

LGEA Presentation

Glen Rock Public Schools

August 23, 2022



New Jersey's
Clean Energy Program

Lighting the way to New Jersey's Clean Energy Future

INTRODUCTIONS

- *Glen Rock Public Schools*

- Mike Rinderknecht – Business Administrator
- Don Mutch – Buildings & Grounds Supervisor

- *NJ Clean Energy Program*

- Sarah Walters – LGEA Project Manager
- Moussa Traore – LGEA Lead Auditor
- Nick Nocco – LGEA Project Auditor
- Meredith Coley – LGEA Account Manager
- Michelle Rossi – ESIP Coordinator (BPU)

- *Utility Energy Efficiency Programs*

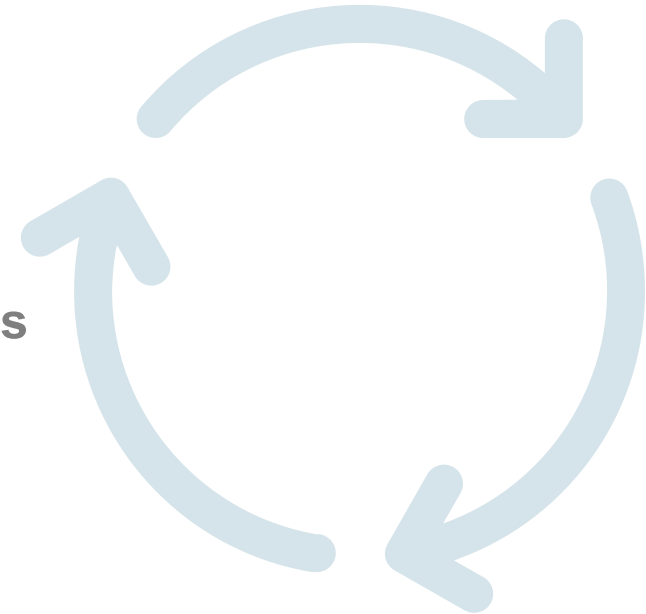
- Dave Kirsch – PSE&G
- Steve Barba – PSE&G

AGENDA

- The audit process overview
- Energy use & existing conditions
- Review of **E**nergy **C**onservation **M**easures (ECMs) identified & other recommendations
- Energy Savings Improvement Program (ESIP)
- Energy Efficiency Incentive Programs
- Questions regarding the draft audit report
- Next steps for Glen Rock 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 and Refrigeration Equipment

Utility Consumption:

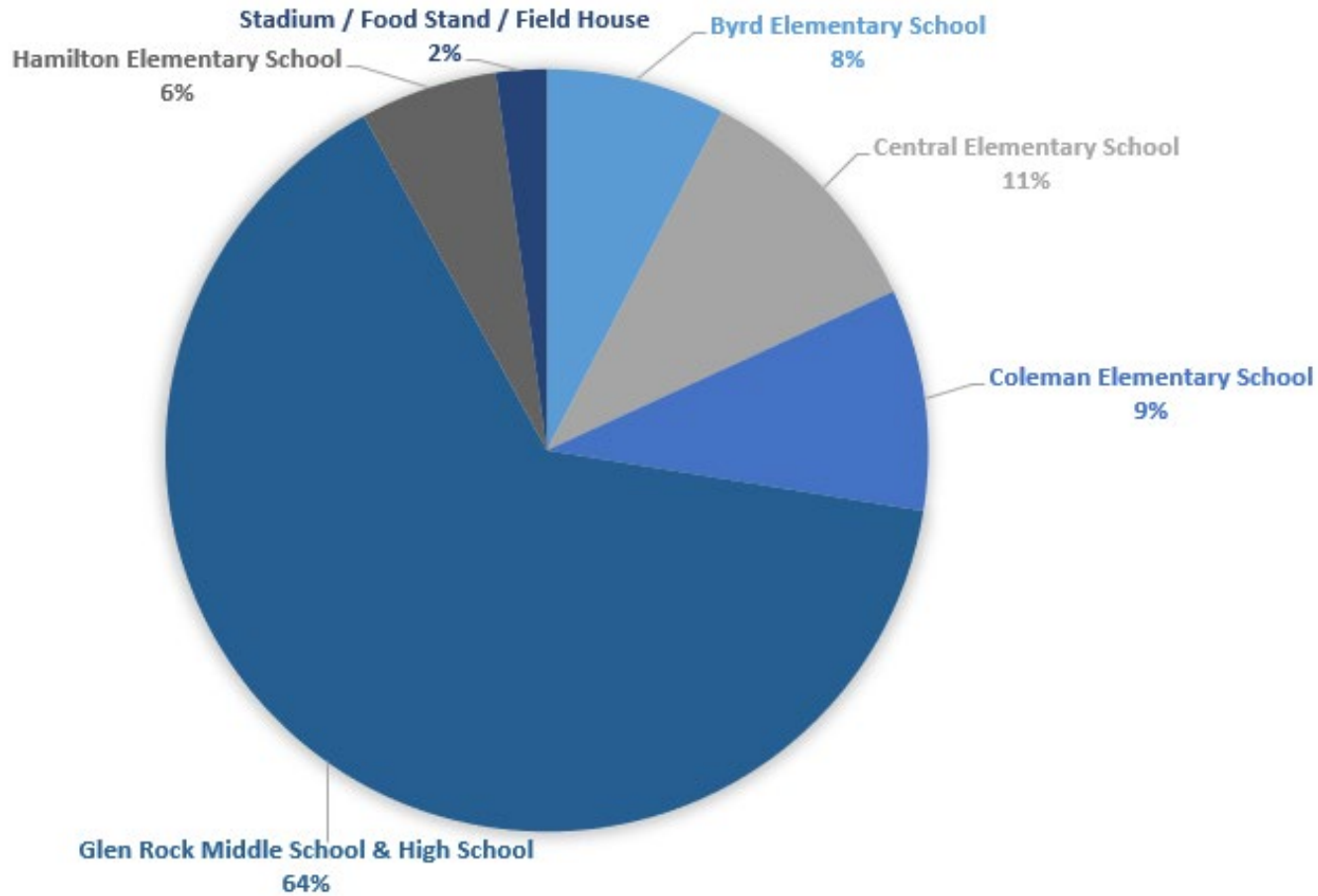
- Electric Consumption and Costs
- Natural Gas Consumption and Costs
- Solar Consumption and Costs

Sites Visited/Analyzed

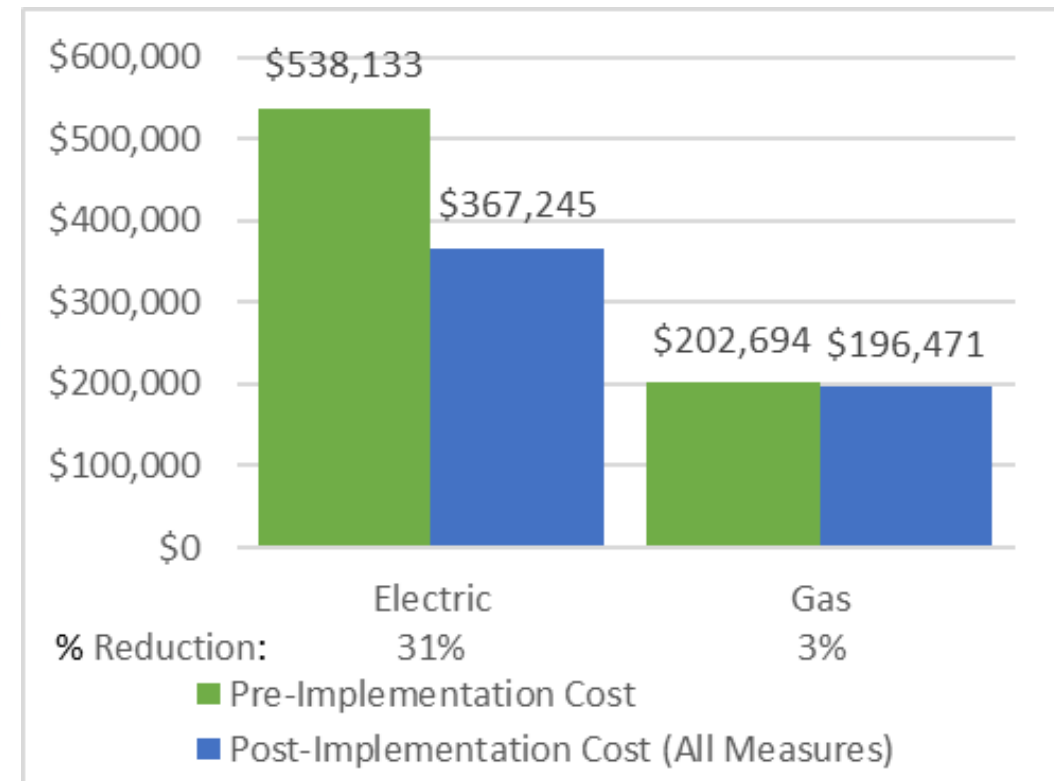
- Hamilton Elementary School
- Central Elementary School
- Coleman Elementary School
- Byrd Elementary School
- Glen Rock Middle/High School
- Glen Rock High School Food Stand
- Glen Rock High School Field House
- Glen Rock High School Stadium

UTILITY BREAKOUT


Percent of Total Annual Energy Costs



Pre & Post Implementation Cost



BENCHMARKING



ENERGY STAR® Statement of Energy Performance

41

ENERGY STAR® Score¹

Hamilton Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 29,845
Built: 1958

For Year Ending: November 30, 2021
Date Generated: July 08, 2022

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

| Property & Contact Information | | |
|---|---|--|
| Property Address Hamilton Elementary School 380 Harristown Road Glen Rock, New Jersey 07452 | Property Owner Glen Rock Public Schools 620 Harristown Road Glen Rock, NJ 07452 (201) 445-7700 | Primary Contact Michael Rinderknecht 620 Harristown Road Glen Rock, NJ 07452 (201) 445-7700 mrinder@glenrocknj.org |
| Property ID: 20583540 | | |

| Energy Consumption and Energy Use Intensity (EUI) | | | |
|---|--|--|-------|
| Site EUI 72.5 kBtu/ft² | Annual Energy by Fuel | National Median Comparison | |
| | Electric - Solar (kBtu) 80,092 (4%) | National Median Site EUI (kBtu/ft²) | 66.7 |
| | Natural Gas (kBtu) 1,314,777 (81%) | National Median Source EUI (kBtu/ft²) | 111.1 |
| | Electric - Grid (kBtu) 762,172 (35%) | % Diff from National Median Source EUI | 9% |
| Source EUI 120.6 kBtu/ft² | Annual Emissions | | |
| | Greenhouse Gas Emissions (Metric Tons CO2e/year) | | |

Site EUI
72.5 kBtu/ft²

Source EUI
120.6 kBtu/ft²

National Median Comparison

National Median Site EUI (kBtu/ft²) 66.7

National Median Source EUI (kBtu/ft²) 111.1

% Diff from National Median Source EUI 9%

Signature & Stamp of Verifying Professional

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

LP Signature: _____ Date: _____

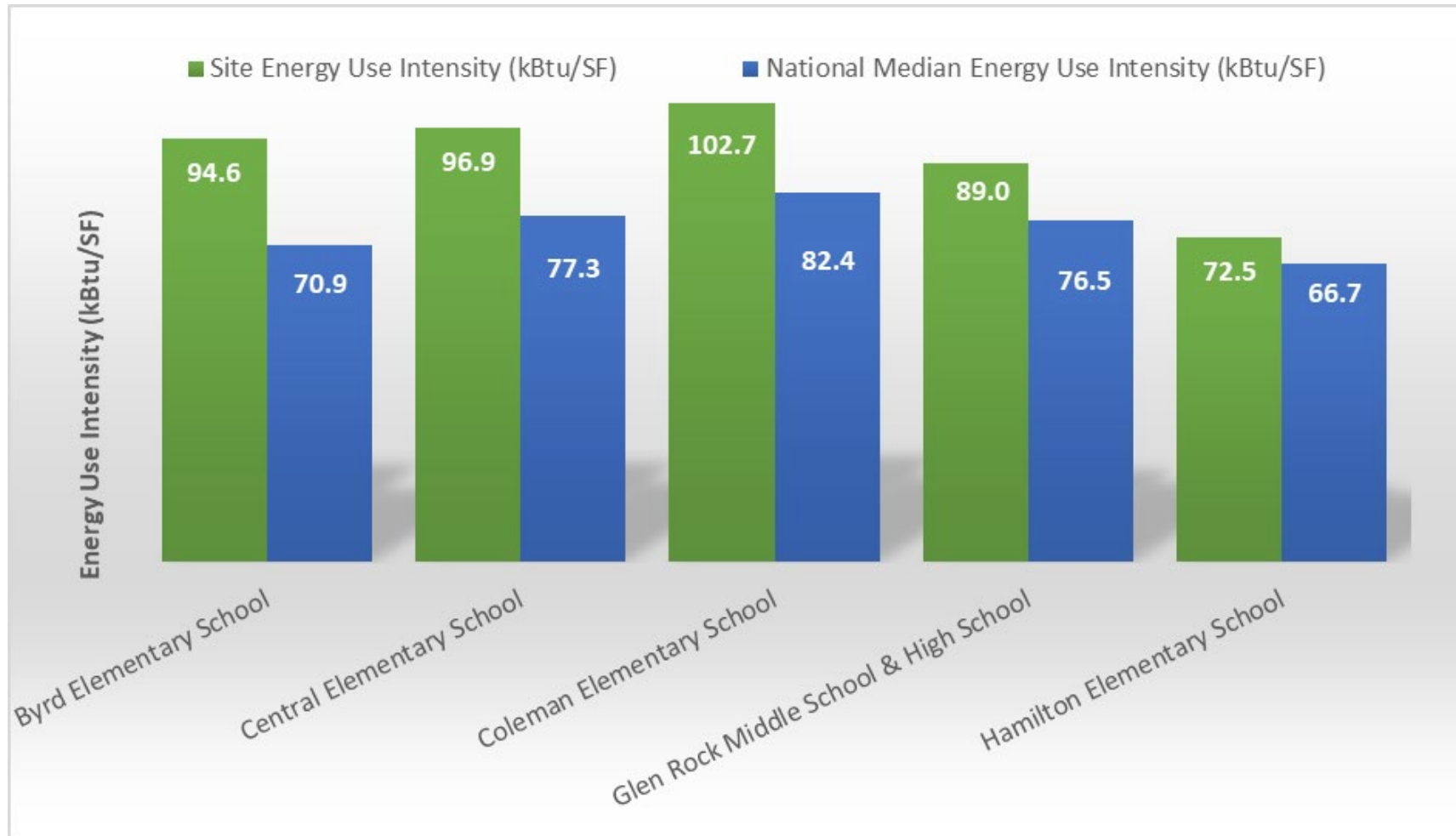
Licensed Professional

Professional Engineer or Registered Architect Stamp (if applicable)

| Site Name | ENERGY STAR® Score |
|-----------------------------------|--------------------|
| Hamilton Elementary School | 41 |
| Central Elementary School | 27 |
| Coleman Elementary School | 27 |
| Byrd Elementary School | 22 |
| Glen Rock Middle/High School | 34 |
| Glen Rock High School Food Stand | N/A |
| Glen Rock High School Field House | N/A |
| Glen Rock High School Stadium | N/A |

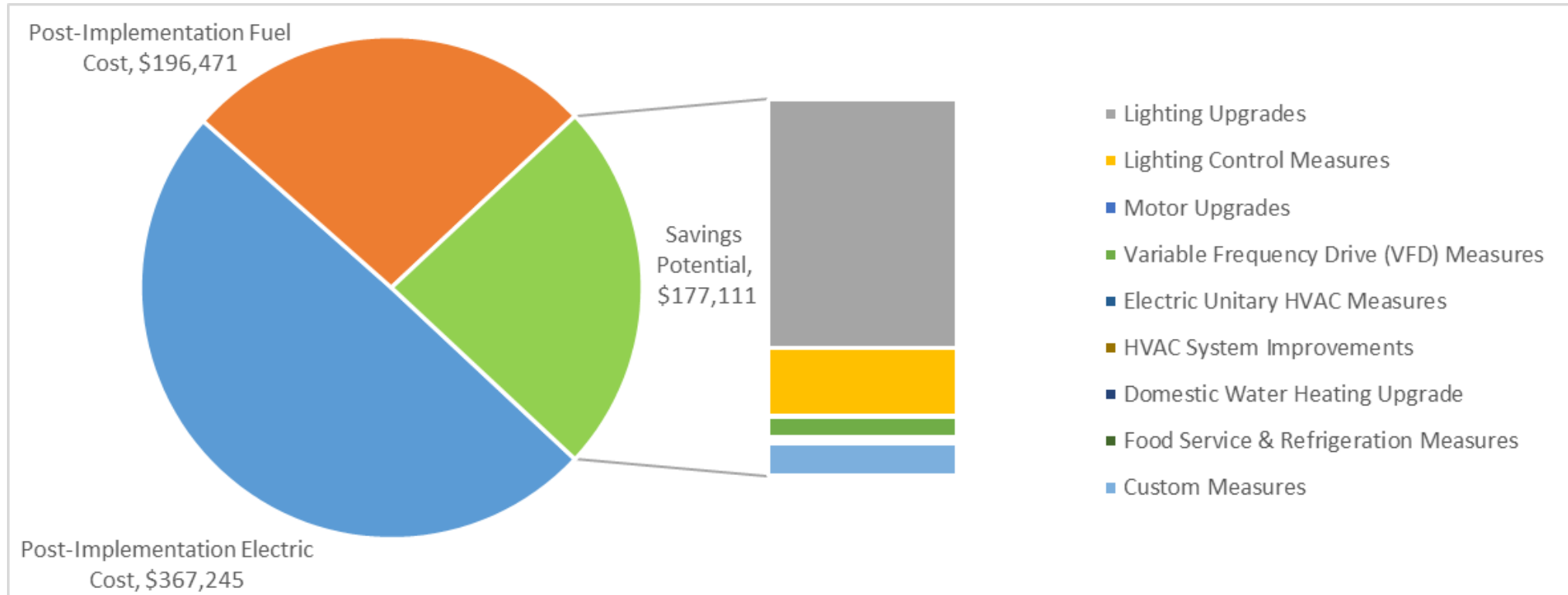
ENERGY STAR® scores are percentile ranking from 1 (least efficient) to 100 (most efficient). It compares your building's energy performance to similar buildings nationwide.

BENCHMARKING



ALL OPPORTUNITIES

Savings Potential



ALL OPPORTUNITIES

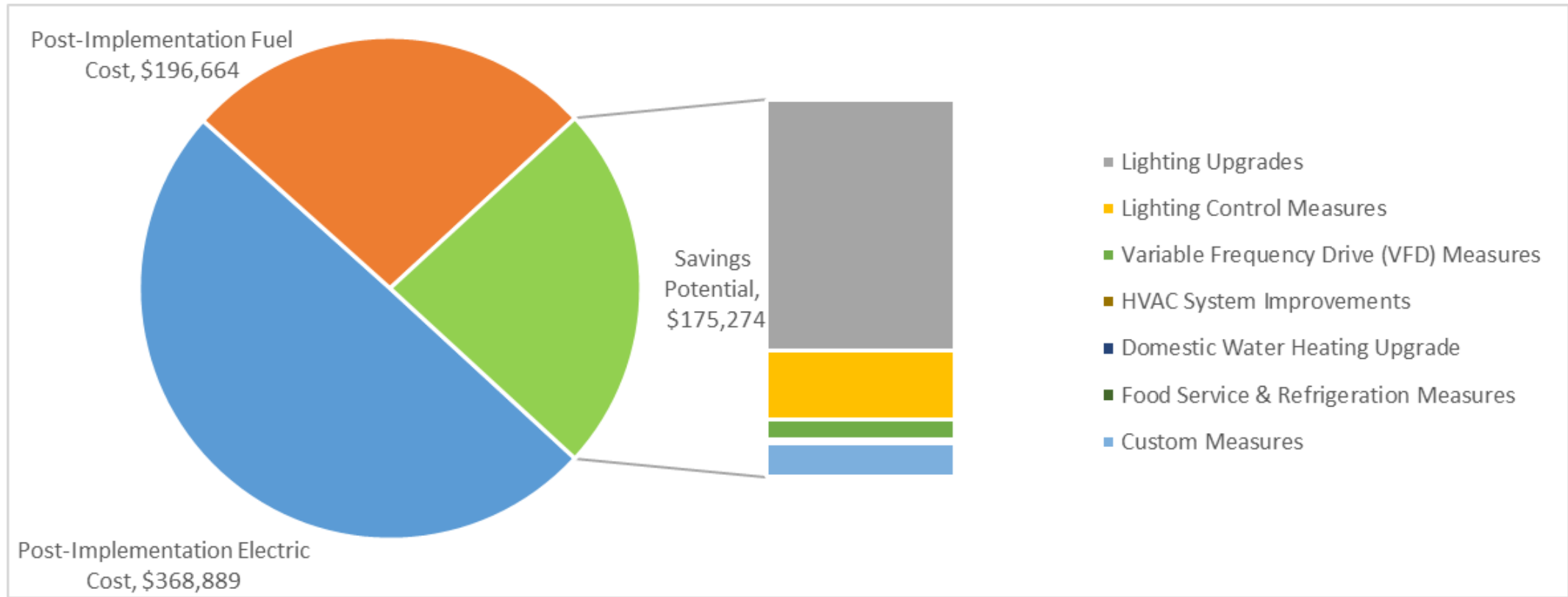
| # | Energy Conservation Measure | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings (\$) | Estimated M&L Cost (\$) | Estimated Incentive (\$)* | Estimated Net M&L Cost (\$) | Simple Payback Period (yrs)** | CO ₂ e Reduction (lbs) |
|--|--|-------------------------------|--------------------------|-----------------------------|---------------------------------|-------------------------|---------------------------|-----------------------------|-------------------------------|-----------------------------------|
| Lighting Upgrades | | 845,787 | 126.1 | -164.1 | \$116,855 | \$291,860 | \$57,115 | \$234,745 | 2.0 | 832,481 |
| ECM 1 | Install LED Fixtures | 89,667 | 4.5 | -6.8 | \$15,223 | \$79,923 | \$3,820 | \$76,103 | 5.0 | 89,497 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | 355 | 0.2 | 0.0 | \$62 | \$326 | \$50 | \$276 | 4.4 | 353 |
| ECM 3 | Retrofit Fixtures with LED Lamps | 755,765 | 121.4 | -157.3 | \$101,569 | \$211,611 | \$53,245 | \$158,366 | 1.6 | 742,631 |
| Lighting Control Measures | | 240,047 | 36.7 | -50.2 | \$32,085 | \$148,041 | \$39,965 | \$108,076 | 3.4 | 235,850 |
| ECM 4 | Install Occupancy Sensor Lighting Controls | 185,584 | 29.4 | -38.8 | \$24,777 | \$114,516 | \$14,420 | \$100,096 | 4.0 | 182,340 |
| ECM 5 | Install High/Low Lighting Controls | 54,463 | 7.3 | -11.4 | \$7,308 | \$33,525 | \$25,545 | \$7,980 | 1.1 | 53,510 |
| Motor Upgrades | | 1,587 | 0.4 | 0.0 | \$224 | \$5,914 | \$0 | \$5,914 | 26.4 | 1,599 |
| ECM 6 | Premium Efficiency Motors | 1,587 | 0.4 | 0.0 | \$224 | \$5,914 | \$0 | \$5,914 | 26.4 | 1,599 |
| Variable Frequency Drive (VFD) Measures | | 65,341 | 8.6 | 104.3 | \$9,761 | \$69,160 | \$3,400 | \$65,760 | 6.7 | 78,007 |
| ECM 7 | Install VFDs on Constant Volume (CV) Fans | 26,936 | 5.4 | 0.0 | \$3,607 | \$25,691 | \$1,175 | \$24,516 | 6.8 | 27,124 |
| ECM 8 | Install VFDs on Heating Water Pumps | 24,883 | 3.1 | 0.0 | \$3,608 | \$33,297 | \$2,000 | \$31,297 | 8.7 | 25,057 |
| ECM 9 | Install VFDs on Kitchen Hood Fan Motors | 13,522 | 0.1 | 104.3 | \$2,546 | \$10,172 | \$225 | \$9,947 | 3.9 | 25,825 |
| Electric Unitary HVAC Measures | | 7,067 | 6.4 | 9.8 | \$1,044 | \$62,561 | \$2,040 | \$60,522 | 58.0 | 8,269 |
| ECM 10 | Install High Efficiency Air Conditioning Units | 5,478 | 5.2 | 9.8 | \$829 | \$47,037 | \$2,040 | \$44,998 | 54.3 | 6,670 |
| ECM 11 | Install High Efficiency Heat Pumps | 1,589 | 1.3 | 0.0 | \$214 | \$15,524 | \$0 | \$15,524 | 72.4 | 1,600 |
| HVAC System Improvements | | 1,330 | 0.0 | 81.3 | \$853 | \$1,123 | \$314 | \$809 | 0.9 | 10,856 |
| ECM 12 | Install Pipe Insulation | 1,330 | 0.0 | 81.3 | \$853 | \$1,123 | \$314 | \$809 | 0.9 | 10,856 |
| Domestic Water Heating Upgrade | | 1,529 | 0.0 | 69.2 | \$760 | \$7,173 | \$889 | \$6,283 | 8.3 | 9,647 |
| ECM 13 | Install High Efficiency Gas-Fired Water Heater | 0 | 0.0 | 14.7 | \$127 | \$6,269 | \$438 | \$5,832 | 45.8 | 1,719 |
| ECM 14 | Install Low-Flow DHW Devices | 1,529 | 0.0 | 54.6 | \$633 | \$903 | \$452 | \$452 | 0.7 | 7,929 |
| Food Service & Refrigeration Measures | | 1,612 | 0.2 | 0.0 | \$212 | \$230 | \$50 | \$180 | 0.9 | 1,623 |
| ECM 15 | Vending Machine Control | 1,612 | 0.2 | 0.0 | \$212 | \$230 | \$50 | \$180 | 0.9 | 1,623 |
| Custom Measures | | 74,634 | 0.0 | 746.3 | \$15,317 | \$106,345 | \$0 | \$106,345 | 6.9 | 162,543 |
| ECM 16 | Retro-Commissioning Study | 74,634 | 0.0 | 746.3 | \$15,317 | \$106,345 | \$0 | \$106,345 | 6.9 | 162,543 |
| TOTALS | | 1,238,935 | 178.3 | 796.6 | \$177,111 | \$692,407 | \$103,773 | \$588,635 | 3.3 | 1,340,875 |

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

** - 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 M&L Cost (\$) | Estimated Incentive (\$)* | Estimated Net M&L Cost (\$) | Simple Payback Period (yrs)** | CO ₂ e Emissions Reduction (lbs) |
|--|--|-------------------------------|--------------------------|-----------------------------|---------------------------------|-------------------------|---------------------------|-----------------------------|-------------------------------|---|
| Lighting Upgrades | | 845,787 | 126.1 | -164.1 | \$116,855 | \$291,860 | \$57,115 | \$234,745 | 2.0 | 832,481 |
| ECM 1 | Install LED Fixtures | 89,667 | 4.5 | -6.8 | \$15,223 | \$79,923 | \$3,820 | \$76,103 | 5.0 | 89,497 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | 355 | 0.2 | 0.0 | \$62 | \$326 | \$50 | \$276 | 4.4 | 353 |
| ECM 3 | Retrofit Fixtures with LED Lamps | 755,765 | 121.4 | -157.3 | \$101,569 | \$211,611 | \$53,245 | \$158,366 | 1.6 | 742,631 |
| Lighting Control Measures | | 239,997 | 36.6 | -50.2 | \$32,073 | \$146,961 | \$39,825 | \$107,136 | 3.3 | 235,799 |
| ECM 4 | Install Occupancy Sensor Lighting Controls | 185,534 | 29.3 | -38.8 | \$24,765 | \$113,436 | \$14,280 | \$99,156 | 4.0 | 182,289 |
| ECM 5 | Install High/Low Lighting Controls | 54,463 | 7.3 | -11.4 | \$7,308 | \$33,525 | \$25,545 | \$7,980 | 1.1 | 53,510 |
| Variable Frequency Drive (VFD) Measures | | 62,456 | 8.2 | 104.3 | \$9,331 | \$62,379 | \$3,250 | \$59,129 | 6.3 | 75,101 |
| ECM 7 | Install VFDs on Constant Volume (CV) Fans | 26,936 | 5.4 | 0.0 | \$3,607 | \$25,691 | \$1,175 | \$24,516 | 6.8 | 27,124 |
| ECM 8 | Install VFDs on Heating Water Pumps | 21,998 | 2.7 | 0.0 | \$3,177 | \$26,516 | \$1,850 | \$24,666 | 7.8 | 22,152 |
| HVAC System Improvements | | 1,330 | 0.0 | 81.3 | \$853 | \$1,123 | \$314 | \$809 | 0.9 | 10,856 |
| ECM 12 | Install Pipe Insulation | 1,330 | 0.0 | 81.3 | \$853 | \$1,123 | \$314 | \$809 | 0.9 | 10,856 |
| Domestic Water Heating Upgrade | | 1,529 | 0.0 | 54.6 | \$633 | \$903 | \$452 | \$452 | 0.7 | 7,929 |
| ECM 14 | Install Low-Flow DHW Devices | 1,529 | 0.0 | 54.6 | \$633 | \$903 | \$452 | \$452 | 0.7 | 7,929 |
| Food Service & Refrigeration Measures | | 1,612 | 0.2 | 0.0 | \$212 | \$230 | \$50 | \$180 | 0.9 | 1,623 |
| ECM 15 | Vending Machine Control | 1,612 | 0.2 | 0.0 | \$212 | \$230 | \$50 | \$180 | 0.9 | 1,623 |
| Custom Measures | | 74,634 | 0.0 | 746.3 | \$15,317 | \$106,345 | \$0 | \$106,345 | 6.9 | 162,543 |
| ECM 16 | Retro-Commissioning Study | 74,634 | 0.0 | 746.3 | \$15,317 | \$106,345 | \$0 | \$106,345 | 6.9 | 162,543 |
| TOTALS | | 1,227,345 | 171.1 | 772.1 | \$175,274 | \$609,802 | \$101,006 | \$508,796 | 2.9 | 1,326,332 |

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

HAMILTON 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 ₂ e Emissions Reduction (lbs) |
|---|--|-----------------|-------------------------------|--------------------------|-----------------------------|---------------------------------|-------------------------|---------------------------|-----------------------------|-------------------------------|---|
| Lighting Upgrades | | | 57,586 | 11.2 | -12 | \$7,940 | \$20,883 | \$5,067 | \$15,816 | 2.0 | 56,629 |
| ECM 1 | Install LED Fixtures | Yes | 2,644 | 0.1 | 0 | \$368 | \$2,226 | \$170 | \$2,056 | 5.6 | 2,644 |
| ECM 2 | Retrofit Fixtures with LED Lamps | Yes | 54,942 | 11.1 | -11 | \$7,572 | \$18,657 | \$4,897 | \$13,760 | 1.8 | 53,985 |
| Lighting Control Measures | | | 17,444 | 3.5 | -4 | \$2,404 | \$14,002 | \$3,785 | \$10,217 | 4.2 | 17,139 |
| ECM 3 | Install Occupancy Sensor Lighting Controls | Yes | 13,197 | 2.8 | -3 | \$1,819 | \$11,302 | \$1,405 | \$9,897 | 5.4 | 12,967 |
| ECM 4 | Install High/Low Lighting Controls | Yes | 4,247 | 0.7 | -1 | \$585 | \$2,700 | \$2,380 | \$320 | 0.5 | 4,173 |
| Motor Upgrades | | | 1,345 | 0.3 | 0 | \$188 | \$3,693 | \$0 | \$3,693 | 19.7 | 1,355 |
| ECM 5 | Premium Efficiency Motors | No | 1,345 | 0.3 | 0 | \$188 | \$3,693 | \$0 | \$3,693 | 19.7 | 1,355 |
| Domestic Water Heating Upgrade | | | 0 | 0.0 | 23 | \$197 | \$6,391 | \$498 | \$5,893 | 29.9 | 2,663 |
| ECM 6 | Install High Efficiency Gas-Fired Water Heater | No | 0 | 0.0 | 15 | \$127 | \$6,269 | \$438 | \$5,832 | 45.8 | 1,719 |
| ECM 7 | Install Low-Flow DHW Devices | Yes | 0 | 0.0 | 8 | \$70 | \$122 | \$61 | \$61 | 0.9 | 944 |
| TOTALS (COST EFFECTIVE MEASURES) | | | 75,031 | 14.7 | -7 | \$10,414 | \$35,007 | \$8,913 | \$26,094 | 2.5 | 74,713 |
| TOTALS (ALL MEASURES) | | | 76,376 | 15.0 | 7 | \$10,730 | \$44,969 | \$9,350 | \$35,619 | 3.3 | 77,786 |

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

CENTRAL 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 ₂ e Emissions Reduction (lbs) |
|--|--|-----------------|-------------------------------|--------------------------|-----------------------------|---------------------------------|-------------------------|---------------------------|-----------------------------|-------------------------------|---|
| Lighting Upgrades | | | 75,843 | 14.3 | -15 | \$10,646 | \$29,827 | \$6,827 | \$23,000 | 2.2 | 74,638 |
| ECM 1 | Install LED Fixtures | Yes | 4,406 | 0.0 | 0 | \$625 | \$2,487 | \$400 | \$2,087 | 3.3 | 4,437 |
| ECM 2 | Retrofit Fixtures with LED Lamps | Yes | 71,437 | 14.3 | -15 | \$10,020 | \$27,340 | \$6,427 | \$20,913 | 2.1 | 70,201 |
| Lighting Control Measures | | | 23,771 | 4.7 | -5 | \$3,334 | \$15,946 | \$3,990 | \$11,956 | 3.6 | 23,355 |
| ECM 3 | Install Occupancy Sensor Lighting Controls | Yes | 20,443 | 4.1 | -4 | \$2,867 | \$12,346 | \$1,615 | \$10,731 | 3.7 | 20,085 |
| ECM 4 | Install High/Low Lighting Controls | Yes | 3,328 | 0.6 | -1 | \$467 | \$3,600 | \$2,375 | \$1,225 | 2.6 | 3,270 |
| Variable Frequency Drive (VFD) Measures | | | 16,768 | 2.6 | 0 | \$2,380 | \$19,420 | \$1,000 | \$18,420 | 7.7 | 16,885 |
| ECM 5 | Install VFDs on Constant Volume (CV) Fans | Yes | 3,508 | 0.9 | 0 | \$498 | \$3,884 | \$200 | \$3,684 | 7.4 | 3,533 |
| ECM 6 | Install VFDs on Heating Water Pumps | Yes | 13,260 | 1.7 | 0 | \$1,882 | \$15,536 | \$800 | \$14,736 | 7.8 | 13,352 |
| Unitary HVAC Measures | | | 426 | 0.4 | 0 | \$61 | \$7,396 | \$0 | \$7,396 | 122.2 | 429 |
| ECM 7 | Install High Efficiency Air Conditioning Units | No | 426 | 0.4 | 0 | \$61 | \$7,396 | \$0 | \$7,396 | 122.2 | 429 |
| HVAC System Improvements | | | 0 | 0.0 | 44 | \$357 | \$555 | \$140 | \$415 | 1.2 | 5,190 |
| ECM 8 | Install Pipe Insulation | Yes | 0 | 0.0 | 44 | \$357 | \$555 | \$140 | \$415 | 1.2 | 5,190 |
| Domestic Water Heating Upgrade | | | 0 | 0.0 | 10 | \$84 | \$158 | \$79 | \$79 | 0.9 | 1,222 |
| ECM 9 | Install Low-Flow DHW Devices | Yes | 0 | 0.0 | 10 | \$84 | \$158 | \$79 | \$79 | 0.9 | 1,222 |
| TOTALS (COST EFFECTIVE MEASURES) | | | 116,382 | 21.6 | 35 | \$16,801 | \$65,906 | \$12,036 | \$53,870 | 3.2 | 121,290 |
| TOTALS (ALL MEASURES) | | | 116,808 | 22.0 | 35 | \$16,861 | \$73,302 | \$12,036 | \$61,266 | 3.6 | 121,720 |

* - 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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COLEMAN 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 ₂ e Emissions Reduction (lbs) |
|--|--|-----------------|-------------------------------|--------------------------|-----------------------------|---------------------------------|-------------------------|---------------------------|-----------------------------|-------------------------------|---|
| Lighting Upgrades | | | 73,896 | 15.6 | -14 | \$10,841 | \$33,847 | \$7,573 | \$26,274 | 2.4 | 72,779 |
| ECM 1 | Install LED Fixtures | Yes | 6,890 | 0.0 | 0 | \$1,021 | \$3,804 | \$550 | \$3,254 | 3.2 | 6,938 |
| ECM 2 | Retrofit Fixtures with LED Lamps | Yes | 67,007 | 15.6 | -14 | \$9,820 | \$30,043 | \$7,023 | \$23,020 | 2.3 | 65,841 |
| Lighting Control Measures | | | 11,363 | 2.1 | -2 | \$1,665 | \$8,912 | \$3,740 | \$5,172 | 3.1 | 11,164 |
| ECM 3 | Install Occupancy Sensor Lighting Controls | Yes | 5,353 | 1.0 | -1 | \$784 | \$4,862 | \$485 | \$4,377 | 5.6 | 5,259 |
| ECM 4 | Install High/Low Lighting Controls | Yes | 6,011 | 1.2 | -1 | \$881 | \$4,050 | \$3,255 | \$795 | 0.9 | 5,905 |
| Variable Frequency Drive (VFD) Measures | | | 10,662 | 1.7 | 0 | \$1,580 | \$14,241 | \$1,150 | \$13,091 | 8.3 | 10,736 |
| ECM 5 | Install VFDs on Constant Volume (CV) Fans | Yes | 1,923 | 0.6 | 0 | \$285 | \$3,261 | \$100 | \$3,161 | 11.1 | 1,937 |
| ECM 6 | Install VFDs on Heating Water Pumps | Yes | 8,738 | 1.1 | 0 | \$1,295 | \$10,980 | \$1,050 | \$9,930 | 7.7 | 8,799 |
| HVAC System Improvements | | | 0 | 0.0 | 16 | \$131 | \$195 | \$60 | \$135 | 1.0 | 1,899 |
| ECM 7 | Install Pipe Insulation | Yes | 0 | 0.0 | 16 | \$131 | \$195 | \$60 | \$135 | 1.0 | 1,899 |
| Domestic Water Heating Upgrade | | | 0 | 0.0 | 6 | \$50 | \$93 | \$47 | \$47 | 0.9 | 722 |
| ECM 8 | Install Low-Flow DHW Devices | Yes | 0 | 0.0 | 6 | \$50 | \$93 | \$47 | \$47 | 0.9 | 722 |
| TOTALS (COST EFFECTIVE MEASURES) | | | 95,921 | 19.4 | 6 | \$14,267 | \$57,288 | \$12,570 | \$44,718 | 3.1 | 97,301 |
| TOTALS (ALL MEASURES) | | | 95,921 | 19.4 | 6 | \$14,267 | \$57,288 | \$12,570 | \$44,718 | 3.1 | 97,301 |

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

BYRD 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 ₂ e Emissions Reduction (lbs) |
|--|--|-----------------|-------------------------------|--------------------------|-----------------------------|---------------------------------|-------------------------|---------------------------|-----------------------------|-------------------------------|---|
| Lighting Upgrades | | | 69,822 | 13.2 | -13 | \$10,304 | \$27,575 | \$6,731 | \$20,844 | 2.0 | 68,741 |
| ECM 1 | Install LED Fixtures | Yes | 5,637 | 0.0 | 0 | \$841 | \$3,112 | \$450 | \$2,662 | 3.2 | 5,676 |
| ECM 2 | Retrofit Fixtures with LED Lamps | Yes | 64,185 | 13.2 | -13 | \$9,464 | \$24,463 | \$6,281 | \$18,182 | 1.9 | 63,065 |
| Lighting Control Measures | | | 19,537 | 3.9 | -4 | \$2,880 | \$14,075 | \$3,550 | \$10,525 | 3.7 | 19,195 |
| ECM 3 | Install Occupancy Sensor Lighting Controls | Yes | 15,607 | 3.2 | -3 | \$2,301 | \$11,150 | \$1,380 | \$9,770 | 4.2 | 15,334 |
| ECM 4 | Install High/Low Lighting Controls | Yes | 3,930 | 0.8 | -1 | \$579 | \$2,925 | \$2,170 | \$755 | 1.3 | 3,862 |
| Motor Upgrades | | | 242 | 0.1 | 0 | \$36 | \$2,221 | \$0 | \$2,221 | 61.4 | 244 |
| ECM 5 | Premium Efficiency Motors | No | 242 | 0.1 | 0 | \$36 | \$2,221 | \$0 | \$2,221 | 61.4 | 244 |
| Variable Frequency Drive (VFD) Measures | | | 2,885 | 0.3 | 0 | \$430 | \$6,781 | \$150 | \$6,631 | 15.4 | 2,905 |
| ECM 6 | Install VFDs on Heating Water Pumps | No | 2,885 | 0.3 | 0 | \$430 | \$6,781 | \$150 | \$6,631 | 15.4 | 2,905 |
| Unitary HVAC Measures | | | 1,795 | 2.3 | 7 | \$329 | \$22,788 | \$927 | \$21,861 | 66.5 | 2,675 |
| ECM 7 | Install High Efficiency Air Conditioning Units | No | 1,476 | 1.8 | 7 | \$281 | \$17,613 | \$927 | \$16,686 | 59.3 | 2,354 |
| ECM 8 | Install High Efficiency Heat Pumps | No | 319 | 0.4 | 0 | \$48 | \$5,175 | \$0 | \$5,175 | 108.8 | 321 |
| HVAC System Improvements | | | 0 | 0.0 | 11 | \$88 | \$117 | \$28 | \$89 | 1.0 | 1,253 |
| ECM 9 | Install Pipe Insulation | Yes | 0 | 0.0 | 11 | \$88 | \$117 | \$28 | \$89 | 1.0 | 1,253 |
| Domestic Water Heating Upgrade | | | 0 | 0.0 | 9 | \$74 | \$136 | \$68 | \$68 | 0.9 | 1,056 |
| ECM 10 | Install Low-Flow DHW Devices | Yes | 0 | 0.0 | 9 | \$74 | \$136 | \$68 | \$68 | 0.9 | 1,056 |
| TOTALS (COST EFFECTIVE MEASURES) | | | 89,359 | 17.2 | 2 | \$13,347 | \$41,904 | \$10,377 | \$31,527 | 2.4 | 90,245 |
| TOTALS (ALL MEASURES) | | | 94,281 | 19.9 | 10 | \$14,143 | \$73,693 | \$11,454 | \$62,239 | 4.4 | 96,070 |

* - 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.

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

GLEN ROCK MIDDLE/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 ₂ e Emissions Reduction (lbs) |
|--|--|-----------------|-------------------------------|--------------------------|-----------------------------|---------------------------------|-------------------------|---------------------------|-----------------------------|-------------------------------|---|
| Lighting Upgrades | | | 537,838 | 71.5 | -110 | \$69,821 | \$134,386 | \$30,836 | \$103,550 | 1.5 | 528,678 |
| ECM 1 | Install LED Fixtures | Yes | 39,714 | 4.3 | -7 | \$5,167 | \$23,293 | \$2,250 | \$21,043 | 4.1 | 39,214 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | Yes | 207 | 0.1 | 0 | \$27 | \$257 | \$40 | \$217 | 8.1 | 203 |
| ECM 3 | Retrofit Fixtures with LED Lamps | Yes | 497,918 | 67.0 | -104 | \$64,627 | \$110,835 | \$28,546 | \$82,289 | 1.3 | 489,261 |
| Lighting Control Measures | | | 167,881 | 22.4 | -35 | \$21,789 | \$94,026 | \$24,760 | \$69,266 | 3.2 | 164,945 |
| ECM 4 | Install Occupancy Sensor Lighting Controls | Yes | 130,934 | 18.3 | -27 | \$16,994 | \$73,776 | \$9,395 | \$64,381 | 3.8 | 128,644 |
| ECM 5 | Install High/Low Lighting Controls | Yes | 36,947 | 4.0 | -8 | \$4,795 | \$20,250 | \$15,365 | \$4,885 | 1.0 | 36,301 |
| Variable Frequency Drive (VFD) Measures | | | 35,026 | 4.0 | 104 | \$5,371 | \$28,718 | \$1,100 | \$27,618 | 5.1 | 47,480 |
| ECM 6 | Install VFDs on Constant Volume (CV) Fans | Yes | 21,504 | 3.9 | 0 | \$2,824 | \$18,546 | \$875 | \$17,671 | 6.3 | 21,655 |
| ECM 7 | Install VFDs on Kitchen Hood Fan Motors | Yes | 13,522 | 0.1 | 104 | \$2,546 | \$10,172 | \$225 | \$9,947 | 3.9 | 25,825 |
| Unitary HVAC Measures | | | 4,845 | 3.8 | 2 | \$654 | \$32,378 | \$1,113 | \$31,265 | 47.8 | 5,165 |
| ECM 8 | Install High Efficiency Air Conditioning Units | No | 3,576 | 3.0 | 2 | \$488 | \$22,028 | \$1,113 | \$20,916 | 42.9 | 3,886 |
| ECM 9 | Install High Efficiency Heat Pumps | No | 1,270 | 0.8 | 0 | \$167 | \$10,349 | \$0 | \$10,349 | 62.1 | 1,279 |
| HVAC System Improvements | | | 1,061 | 0.0 | 10 | \$213 | \$170 | \$56 | \$114 | 0.5 | 2,241 |
| ECM 10 | Install Pipe Insulation | Yes | 1,061 | 0.0 | 10 | \$213 | \$170 | \$56 | \$114 | 0.5 | 2,241 |
| Domestic Water Heating Upgrade | | | 1,529 | 0.0 | 21 | \$355 | \$394 | \$197 | \$197 | 0.6 | 3,984 |
| ECM 11 | Install Low-Flow DHW Devices | Yes | 1,529 | 0.0 | 21 | \$355 | \$394 | \$197 | \$197 | 0.6 | 3,984 |
| Food Service & Refrigeration Measures | | | 1,612 | 0.2 | 0 | \$212 | \$230 | \$50 | \$180 | 0.9 | 1,623 |
| ECM 12 | Vending Machine Control | Yes | 1,612 | 0.2 | 0 | \$212 | \$230 | \$50 | \$180 | 0.9 | 1,623 |
| Custom Measures | | | 74,634 | 0.0 | 746 | \$15,317 | \$106,345 | \$0 | \$106,345 | 6.9 | 162,543 |
| ECM 13 | Retro-Commissioning Study | Yes | 74,634 | 0.0 | 746 | \$15,317 | \$106,345 | \$0 | \$106,345 | 6.9 | 162,543 |
| TOTALS (COST EFFECTIVE MEASURES) | | | 819,582 | 98.0 | 736 | \$113,078 | \$364,269 | \$56,999 | \$307,270 | 2.7 | 911,495 |
| TOTALS (ALL MEASURES) | | | 824,427 | 101.8 | 738 | \$113,732 | \$396,647 | \$58,112 | \$338,535 | 3.0 | 916,660 |

* - 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.

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

GLEN ROCK STADIUM/FOOD STAND/FIELD HOUSE

| # | 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 ₂ e Emissions Reduction (lbs) |
|----------------------------------|--|-----------------|-------------------------------|--------------------------|-----------------------------|---------------------------------|-------------------------|---------------------------|-----------------------------|-------------------------------|---|
| Lighting Upgrades | | | 30,800 | 0.2 | 0 | \$7,302 | \$45,342 | \$81 | \$45,261 | 6.2 | 31,016 |
| ECM 1 | Install LED Fixtures | Yes | 30,375 | 0.0 | 0 | \$7,201 | \$45,000 | \$0 | \$45,000 | 6.2 | 30,587 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | Yes | 149 | 0.0 | 0 | \$35 | \$69 | \$10 | \$59 | 1.7 | 150 |
| ECM 3 | Retrofit Fixtures with LED Lamps | Yes | 276 | 0.1 | 0 | \$66 | \$273 | \$71 | \$202 | 3.1 | 278 |
| Lighting Control Measures | | | 50 | 0.1 | 0 | \$12 | \$1,080 | \$140 | \$940 | 78.9 | 51 |
| ECM 4 | Install Occupancy Sensor Lighting Controls | No | 50 | 0.1 | 0 | \$12 | \$1,080 | \$140 | \$940 | 78.9 | 51 |
| HVAC System Improvements | | | 270 | 0.0 | 0 | \$64 | \$87 | \$30 | \$57 | 0.9 | 272 |
| ECM 5 | Install Pipe Insulation | Yes | 270 | 0.0 | 0 | \$64 | \$87 | \$30 | \$57 | 0.9 | 272 |
| TOTALS (ALL MEASURES) | | | 31,120 | 0.3 | 0 | \$7,378 | \$46,508 | \$251 | \$46,257 | 6.3 | 31,338 |

* - 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.

** - 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

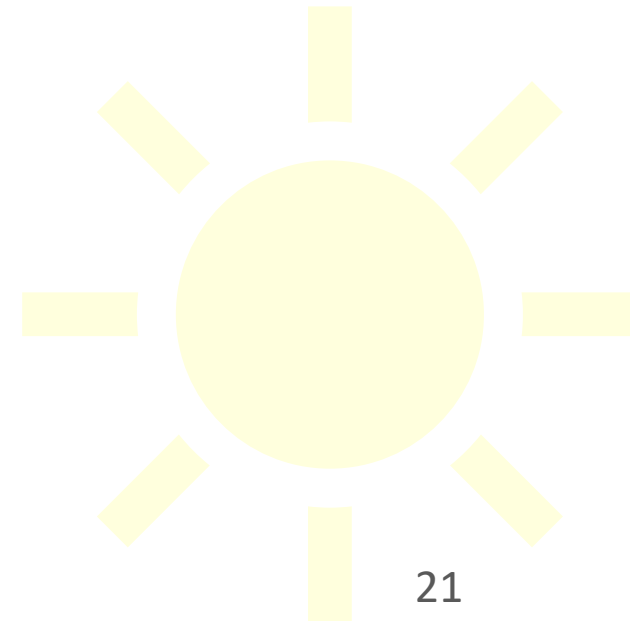
MEASURES FOR FUTURE CONSIDERATION

- Heating System Conversion from Steam to Hot Water

SOLAR ENERGY GENERATION POTENTIAL

NJCleanEnergy.com/renewable-energy

| | Hamilton ES | Central ES | Byrd ES | Glen Rock MS/HS |
|--|-------------|-------------|-------------|-----------------|
| <i>Potential:</i> | HIGH | HIGH | HIGH | HIGH |
| <i>System Potential: (kW)</i> | 72 | 86 | 76 | 603 |
| <i>Electric Generation: (kWh per year)</i> | 85,778 | 102,458 | 90,545 | 718,397 |
| <i>Displaced Cost: (per year)</i> | \$11,980 | \$14,540 | \$13,510 | \$94,350 |

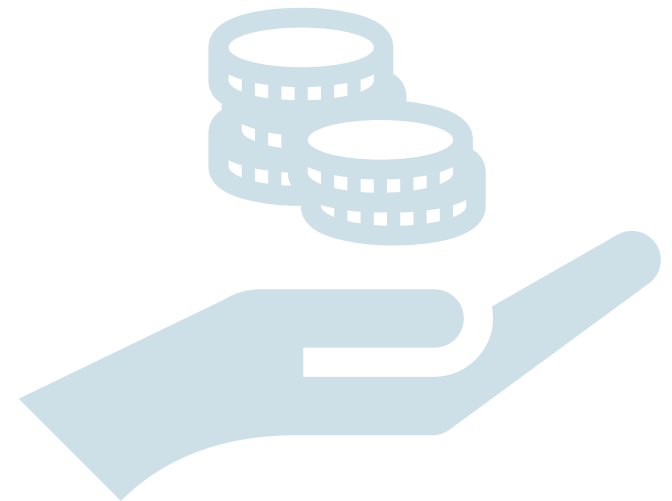


FINANCING MECHANISM: ESIP

NJCleanEnergy.com/ESIP

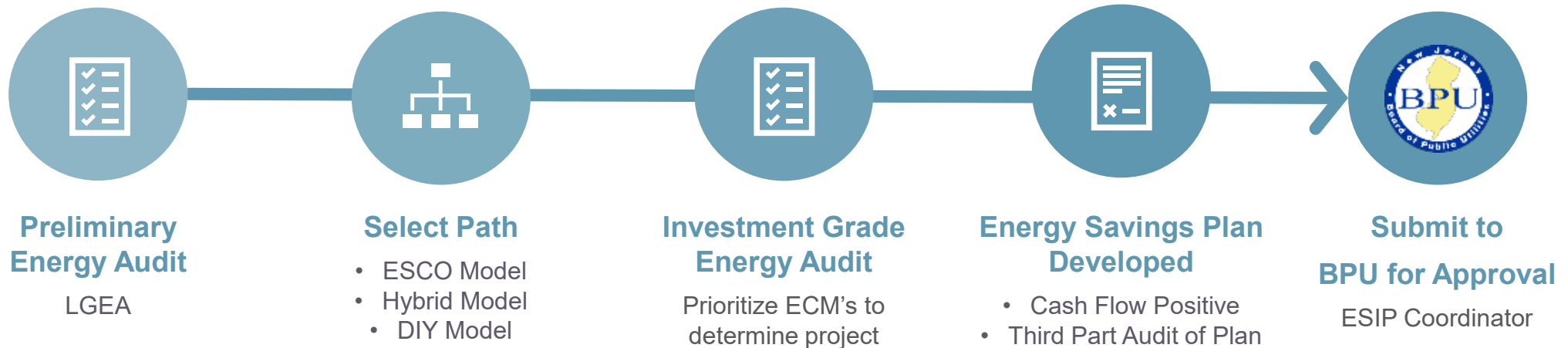
ENERGY SAVINGS IMPROVEMENT PROGRAM (ESIP)

- Energy Performance Contracting – NJ ESIP
- Financing Mechanism that allows state entities to make energy efficiency improvements without impacting their budgets
- Administered by the NJBPU
- NJBPU Approved EE Incentive Programs: NJCEP or Utility
- Project is paid for with the value of its own energy savings
- 15 or 20 year self-funding loan
- Can be combined with Federal/State Pandemic Relief Funds
- No upfront capital expenses
- No referendum is required
- No impact to taxpayers



FINANCING MECHANISM: ESIP

NJCleanEnergy.com/EV



ENERGY SAVINGS IMPROVEMENT PROGRAM

NJCleanEnergy.com/ESIP

FOR MORE INFORMATION

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ESIP Coordinator

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C&I TRANSITION OF ENERGY EFFICIENCY PROGRAMS

NJCleanEnergy.com/Transition

LOCAL
GOVERNMENT
CUSTOMERS

COMMERCIAL &
INSTITUTIONAL
CUSTOMERS

LARGE
ENERGY
CUSTOMERS

EXISTING BUILDINGS

MEASUREMENT & AUDITS

FREE Energy Audits



RETROFITS

Prescriptive & Custom Rebates

Direct Install

Engineered Solutions

And more from
your local utility!



Incentives up
to \$4 million
for eligible projects



NEW CONSTRUCTION

Prescriptive & Custom
Rebates for New
Construction and
Gut Rehabs

Pay for Performance
incentives for
buildings over
50,000 sq. ft.



DISTRIBUTED ENERGY RESOURCES

Combined Heat & Power
and Fuel Cell Installation
Incentives

Microgrid Development

Battery Storage

Muni EV Fleets



Key:

Programs run by investor-owned utility companies



Programs run by NJCEP



UTILITY RUN ENERGY EFFICIENCY PROGRAMS

NJCleanEnergy.com/Transition

PRESCRIPTIVE & CUSTOM REBATES:

- Individual high efficiency equipment rebates for renovation, remodeling, and equipment replacement
- Flexibility to do a little or a lot
- No size requirement

DIRECT INSTALL:

- 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

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



UTILITY RUN ENERGY EFFICIENCY PROGRAMS

PSE&G

Dave Kirsch - David.Kirsch@pseg.com
Steve Barba - Steven.T.Barba@pseg.com

SCHOOL & SMALL BUSINESS ENERGY EFFICIENCY STIMULUS PROGRAM

NJCleanEnergy.com/SSBEE

ABOUT

Provides grants to ensure facilities have functional HVAC systems that are tested, adjusted, and, if necessary or cost effective, repaired, upgraded or replaced to improve performance. (*SSB-VEEVR*)

Provides grants to replace noncompliant plumbing fixtures and appliances that fail to meet water efficiency standards. (*SSB-NPFA*)

REQUIREMENTS

Assessment verified by a Certified Energy Auditor or TAB Technician and proof of noncompliant equipment.

INCENTIVE CAP

Grants shall provide no more than 75% of the approved project cost up to \$5 million.



FOR MORE INFORMATION

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THANK YOU

