



LGEA Presentation

North Haledon Board of Education

January 20, 2023

New Jersey's
Clean Energy Program

Lighting the way to New Jersey's Clean Energy Future

INTRODUCTIONS

- *North Haledon Board of Education*

- Debra Andreniuk – Business Administrator
- Musteba Toska – Maintenance Supervisor

- *NJ Clean Energy Program*

- Sarah Walters – LGEA Project Manager
- Moussa Traore – LGEA Lead Auditor
- Wolff Saint-Fleur – 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**asures (ECMs) identified & other recommendations
- Energy Savings Improvement Program (ESIP)
- Energy Efficiency Incentive Programs
- Questions regarding the draft audit report
- Next steps for North Haledon Board of Education

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
- Kitchen and Refrigeration Equipment

Utility Consumption:

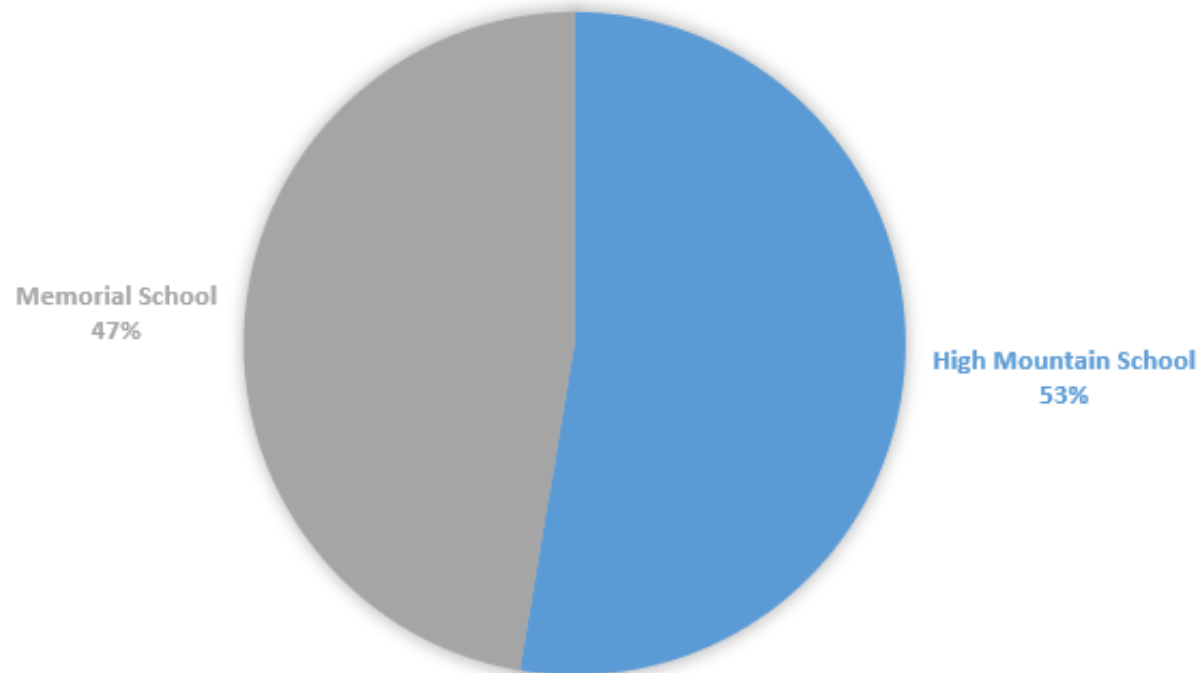
- Electric Consumption and Costs
- Natural Gas Consumption and Costs

Sites Visited/Analyzed

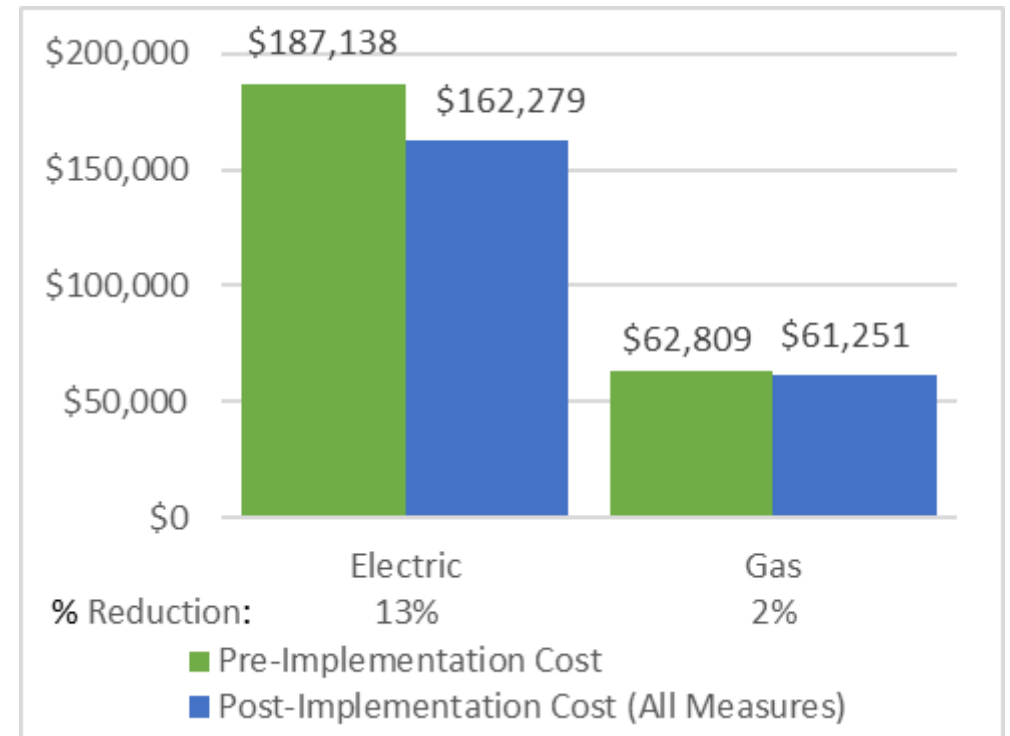
- Memorial Elementary School
- High Mountain School

UTILITY BREAKOUT


Percent of Total Annual Energy Costs



Pre & Post Implementation Cost



BENCHMARKING

**ENERGY STAR®** Statement of Energy Performance
LEARN MORE AT energystar.gov

26
ENERGY STAR®
Score¹

Memorial Elementary School
Primary Property Type: K-12 School
Gross Floor Area (ft²): 60,480
Built: 2007
For Year Ending: August 31, 2022
Date Generated: December 06, 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 Memorial Elementary School 201 Squaw Brook Road North Haledon, New Jersey 07508	Property Owner North Haledon Board of Education 201 Squaw Brook Road North Haledon, NJ 07508 (973) 427-4376	Primary Contact Debra Andreniuk 201 Squaw Brook Road North Haledon, NJ 07508 (973) 427-4376 dandreniuk@nhschools.net
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Property ID: 23775399

Energy Consumption and Energy Use Intensity (EUI)

Site EUI 78.8 kBtu/ft²	Annual Energy by Fuel Natural Gas (kBtu) 2,606,862 (55%) Electric - Grid (kBtu) 2,158,037 (45%)	National Median Comparison National Median Site EUI (kBtu/ft²) 62.4 National Median Source EUI (kBtu/ft²) 115 % Diff from National Median Source EUI 26%
Source EUI 145.2 kBtu/ft²	Annual Emissions Greenhouse Gas Emissions (Metric Tons CO2e/year) 326	

Site EUI
78.8 kBtu/ft²

Source EUI
145.2 kBtu/ft²

National Median Comparison

National Median Site EUI (kBtu/ft²)	62.4
National Median Source EUI (kBtu/ft²)	115
% Diff from National Median Source EUI	26%

Site Name	ENERGY STAR® Score
Memorial Elementary School	26
High Mountain School	10

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

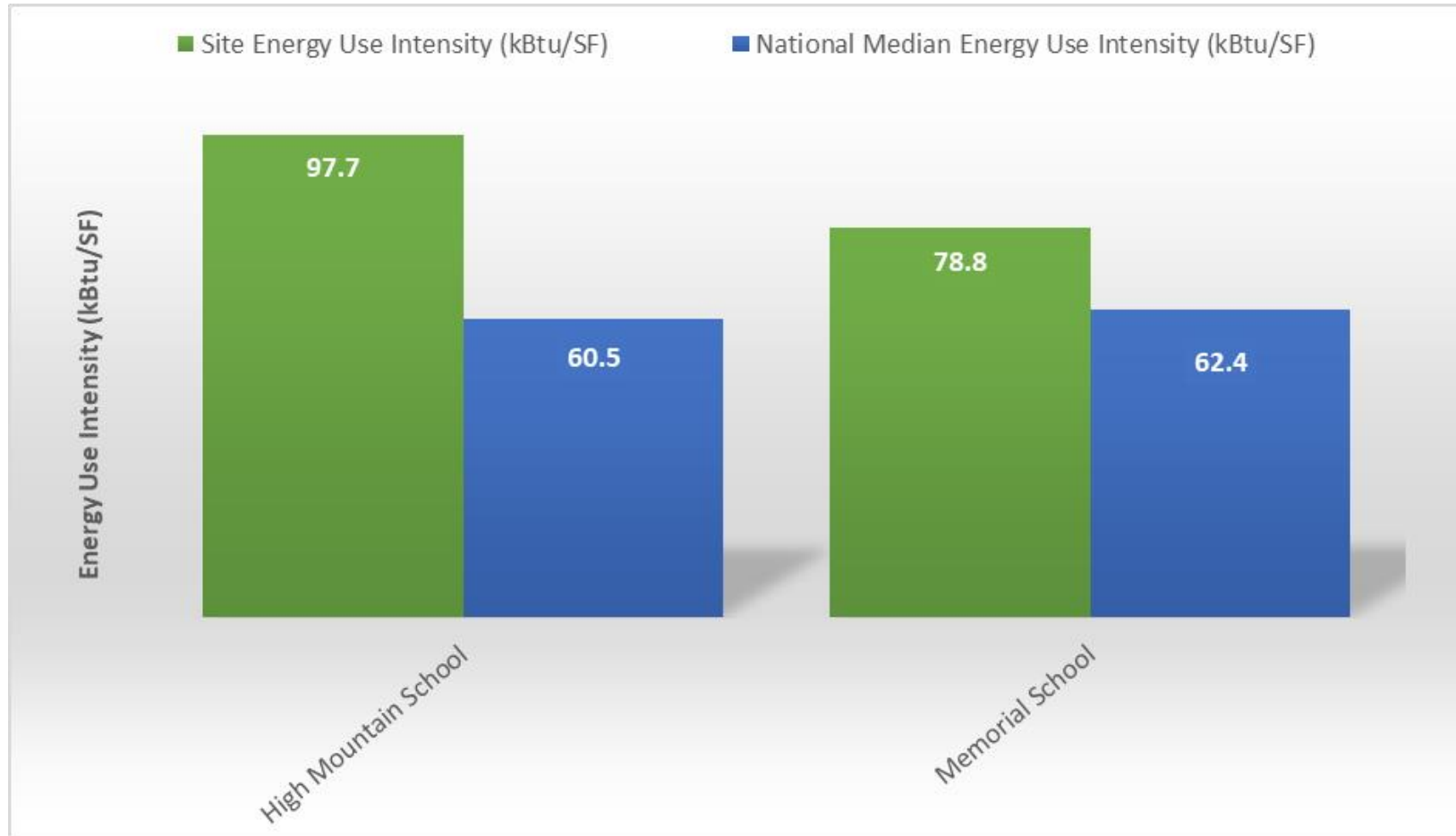
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Professional Engineer or Registered
Architect Stamp
(if applicable)

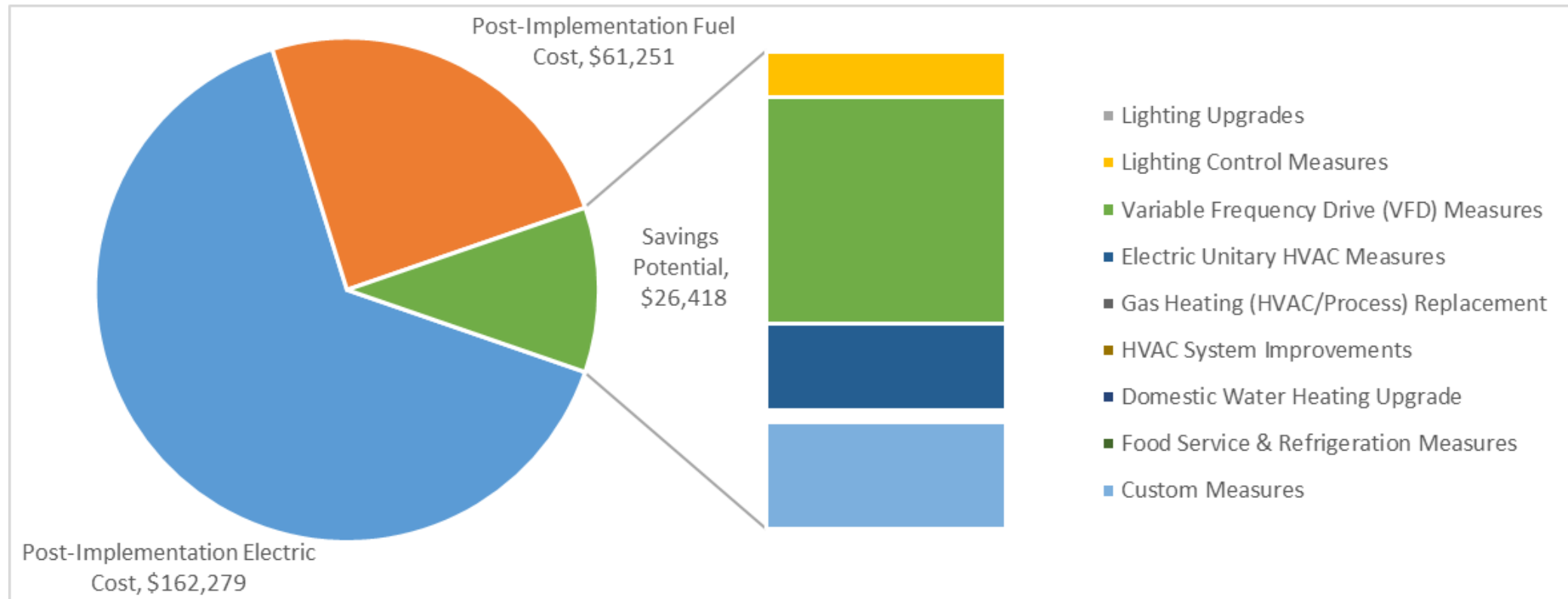
ENERGY STAR® scores are percentile ranking from 1 (least efficient) to 100 (most efficient). It compares your building's energy performance to similar buildings nationwide.

BENCHMARKING



ALL OPPORTUNITIES

Savings Potential



ALL OPPORTUNITIES

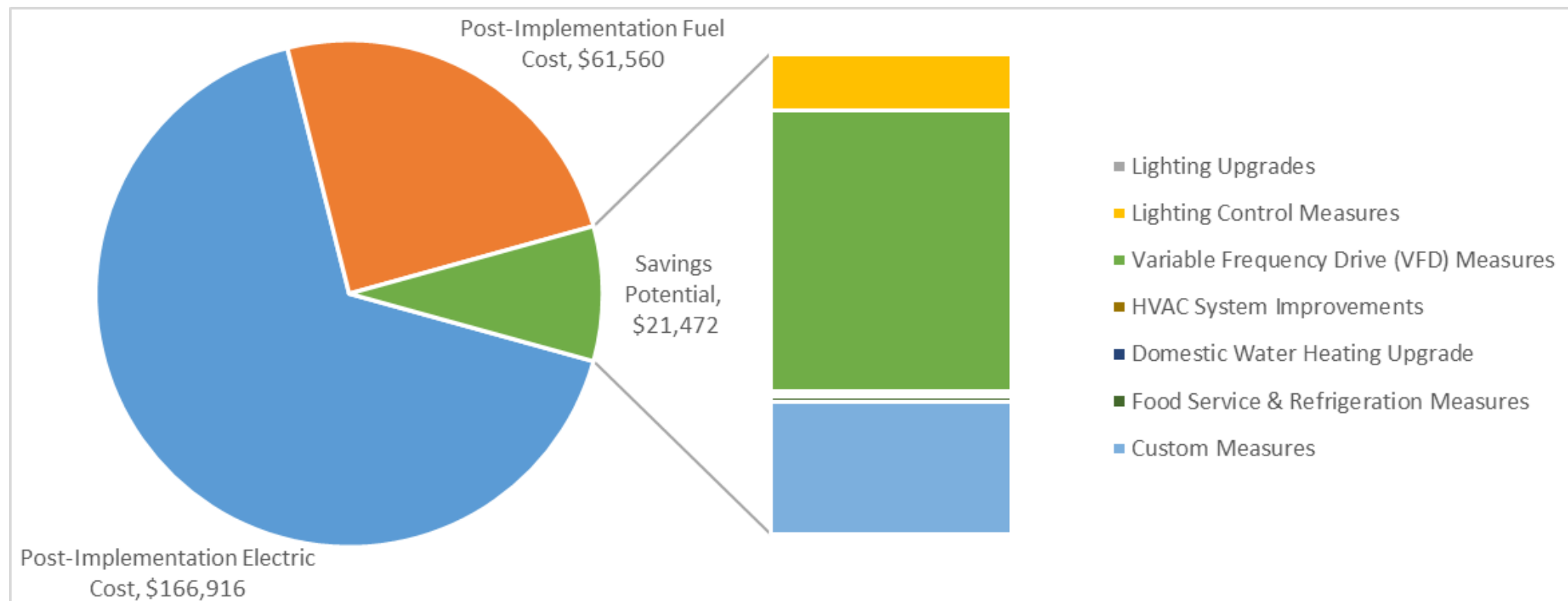
#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		539	0.1	-0.1	\$71	\$349	\$50	\$299	4.2	530
ECM 1	Retrofit Fixtures with LED Lamps	539	0.1	-0.1	\$71	\$349	\$50	\$299	4.2	530
Lighting Control Measures		18,863	3.4	-3.9	\$2,489	\$15,662	\$8,955	\$6,707	2.7	18,533
ECM 2	Install Occupancy Sensor Lighting Controls	8,905	1.7	-1.9	\$1,161	\$4,862	\$625	\$4,237	3.7	8,749
ECM 3	Install High/Low Lighting Controls	9,958	1.8	-2.1	\$1,329	\$10,800	\$8,330	\$2,470	1.9	9,784
Variable Frequency Drive (VFD) Measures		92,243	15.5	13.0	\$12,516	\$95,142	\$6,875	\$88,267	7.1	94,414
ECM 4	Install VFD on Variable Air Volume (VAV) Fans	30,589	5.9	0.0	\$4,389	\$27,606	\$2,475	\$25,131	5.7	30,803
ECM 5	Install VFDs on Constant Volume (CV) Fans	40,933	6.6	0.0	\$5,277	\$45,673	\$1,925	\$43,748	8.3	41,219
ECM 6	Install VFDs on Heating Water Pumps	17,917	3.0	0.0	\$2,310	\$18,354	\$2,400	\$15,954	6.9	18,042
ECM 7	Install VFDs on Kitchen Hood Fan Motors	2,803	0.0	13.0	\$540	\$3,508	\$75	\$3,433	6.4	4,349
Unitary HVAC Measures		33,505	30.2	10.1	\$4,745	\$410,677	\$19,759	\$390,918	82.4	34,921
ECM 8	Install High Efficiency Air Conditioning Units	33,505	30.2	10.1	\$4,745	\$410,677	\$19,759	\$390,918	82.4	34,921
Gas Heating (HVAC/Process) Replacement		0	0.0	18.9	\$201	\$4,532	\$500	\$4,032	20.1	2,216
ECM 9	Install High Efficiency Furnaces	0	0.0	18.9	\$201	\$4,532	\$500	\$4,032	20.1	2,216
HVAC System Improvements		1,303	0.0	0.0	\$187	\$298	\$50	\$248	1.3	1,312
ECM 10	Install Pipe Insulation	1,303	0.0	0.0	\$187	\$298	\$50	\$248	1.3	1,312
Domestic Water Heating Upgrade		491	0.0	0.0	\$70	\$22	\$6	\$16	0.2	494
ECM 11	Install Low-Flow DHW Devices	491	0.0	0.0	\$70	\$22	\$6	\$16	0.2	494
Food Service & Refrigeration Measures		1,716	0.0	0.0	\$221	\$2,496	\$165	\$2,331	10.5	1,728
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	258	0.0	0.0	\$33	\$303	\$40	\$263	7.9	260
ECM 13	Refrigeration Controls	1,458	0.0	0.0	\$188	\$2,193	\$125	\$2,068	11.0	1,468
Custom Measures		34,954	0.0	111.3	\$5,917	\$9,720	\$0	\$9,720	1.6	48,231
ECM 14	Optimize HVAC Schedule	34,954	0.0	111.3	\$5,917	\$9,720	\$0	\$9,720	1.6	48,231
TOTALS		183,613	49.3	149.3	\$26,418	\$538,897	\$36,360	\$502,537	19.0	202,378

* - 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		539	0.1	-0.1	\$71	\$349	\$50	\$299	4.2	530
ECM 1	Retrofit Fixtures with LED Lamps	539	0.1	-0.1	\$71	\$349	\$50	\$299	4.2	530
Lighting Control Measures		18,863	3.4	-3.9	\$2,489	\$15,662	\$8,955	\$6,707	2.7	18,533
ECM 2	Install Occupancy Sensor Lighting Controls	8,905	1.7	-1.9	\$1,161	\$4,862	\$625	\$4,237	3.7	8,749
ECM 3	Install High/Low Lighting Controls	9,958	1.8	-2.1	\$1,329	\$10,800	\$8,330	\$2,470	1.9	9,784
Variable Frequency Drive (VFD) Measures		92,243	15.5	13.0	\$12,516	\$95,142	\$6,875	\$88,267	7.1	94,414
ECM 4	Install VFD on Variable Air Volume (VAV) Fans	30,589	5.9	0.0	\$4,389	\$27,606	\$2,475	\$25,131	5.7	30,803
ECM 5	Install VFDs on Constant Volume (CV) Fans	40,933	6.6	0.0	\$5,277	\$45,673	\$1,925	\$43,748	8.3	41,219
ECM 6	Install VFDs on Heating Water Pumps	17,917	3.0	0.0	\$2,310	\$18,354	\$2,400	\$15,954	6.9	18,042
ECM 7	Install VFDs on Kitchen Hood Fan Motors	2,803	0.0	13.0	\$540	\$3,508	\$75	\$3,433	6.4	4,349
HVAC System Improvements		1,303	0.0	0.0	\$187	\$298	\$50	\$248	1.3	1,312
ECM 10	Install Pipe Insulation	1,303	0.0	0.0	\$187	\$298	\$50	\$248	1.3	1,312
Domestic Water Heating Upgrade		491	0.0	0.0	\$70	\$22	\$6	\$16	0.2	494
ECM 11	Install Low-Flow DHW Devices	491	0.0	0.0	\$70	\$22	\$6	\$16	0.2	494
Food Service & Refrigeration Measures		1,716	0.0	0.0	\$221	\$2,496	\$165	\$2,331	10.5	1,728
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	258	0.0	0.0	\$33	\$303	\$40	\$263	7.9	260
ECM 13	Refrigeration Controls	1,458	0.0	0.0	\$188	\$2,193	\$125	\$2,068	11.0	1,468
Custom Measures		34,954	0.0	111.3	\$5,917	\$9,720	\$0	\$9,720	1.6	48,231
ECM 14	Optimize HVAC Schedule	34,954	0.0	111.3	\$5,917	\$9,720	\$0	\$9,720	1.6	48,231
TOTALS		150,109	19.1	120.3	\$21,472	\$123,688	\$16,101	\$107,587	5.0	165,241

* - 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).

MEMORIAL 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			192	0.0	0	\$27	\$131	\$20	\$111	4.1	188
ECM 1	Retrofit Fixtures with LED Lamps	Yes	192	0.0	0	\$27	\$131	\$20	\$111	4.1	188
Lighting Control Measures			6,788	1.2	-1	\$959	\$7,136	\$4,395	\$2,741	2.9	6,670
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	2,206	0.4	0	\$312	\$1,736	\$230	\$1,506	4.8	2,167
ECM 3	Install High/Low Lighting Controls	Yes	4,582	0.8	-1	\$647	\$5,400	\$4,165	\$1,235	1.9	4,502
Variable Frequency Drive (VFD) Measures			33,393	6.0	13	\$4,929	\$31,114	\$2,550	\$28,564	5.8	35,152
ECM 4	Install VFD on Variable Air Volume (VAV) Fans	Yes	30,589	5.9	0	\$4,389	\$27,606	\$2,475	\$25,131	5.7	30,803
ECM 5	Install VFDs on Kitchen Hood Fan Motors	Yes	2,803	0.0	13	\$540	\$3,508	\$75	\$3,433	6.4	4,349
Unitary HVAC Measures			22,008	24.5	4	\$3,199	\$314,638	\$15,917	\$298,721	93.4	22,625
ECM 6	Install High Efficiency Air Conditioning Units	No	22,008	24.5	4	\$3,199	\$314,638	\$15,917	\$298,721	93.4	22,625
Gas Heating (HVAC/Process) Replacement			0	0.0	19	\$201	\$4,532	\$500	\$4,032	20.1	2,216
ECM 7	Install High Efficiency Furnaces	No	0	0.0	19	\$201	\$4,532	\$500	\$4,032	20.1	2,216
HVAC System Improvements			1,303	0.0	0	\$187	\$298	\$50	\$248	1.3	1,312
ECM 8	Install Pipe Insulation	Yes	1,303	0.0	0	\$187	\$298	\$50	\$248	1.3	1,312
Domestic Water Heating Upgrade			491	0.0	0	\$70	\$22	\$6	\$16	0.2	494
ECM 9	Install Low-Flow DHW Devices	Yes	491	0.0	0	\$70	\$22	\$6	\$16	0.2	494
Custom Measures			17,037	0.0	48	\$2,953	\$4,838	\$0	\$4,838	1.6	22,771
ECM 10	Optimize HVAC Schedule	Yes	17,037	0.0	48	\$2,953	\$4,838	\$0	\$4,838	1.6	22,771
TOTALS (COST EFFECTIVE MEASURES)			59,203	7.2	60	\$9,125	\$43,539	\$7,021	\$36,518	4.0	66,587
TOTALS (ALL MEASURES)			81,211	31.7	82	\$12,525	\$362,709	\$23,438	\$339,272	27.1	91,428

* - 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).

MOUNTAIN 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			347	0.1	0	\$44	\$217	\$30	\$187	4.3	341
ECM 1	Retrofit Fixtures with LED Lamps	Yes	347	0.1	0	\$44	\$217	\$30	\$187	4.3	341
Lighting Control Measures			12,075	2.2	-3	\$1,531	\$8,526	\$4,560	\$3,966	2.6	11,864
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	6,699	1.3	-1	\$849	\$3,126	\$395	\$2,731	3.2	6,582
ECM 3	Install High/Low Lighting Controls	Yes	5,376	1.0	-1	\$681	\$5,400	\$4,165	\$1,235	1.8	5,282
Variable Frequency Drive (VFD) Measures			58,850	9.5	0	\$7,587	\$64,028	\$4,325	\$59,703	7.9	59,261
ECM 4	Install VFDs on Constant Volume (CV) Fans	Yes	40,933	6.6	0	\$5,277	\$45,673	\$1,925	\$43,748	8.3	41,219
ECM 5	Install VFDs on Heating Water Pumps	Yes	17,917	3.0	0	\$2,310	\$18,354	\$2,400	\$15,954	6.9	18,042
Unitary HVAC Measures			11,496	5.7	6	\$1,546	\$96,040	\$3,843	\$92,197	59.7	12,296
ECM 6	Install High Efficiency Air Conditioning Units	No	11,496	5.7	6	\$1,546	\$96,040	\$3,843	\$92,197	59.7	12,296
Food Service & Refrigeration Measures			1,716	0.0	0	\$221	\$2,496	\$165	\$2,331	10.5	1,728
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	258	0.0	0	\$33	\$303	\$40	\$263	7.9	260
ECM 8	Refrigeration Controls	Yes	1,458	0.0	0	\$188	\$2,193	\$125	\$2,068	11.0	1,468
Custom Measures			17,918	0.0	63	\$2,964	\$4,882	\$0	\$4,882	1.6	25,459
ECM 9	Optimize HVAC Schedule	Yes	17,918	0.0	63	\$2,964	\$4,882	\$0	\$4,882	1.6	25,459
TOTALS (COST EFFECTIVE MEASURES)			90,906	11.9	61	\$12,347	\$80,149	\$9,080	\$71,069	5.8	98,654
TOTALS (ALL MEASURES)			102,402	17.6	67	\$13,892	\$176,188	\$12,923	\$163,266	11.8	110,950

* - 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

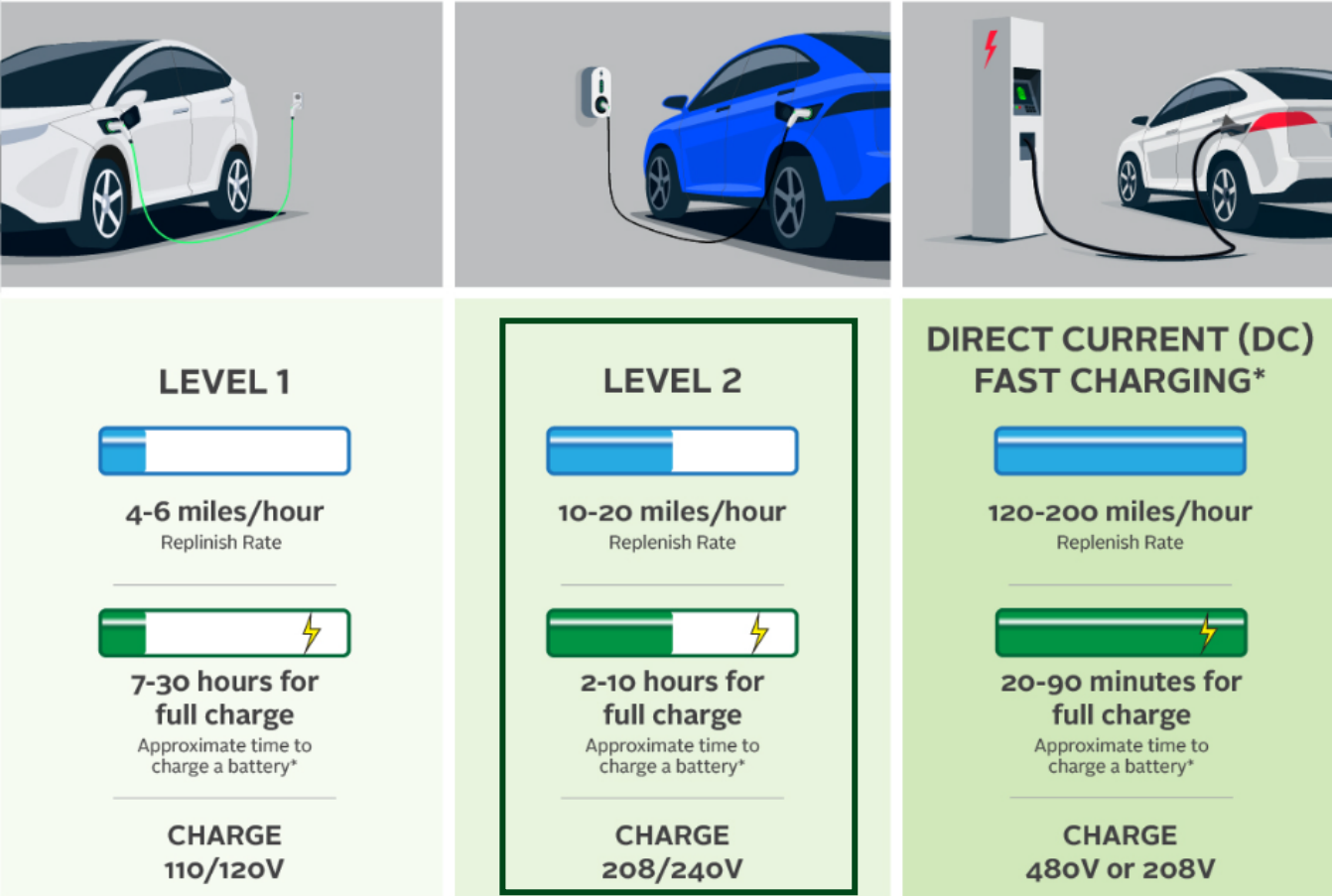
MEASURES FOR FUTURE CONSIDERATION

- Retro-Commissioning Study

EV CHARGING STATION POTENTIAL

NJCleanEnergy.com/EV

Know your EV Charging Stations



*dependent on the size of the battery

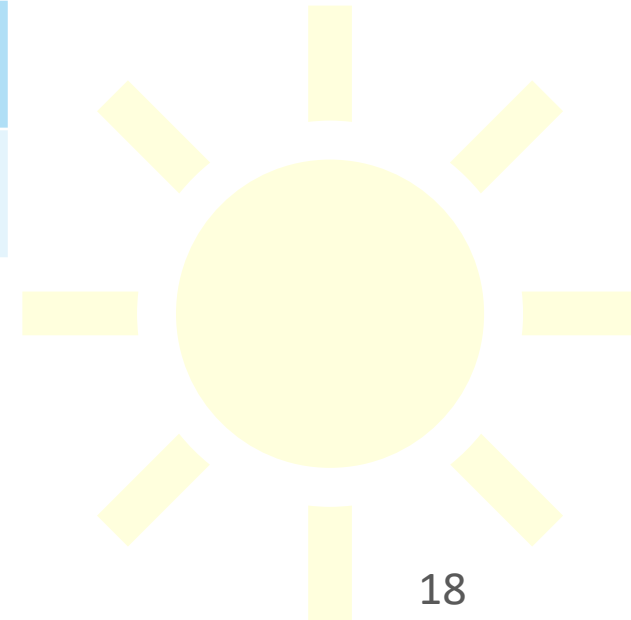
	Memorial Elementary School	High Mountain School
Potential:	Medium	Medium



SOLAR ENERGY GENERATION POTENTIAL

NJCleanEnergy.com/renewable-energy

	Memorial ES	High Mountain
<i>Potential:</i>	HIGH	HIGH
<i>System Potential: (kW)</i>	141	199
<i>Electric Generation: (kWh per year)</i>	167,983	237,083
<i>Displaced Cost: (per year)</i>	\$24,100	\$30,560

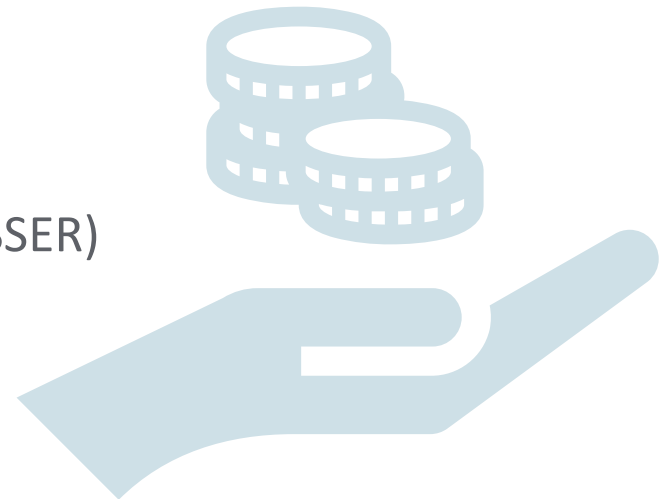


FINANCING MECHANISM: ESIP

NJCleanEnergy.com/ESIP

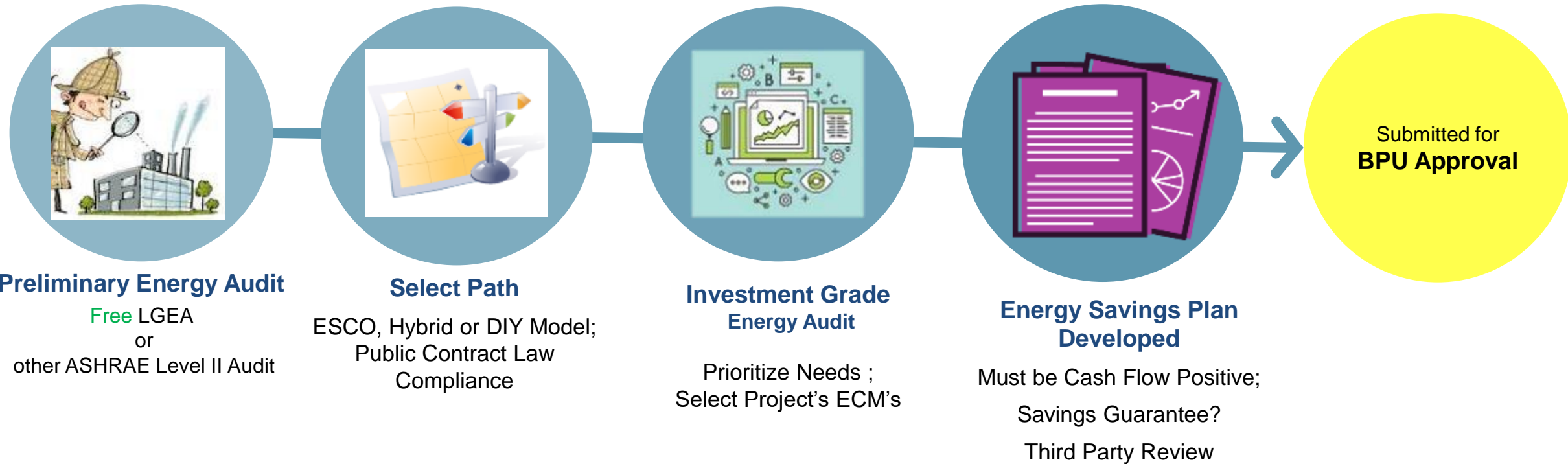
ENERGY SAVINGS IMPROVEMENT PROGRAM (ESIP)

- Energy Performance Contracting = NJ ESIP
- 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
- 15 or 20 year pay back; self funding
- NJBPU Approved Incentive Programs
 - Utility or NJCEP
- Can be combined with Federal/State Pandemic Relief Funds (ESSER)
- 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

FOR MORE INFORMATION

Michelle Rossi

ESIP Coordinator

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C&I ENERGY EFFICIENCY PROGRAMS

NJCleanEnergy.com

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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Wolff Saint-Fleur – LGEA Energy Auditor

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(732) 404-7882

THANK YOU

