sy | stem Improvements | | 1,542 | 0.0 | 44 | \$612 | \$5,542 | \$28 | \$5,514 | 9.0 | 6,664 |
| ECM 12 | Implement Demand Control Ventilation (DCV) | No | 1,224 | 0.0 | 36 | \$495 | \$5,438 | \$0 | \$5,438 | 11.0 | 5,413 |
| ECM 13 | Install Pipe Insulation | Yes | 318 | 0.0 | 8 | \$117 | \$104 | \$28 | \$76 | 0.7 | 1,251 |
| Domest | ic Water Heating Upgrade | | 18,860 | 16.2 | -33 | \$2,664 | \$36,622 | \$867 | \$35,755 | 13.4 | 15,116 |
| ECM 14 | Install High Efficiency Gas-Fired Water Heater | No | 18,860 | 16.2 | -64 | \$2,398 | \$35,600 | \$645 | \$34,955 | 14.6 | 11,457 |
| ECM 15 | Install Low-Flow DHW Devices | Yes | 0 | 0.0 | 31 | \$266 | \$1,022 | \$222 | \$800 | 3.0 | 3,659 |
| Food Se | rvice & Refrigeration Measures | | 2,676 | 0.2 | 0 | \$418 | \$4,561 | \$310 | \$4,251 | 10.2 | 2,694 |
| ECM 16 | Refrigerator/Freezer Case Electrically Commutated Motors | Yes | 1,048 | 0.1 | 0 | \$164 | \$1,213 | \$160 | \$1,053 | 6.4 | 1,055 |
| ECM 17 | Refrigeration Controls | No | 1,628 | 0.0 | 0 | \$254 | \$3,348 | \$150 | \$3,198 | 12.6 | 1,639 |
| | TOTALS (COST EFFECTIVE MEASURES) | | 142,377 | 48.2 | 18 | \$22,388 | \$123,962 | \$24,456 | \$99,506 | 4.4 | 145,480 |
| | TOTALS (ALL MEASURES) | | | 78.5 | 85 | \$27,822 | \$299,972 | \$31,877 | \$268,095 | 9.6 | 184,702 |

MKA UPPER SCHOOL

| # | Energy Conservation Measure | Cost Effective? | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings (\$) | Estimated Install Cost (\$) | Estimated Incentive (\$)* | Estimated Net Cost (\$) | Simple Payback Period (yrs)** | CO2e Emissions Reduction (Ibs) |
|----------|--|--------------------|--|-----------------------------------|--------------------------------------|---|-----------------------------------|---------------------------------|-------------------------------|--|---|
| Lighting | Upgrades | | 129,129 | 41.7 | -24 | \$17,098 | \$51,385 | \$10,469 | \$40,916 | 2.4 | 127,279 |
| ECM 1 | Install LED Fixtures | Yes | 15,904 | 0.0 | 0 | \$2,131 | \$12,965 | \$3,300 | \$9,665 | 4.5 | 16,015 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | Yes | 25,126 | 4.9 | -5 | \$3,321 | \$8,036 | \$1,177 | \$6,859 | 2.1 | 24,687 |
| ECM 3 | Retrofit Fixtures with LED Lamps | Yes | 88,099 | 36.8 | -18 | \$11,646 | \$30,383 | \$5,992 | \$24,391 | 2.1 | 86,578 |
| Lighting | Control Measures | | 38,616 | 7.1 | -8 | \$5,104 | \$31,784 | \$7,300 | \$24,484 | 4.8 | 37,941 |
| ECM 4 | Install Occupancy Sensor Lighting Controls | Yes | 31,511 | 5.8 | -7 | \$4,165 | \$19,984 | \$2,225 | \$17,759 | 4.3 | 30,959 |
| ECM 5 | Install Photocell Controls | Yes | 0 | 0.0 | 0 | \$0 | \$2,800 | \$0 | \$2,800 | 0.0 | 0 |
| ECM 6 | Install High/Low Lighting Controls | Yes | 7,106 | 1.3 | -1 | \$939 | \$9,000 | \$5,075 | \$3,925 | 4.2 | 6,981 |
| Motor L | Ipgrades | | 2,715 | 0.5 | 0 | \$364 | \$7,199 | \$0 | \$7,199 | 19.8 | 2,734 |
| ECM 7 | Premium Efficiency Motors | No | 2,715 | 0.5 | 0 | \$364 | \$7,199 | \$0 | \$7,199 | 19.8 | 2,734 |
| Variable | Frequency Drive (VFD) Measures | | 38,059 | 8.1 | 31 | \$5,374 | \$91,447 | \$4,000 | \$87,447 | 16.3 | 41,979 |
| ECM 8 | Install VFDs on Constant Volume (CV) Fans | No | 21,177 | 6.6 | 0 | \$2,838 | \$49,811 | \$1,900 | \$47,911 | 16.9 | 21,325 |
| ECM 9 | Install VFDs on Heating Water Pumps | No | 15,517 | 1.4 | 0 | \$2,079 | \$38,376 | \$2,000 | \$36,376 | 17.5 | 15,626 |
| ECM 10 | Install VFDs on Kitchen Hood Fan Motors | Yes | 1,364 | 0.0 | 31 | \$456 | \$3,261 | \$100 | \$3,161 | 6.9 | 5,028 |
| Electric | Unitary HVAC Measures | | 15,136 | 11.1 | 0 | \$2,028 | \$111,205 | \$6,259 | \$104,946 | 51.7 | 15,242 |
| ECM 11 | Install High Efficiency Air Conditioning Units | No | 15,136 | 11.1 | 0 | \$2,028 | \$111,205 | \$6,259 | \$104,946 | 51.7 | 15,242 |
| Gas Hea | ting (HVAC/Process) Replacement | | 0 | 0.0 | 548 | \$4,799 | \$157,266 | \$800 | \$156,466 | 32.6 | 64,131 |
| ECM 12 | Install High Efficiency Hot Water Boilers | No | 0 | 0.0 | 524 | \$4,587 | \$143,423 | \$0 | \$143,423 | 31.3 | 61,299 |
| ECM 13 | Install High Efficiency Furnaces | No | 0 | 0.0 | 24 | \$212 | \$13,844 | \$800 | \$13,044 | 61.6 | 2,831 |
| HVAC S | stem Improvements | | 632 | 0.0 | 29 | \$335 | \$3,025 | \$94 | \$2,931 | 8.8 | 3,978 |
| ECM 14 | Implement Demand Control Ventilation (DCV) | No | 632 | 0.0 | 9 | \$160 | \$2,719 | \$0 | \$2,719 | 17.0 | 1,643 |
| ECM 15 | Install Pipe Insulation | Yes | 0 | 0.0 | 20 | \$175 | \$306 | \$94 | \$212 | 1.2 | 2,335 |
| Domest | ic Water Heating Upgrade | | 0 | 0.0 | 5 | \$46 | \$43 | \$24 | \$19 | 0.4 | 621 |
| ECM 16 | Install Low-Flow DHW Devices | Yes | 0 | 0.0 | 5 | \$46 | \$43 | \$24 | \$19 | 0.4 | 621 |
| Food Se | rvice & Refrigeration Measures | | 11,026 | 1.0 | 0 | \$1,478 | \$12,346 | \$930 | \$11,416 | 7.7 | 11,103 |
| ECM 17 | Refrigerator/Freezer Case Electrically Commutated Motors | Yes | 393 | 0.0 | 0 | \$53 | \$607 | \$80 | \$527 | 10.0 | 396 |
| ECM 18 | Refrigeration Controls | No | 2,587 | 0.0 | 0 | \$347 | \$4,385 | \$250 | \$4,135 | 11.9 | 2,605 |
| ECM 19 | Replace Refrigeration Equipment | Yes | 8,046 | 0.9 | 0 | \$1,078 | \$7,354 | \$600 | \$6,754 | 6.3 | 8,102 |
| Custom | Measures | | 364 | 0.5 | 17 | \$193 | \$2,704 | \$0 | \$2,704 | 14.0 | 2,299 |
| ECM 20 | Install Duct Insulation | Yes | 364 | 0.5 | 17 | \$193 | \$2,704 | \$0 | \$2,704 | 14.0 | 2,299 |
| | TOTALS (COST EFFECTIVE MEASURES) | | 177,912 | 50.4 | 41 | \$24,204 | \$97,443 | \$18,667 | \$78,776 | 3.3 | 184,000 |
| | TOTALS (ALL MEASURES) | | 235,677 | 70.0 | 598 | \$36,819 | \$468,404 | \$29,876 | \$438,528 | 11.9 | 307,306 |

16

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/Replace Energy
 Management System
- Install High Efficiency Energy Recovery Units (ERUs)
- Building Envelope Improvements
- Pool Heating System Upgrades



SOLAR ENERGY GENERATION POTENTIAL

| | Primary School | Middle School | Upper School |
|--|-------------------|------------------|-----------------|
| Potential: | HIGH | HIGH | HIGH |
| System Potential: (kW) | 67 | 180 | 210 |
| Electric Generation: (kWh per year) | 79,822 | 214,446 | 250,188 |
| Displaced Cost: (per year) | \$11,860 | \$33,490 | \$33,530 |

Transition Incentive (TI) Program:

https://www.njcleanenergy.com/renewableenergy/programs/transition-incentive-program



Community Solar Energy Pilot Program:

http://www.NJCleanEnergy.com/ CommunitySolar

CLEAN ENERGY PROGRAM PORTFOLIO

ELIGIBLE SECTORS

INCENTIVE PROGRAMS

OTHER PROGRAMS



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

Equipment Rebates:

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

Whole Buildings:

Pay for Performance

Energy Generation:

Combined Heat and Power – Fuel Cells

Renewable Energy Generation:

- Transition Incentive (TI) Program
- Community Solar

RECOMMENDED NJCEP INCENTIVES PER BUILDING

| Montclair Kimberley Academy | Pay For Performance | Direct Install | SmartStart | CTEEP |
|--------------------------------|------------------------|-------------------|------------|-------|
| MKA Primary School | Х | X | Х | Х |
| MKA Middle School | X | | X | X |
| MKA Upper School | X | | Х | X |

Buildings marked with a lighter X do not quite meet the requirements of the current P4P program. P4P should be evaluated again once project planning is underway.



PAY FOR PERFORMANCE

NJCleanEnergy.com/P4P

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



- Qualifications: Annual peak demand 200 kW+ in the previous year for existing buildings
- About:Customer choose from a network of pre-approved ParticipatingPartners

Incentives: Incentives paid in <u>three</u> installments

- Up to \$2MM per project
 - \$1 million for electric measures
 - \$1 million for gas measures
- Up to 50% of project cost
- \$4MM per entity annually



Pay for Performance

NJCleanEnergy.com/P4P





DIRECT INSTALL

NJCleanEnergy.com/DI

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



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

About:

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

Incentives:

- es: \$125,000 incentive funding per project/building, or
 - \$250,000 entity cap



DIRECT INSTALL

NJCleanEnergy.com/DI

INCENTIVE FUNDING

CUSTOMER

Up to <u>70%</u> of installed cost is paid directly to the contractor

30% of installed cost







Participating Contractor

Willdan Energy Solutions David Torres 1-732-662-4228 x6120 david.torres@willdan.com



SMARTSTART

NJCleanEnergy.com/SSB

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



Qualifications: • All C&I customer types contributing into the Societal Benefits Charge (SBC)

About:

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

Incentives:

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



SMARTSTART

NJCleanEnergy.com/SSB



PRESCRIPTIVE INCENTIVES

- Electric Chillers
- Gas Cooling
- Electric Unitary HVAC
- Ground Source Heat Pumps
- Gas Heating
- Variable Frequency Drives
- Gas Water Heating
- Lighting/Lighting Controls
- Refrigeration Doors
- Refrigeration Controls
- Food Service Equipment
- Refrigerator/Freezer Motors





- New or innovative technologies proven to be cost-effective and not listed as prescriptive
- Must meet code for retrofit projects or exceed code for new construction
- Project pre and post inspection required

CUSTOMER TAILORED ENERGY EFFICIENCY PILOT NJCleanEnergy.com/CTEEP

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

Qualifications: • All C&I customer types contributing into the Societal Benefits Charge (SBC)

About:

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

Incentives:

- Up to \$500,000 for each electric or gas account
- Technical assistance incentives for custom project evaluation (up to \$10K)

SAME INCENTIVE VALUES AS SMARTSTART



CTEEP: CUSTOMER TAILORED ENERGY EFFICIENCY PILOT

NJCleanEnergy.com/CTEEF

program^{**}



FOR MORE INFORMATION

NJ Clean Energy Program

Aimee Lalonde – LGEA Program Manager

ALalonde@trccompanies.com

(347) 913-2422

Amanda Muench – LGEA Account Manager

AMuench@trccompanies.com (732) 612-9381

Mike Mandzik – Outreach Account Manager MMandzik@trccompanies.com

(732) 570-7534



Sarah Walters – LGEA Account Manager

SWalters@trccompanies.com (732) 612-9381

Sarah Landis – LGEA Auditor

SLandis@trccompanies.com (732) 439-7184

> NJCleanEnergy.com (732) 855-0033

QUESTIONS



