

LGEA Presentation Princeton Charter School

September 22, 2023

New Jersey's
Clean Energy Program

Lighting the way to New Jersey's Clean Energy Future



INTRODUCTIONS

- *Princeton Charter School*
 - Larry Patton – Head of School
 - Patrick Byrne – Facilities Manager
 - John Weihe – Former Board of Trustees Member
- *NJ Clean Energy Program*
 - Sarah Walters – LGEA Project Manager
 - Juno Romanick – LGEA Project Auditor
 - Meredith Coley – LGEA Account Manager

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 Princeton Charter School

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:

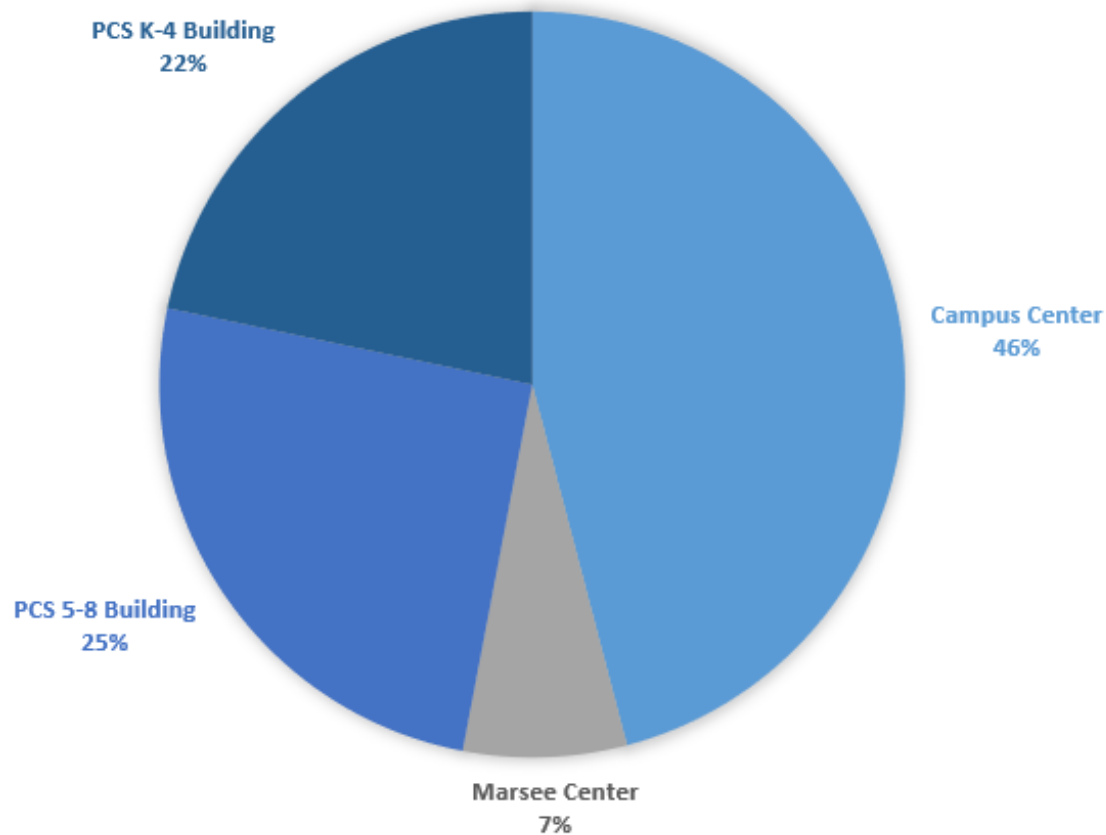
- Electric Consumption and Costs
- Natural Gas Consumption and Costs
- Fuel Oil Consumption and Costs

Sites Visited/Analyzed

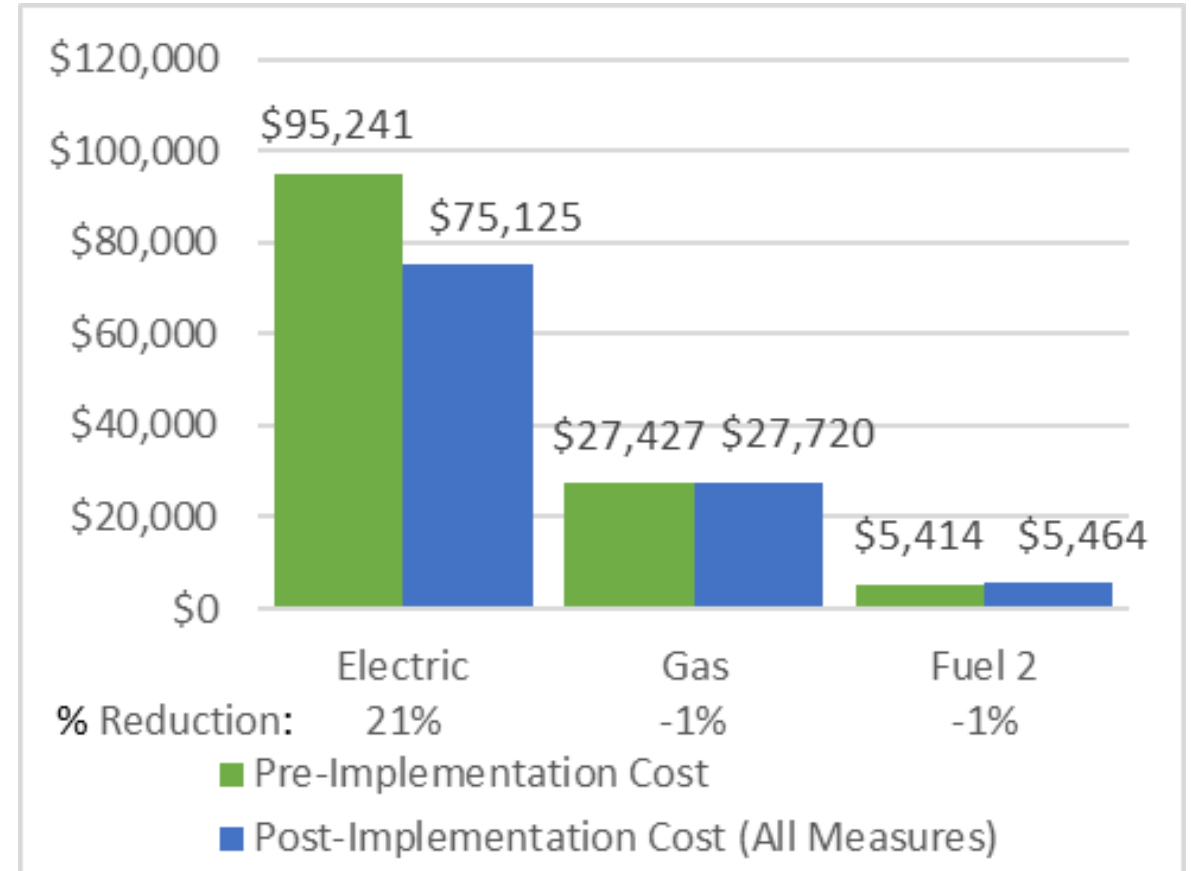
- Princeton Charter School K – 4 Building
- Princeton Charter School 5 – 8 Building
- Campus Center
- Marsee Center

UTILITY BREAKOUT

Percent of Total Annual Energy Costs



Pre & Post Implementation Cost



Site EUI
61.2 kBtu/ft²

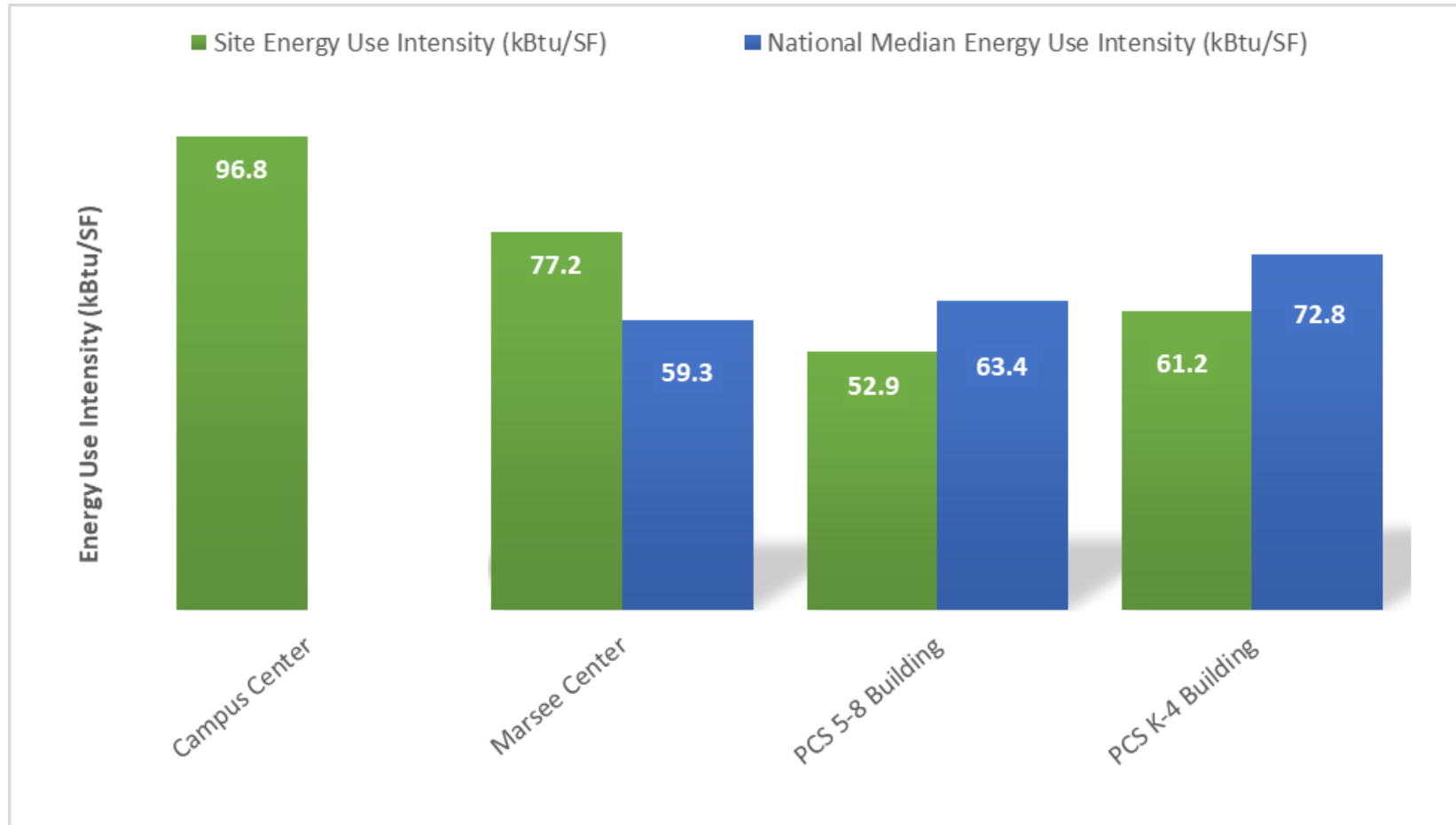
Source EUI
104.4 kBtu/ft²

Site Name	ENERGY STAR® Score
Princeton Charter School K – 4 Building	66
Princeton Charter School 5 – 8 Building	66
Campus Center	N/A
Marsee Center	29

National Median Comparison	
National Median Site EUI (kBtu/ft ²)	72.8
National Median Source EUI (kBtu/ft ²)	124
% Diff from National Median Source EUI	-16%

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.

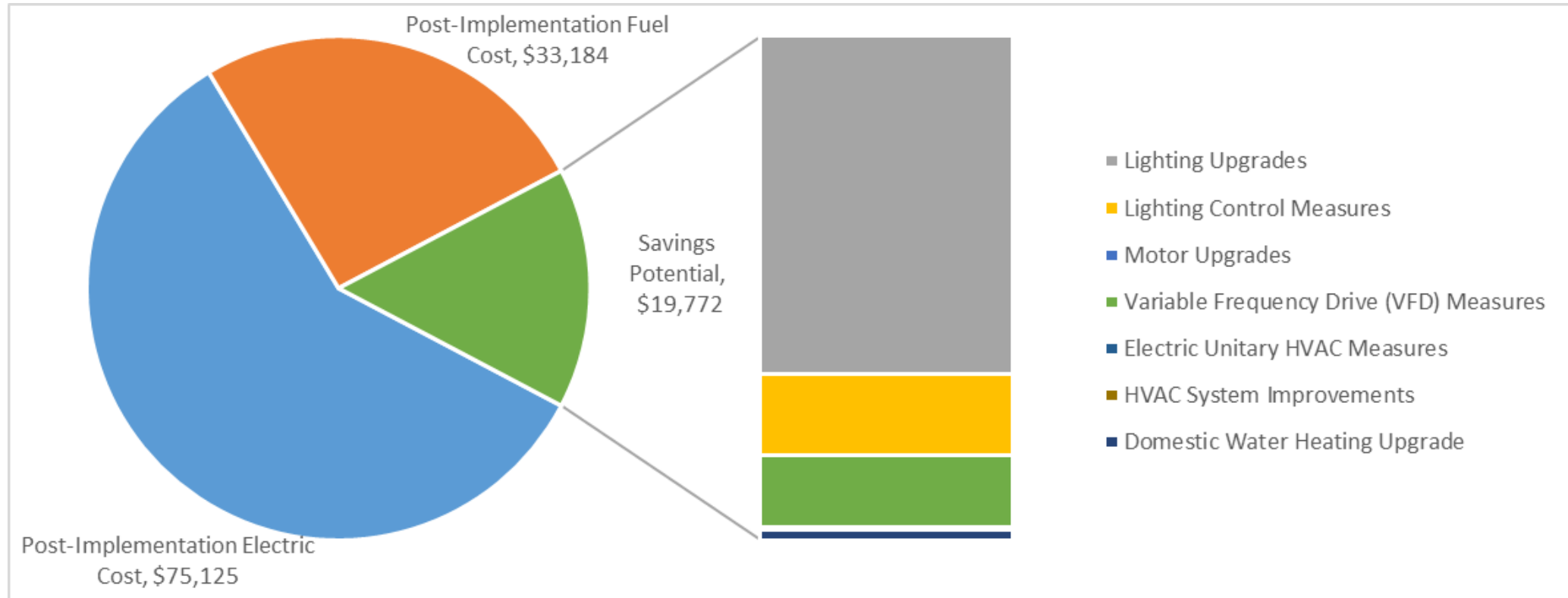
BENCHMARKING



Campus Center is a unique building resulting in a N/A ENERGY STAR score. There is no National Median EUI to compare.

ALL OPPORTUNITIES

Savings Potential



ALL OPPORTUNITIES

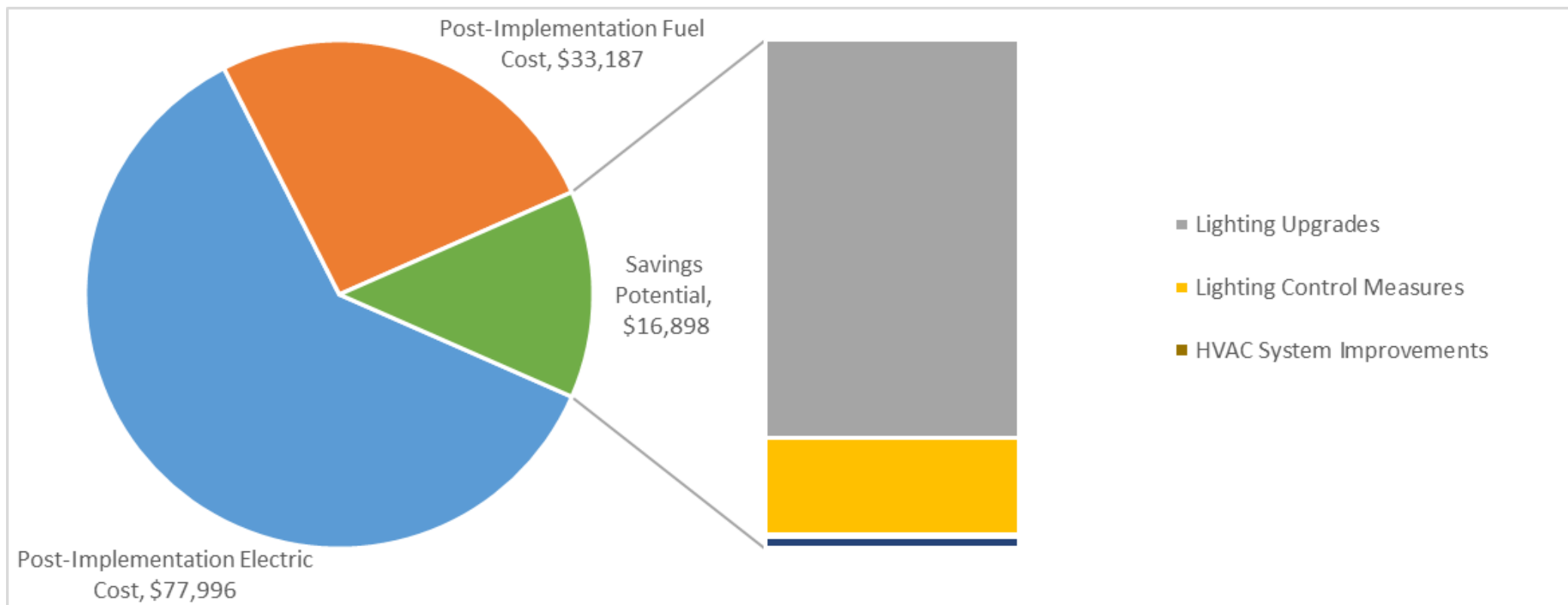
#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		92,991	23.4	-18.2	\$13,236	\$36,391	\$7,543	\$28,848	2.2	91,427
ECM 1	Install LED Fixtures	7,380	0.0	0.0	\$1,054	\$3,833	\$550	\$3,283	3.1	7,432
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	142	0.1	0.0	\$20	\$257	\$40	\$217	10.8	139
ECM 3	Retrofit Fixtures with LED Lamps	84,390	23.2	-18.0	\$11,992	\$31,287	\$6,953	\$24,334	2.0	82,795
ECM 4	Install LED Exit Signs	1,079	0.1	-0.2	\$169	\$1,014	\$0	\$1,014	6.0	1,060
Lighting Control Measures		22,110	6.1	-4.8	\$3,179	\$34,008	\$9,435	\$24,573	7.7	21,678
ECM 5	Install Occupancy Sensor Lighting Controls	18,900	5.3	-4.2	\$2,720	\$25,458	\$3,450	\$22,008	8.1	18,523
ECM 6	Install High/Low Lighting Controls	3,211	0.8	-0.7	\$460	\$8,550	\$5,985	\$2,565	5.6	3,154
Motor Upgrades		318	0.2	0.0	\$46	\$2,416	\$0	\$2,416	52.5	320
ECM 7	Premium Efficiency Motors	318	0.2	0.0	\$46	\$2,416	\$0	\$2,416	52.5	320
Variable Frequency Drive (VFD) Measures		20,187	5.9	0.0	\$2,798	\$69,799	\$2,500	\$67,299	24.0	20,328
ECM 8	Install VFDs on Chilled Water Pumps	18,903	5.7	0.0	\$2,593	\$62,891	\$2,400	\$60,491	23.3	19,035
ECM 9	Install VFDs on Heating Water Pumps	1,283	0.2	0.0	\$205	\$6,908	\$100	\$6,808	33.2	1,292
Unitary HVAC Measures		188	0.1	0.0	\$30	\$791	\$0	\$791	26.4	189
ECM 10	Install High Efficiency Air Conditioning Units	188	0.1	0.0	\$30	\$791	\$0	\$791	26.4	189
HVAC System Improvements		657	0.0	0.0	\$101	\$191	\$32	\$159	1.6	661
ECM 11	Install Pipe Insulation	657	0.0	0.0	\$101	\$191	\$32	\$159	1.6	661
Domestic Water Heating Upgrade		2,347	0.0	0.9	\$382	\$287	\$109	\$178	0.5	2,501
ECM 12	Install Low-Flow DHW Devices	2,347	0.0	0.9	\$382	\$287	\$109	\$178	0.5	2,501
TOTALS		138,797	35.6	-22.2	\$19,772	\$143,883	\$19,619	\$124,264	6.3	137,104

* - 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		92,991	23.4	-18.2	\$13,236	\$36,391	\$7,543	\$28,848	2.2	91,427
ECM 1	Install LED Fixtures	7,380	0.0	0.0	\$1,054	\$3,833	\$550	\$3,283	3.1	7,432
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	142	0.1	0.0	\$20	\$257	\$40	\$217	10.8	139
ECM 3	Retrofit Fixtures with LED Lamps	84,390	23.2	-18.0	\$11,992	\$31,287	\$6,953	\$24,334	2.0	82,795
ECM 4	Install LED Exit Signs	1,079	0.1	-0.2	\$169	\$1,014	\$0	\$1,014	6.0	1,060
Lighting Control Measures		22,110	6.1	-4.8	\$3,179	\$34,008	\$9,435	\$24,573	7.7	21,678
ECM 5	Install Occupancy Sensor Lighting Controls	18,900	5.3	-4.2	\$2,720	\$25,458	\$3,450	\$22,008	8.1	18,523
ECM 6	Install High/Low Lighting Controls	3,211	0.8	-0.7	\$460	\$8,550	\$5,985	\$2,565	5.6	3,154
HVAC System Improvements		657	0.0	0.0	\$101	\$191	\$32	\$159	1.6	661
ECM 11	Install Pipe Insulation	657	0.0	0.0	\$101	\$191	\$32	\$159	1.6	661
Domestic Water Heating Upgrade		2,347	0.0	0.9	\$382	\$287	\$109	\$178	0.5	2,501
ECM 12	Install Low-Flow DHW Devices	2,347	0.0	0.9	\$382	\$287	\$109	\$178	0.5	2,501
TOTALS		118,105	29.5	-22.2	\$16,898	\$70,877	\$17,119	\$53,758	3.2	116,267

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PRINCETON CHARTER SCHOOL K – 4 BLDG

#	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			20,137	4.1	-4	\$2,862	\$7,320	\$1,749	\$5,571	1.9	19,837
ECM 1	Install LED Fixtures	Yes	2,155	0.0	0	\$312	\$663	\$200	\$463	1.5	2,170
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	142	0.1	0	\$20	\$257	\$40	\$217	10.8	139
ECM 3	Retrofit Fixtures with LED Lamps	Yes	17,840	4.0	-4	\$2,530	\$6,401	\$1,509	\$4,892	1.9	17,528
Lighting Control Measures			6,405	1.4	-1	\$908	\$8,692	\$2,420	\$6,272	6.9	6,293
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	5,499	1.2	-1	\$780	\$6,442	\$845	\$5,597	7.2	5,403
ECM 5	Install High/Low Lighting Controls	Yes	905	0.2	0	\$128	\$2,250	\$1,575	\$675	5.3	890
Motor Upgrades			318	0.2	0	\$46	\$2,416	\$0	\$2,416	52.5	320
ECM 6	Premium Efficiency Motors	No	318	0.2	0	\$46	\$2,416	\$0	\$2,416	52.5	320
HVAC System Improvements			246	0.0	0	\$36	\$72	\$12	\$60	1.7	248
ECM 7	Install Pipe Insulation	Yes	246	0.0	0	\$36	\$72	\$12	\$60	1.7	248
Domestic Water Heating Upgrade			1,218	0.0	0	\$176	\$93	\$43	\$50	0.3	1,227
ECM 8	Install Low-Flow DHW Devices	Yes	1,218	0.0	0	\$176	\$93	\$43	\$50	0.3	1,227
TOTALS (COST EFFECTIVE MEASURES)			28,006	5.6	-5	\$3,982	\$16,177	\$4,224	\$11,953	3.0	27,605
TOTALS (ALL MEASURES)			28,324	5.7	-5	\$4,028	\$18,593	\$4,224	\$14,368	3.6	27,925

* - 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).

PRINCETON CHARTER SCHOOL 5 – 8 BLDG

#	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			26,165	7.9	-5	\$4,112	\$13,890	\$3,299	\$10,591	2.6	25,783
ECM 1	Install LED Fixtures	Yes	626	0.0	0	\$100	\$346	\$50	\$296	3.0	631
ECM 2	Retrofit Fixtures with LED Lamps	Yes	24,460	7.8	-5	\$3,842	\$12,530	\$3,249	\$9,281	2.4	24,092
ECM 3	Install LED Exit Signs	Yes	1,079	0.1	0	\$169	\$1,014	\$0	\$1,014	6.0	1,060
Lighting Control Measures			7,573	2.6	-2	\$1,187	\$13,566	\$3,305	\$10,261	8.6	7,441
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	6,614	2.4	-1	\$1,037	\$10,416	\$1,380	\$9,036	8.7	6,498
ECM 5	Install High/Low Lighting Controls	Yes	959	0.3	0	\$150	\$3,150	\$1,925	\$1,225	8.1	942
Variable Frequency Drive (VFD) Measures			1,283	0.2	0	\$205	\$6,908	\$100	\$6,808	33.2	1,292
ECM 6	Install VFDs on Heating Water Pumps	No	1,283	0.2	0	\$205	\$6,908	\$100	\$6,808	33.2	1,292
Unitary HVAC Measures			188	0.1	0	\$30	\$791	\$0	\$791	26.4	189
ECM 7	Install High Efficiency Air Conditioning Units	No	188	0.1	0	\$30	\$791	\$0	\$791	26.4	189
HVAC System Improvements			410	0.0	0	\$66	\$119	\$20	\$99	1.5	413
ECM 8	Install Pipe Insulation	Yes	410	0.0	0	\$66	\$119	\$20	\$99	1.5	413
Domestic Water Heating Upgrade			1,128	0.0	0	\$180	\$158	\$54	\$104	0.6	1,136
ECM 9	Install Low-Flow DHW Devices	Yes	1,128	0.0	0	\$180	\$158	\$54	\$104	0.6	1,136
TOTALS (COST EFFECTIVE MEASURES)			35,277	10.5	-6	\$5,545	\$27,733	\$6,678	\$21,055	3.8	34,773
TOTALS (ALL MEASURES)			36,748	10.9	-6	\$5,780	\$35,432	\$6,778	\$28,654	5.0	36,255

* - 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).

CAMPUS CENTER

#	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			38,021	9.7	-8	\$5,109	\$10,404	\$1,717	\$8,687	1.7	37,356
ECM 1	Retrofit Fixtures with LED Lamps	Yes	38,021	9.7	-8	\$5,109	\$10,404	\$1,717	\$8,687	1.7	37,356
Lighting Control Measures			7,087	1.7	-1	\$952	\$9,320	\$3,395	\$5,925	6.2	6,963
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	5,740	1.3	-1	\$771	\$6,170	\$910	\$5,260	6.8	5,640
ECM 3	Install High/Low Lighting Controls	Yes	1,346	0.3	0	\$181	\$3,150	\$2,485	\$665	3.7	1,323
Variable Frequency Drive (VFD) Measures			18,903	5.7	0	\$2,593	\$62,891	\$2,400	\$60,491	23.3	19,035
ECM 4	Install VFDs on Chilled Water Pumps	No	18,903	5.7	0	\$2,593	\$62,891	\$2,400	\$60,491	23.3	19,035
Domestic Water Heating Upgrade			0	0.0	0	\$4	\$14	\$4	\$10	2.8	33
ECM 5	Install Low-Flow DHW Devices	Yes	0	0.0	0	\$4	\$14	\$4	\$10	2.8	33
TOTALS (COST EFFECTIVE MEASURES)			45,107	11.3	-9	\$6,065	\$19,738	\$5,116	\$14,622	2.4	44,351
TOTALS (ALL MEASURES)			64,010	17.0	-9	\$8,658	\$82,629	\$7,516	\$75,113	8.7	63,386

* - 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).

MARSEE CENTER

#	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			8,669	1.6	-2	\$1,153	\$4,777	\$778	\$3,999	3.5	8,451
ECM 1	Install LED Fixtures	Yes	4,599	0.0	0	\$642	\$2,824	\$300	\$2,524	3.9	4,631
ECM 2	Retrofit Fixtures with LED Lamps	Yes	4,070	1.6	-2	\$511	\$1,953	\$478	\$1,475	2.9	3,820
Lighting Control Measures			1,046	0.4	0	\$131	\$2,430	\$315	\$2,115	16.1	982
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	1,046	0.4	0	\$131	\$2,430	\$315	\$2,115	16.1	982
Domestic Water Heating Upgrade			0	0.0	1	\$21	\$22	\$8	\$14	0.6	105
ECM 4	Install Low-Flow DHW Devices	Yes	0	0.0	1	\$21	\$22	\$8	\$14	0.6	105
TOTALS (COST EFFECTIVE MEASURES)			9,715	2.0	-1	\$1,306	\$7,229	\$1,101	\$6,128	4.7	9,538
TOTALS (ALL MEASURES)			9,715	2.0	-1	\$1,306	\$7,229	\$1,101	\$6,128	4.7	9,538

* - 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

EV CHARGING STATION POTENTIAL

NJCleanEnergy.com/EV

Know your EV Charging Stations



LEVEL 1



4-6 miles/hour
Replenish Rate



7-30 hours for
full charge

Approximate time to
charge a battery*

CHARGE
110/120V

LEVEL 2



10-20 miles/hour
Replenish Rate



2-10 hours for
full charge

Approximate time to
charge a battery*

CHARGE
208/240V

DIRECT CURRENT (DC) FAST CHARGING*



120-200 miles/hour
Replenish Rate



20-90 minutes for
full charge

Approximate time to
charge a battery*

CHARGE
480V or 208V

*dependent on the size of the battery

Princeton Charter School

Potential:

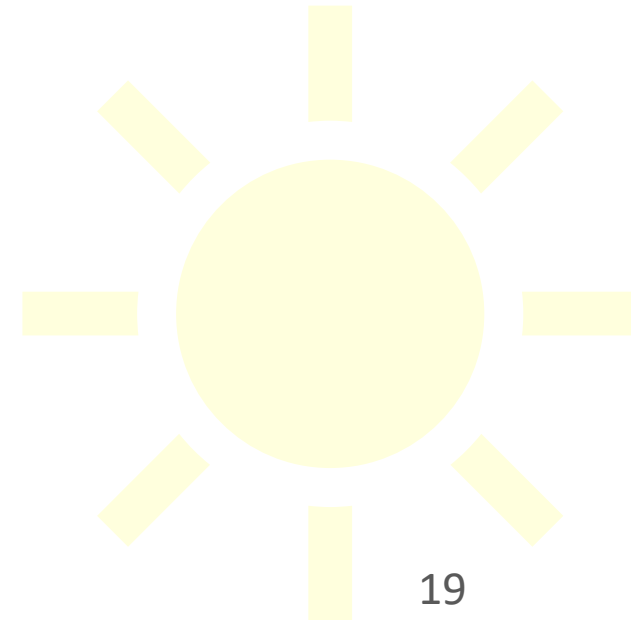
Medium/High



SOLAR ENERGY GENERATION POTENTIAL

NJCleanEnergy.com/renewable-energy

	Campus Center
<i>Potential:</i>	HIGH
<i>System Potential: (kW)</i>	73
<i>Electric Generation: (kWh per year)</i>	86,970
<i>Displaced Cost: (per year)</i>	\$11,930



FINANCING MECHANISM: ESIP

NJCleanEnergy.com/ESIP

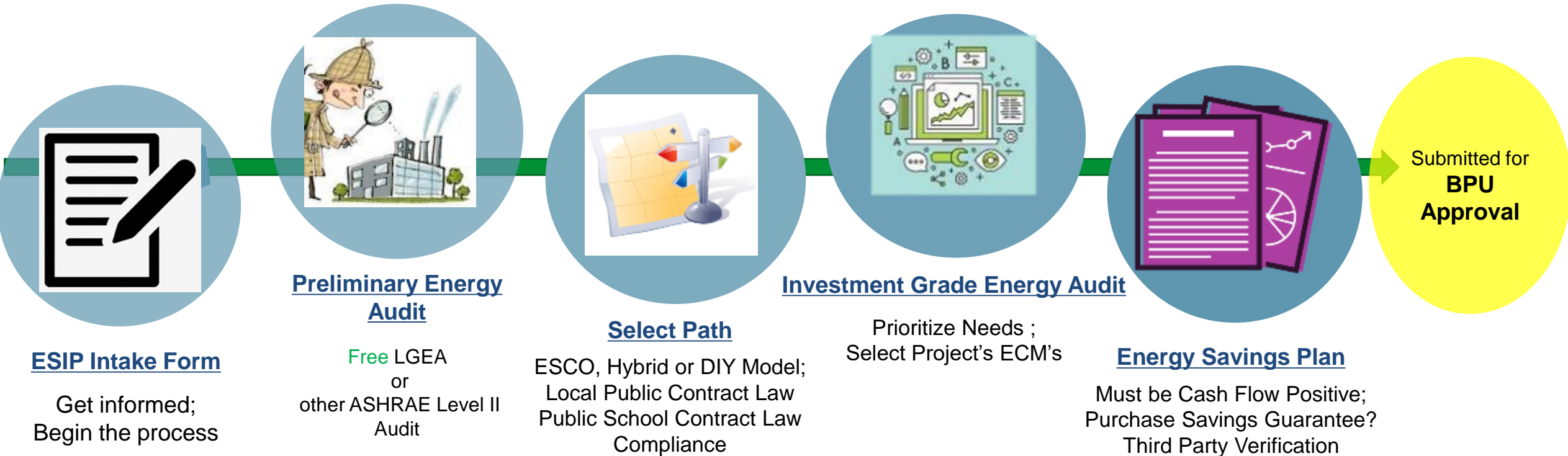
ENERGY SAVINGS IMPROVEMENT PROGRAM (ESIP)

- 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

FOR MORE INFORMATION

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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

ENERGY MANAGEMENT :

- 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

PSE&G

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THANK YOU

