

LGEA Presentation Township of Hillsborough

April 25, 2022



New Jersey's
Clean Energy Program

Lighting the way to New Jersey's Clean Energy Future

INTRODUCTIONS

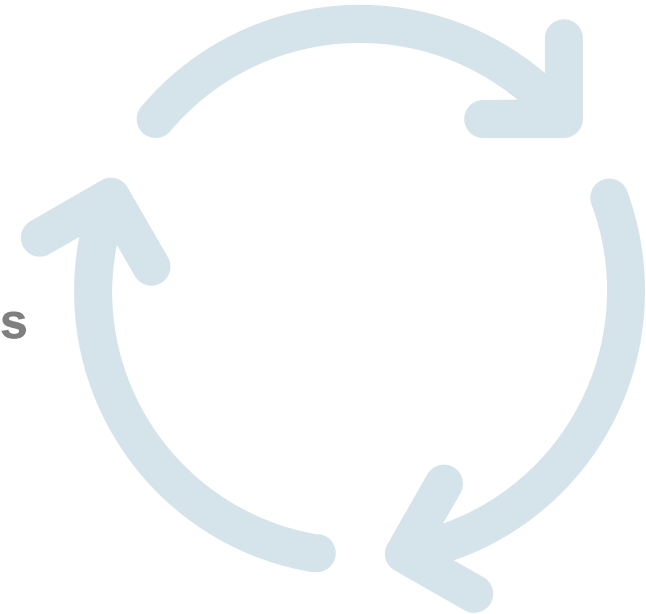
- *Township of Hillsborough*
 - Nancy Costa - CFO
 - David Kois – Business Advocate
- *NJ Clean Energy Program*
 - Sarah Walters – LGEA Project Manager
 - Moussa Traore – LGEA Lead Auditor
 - Ryan Knippenberg – LGEA Project Auditor
 - Meredith Coley – LGEA Account Manager

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)
- C&I Transition of EE Programs
- Questions regarding the draft audit report
- Next steps for Township of Hillsborough

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
- Building Management System

Utility Consumption:

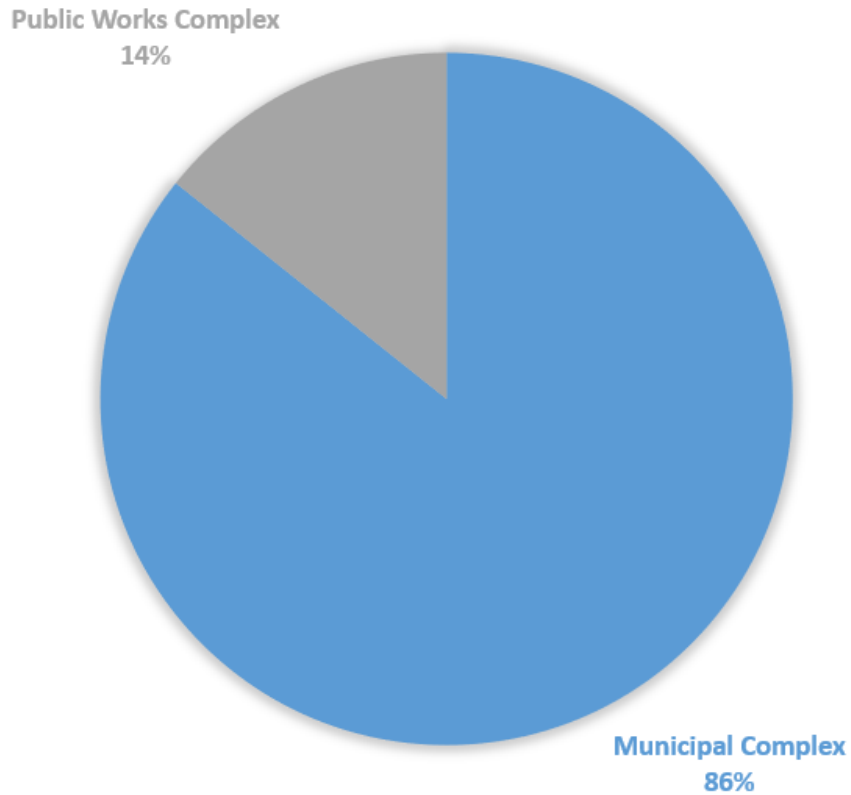
- Electric Consumption and Costs
- Natural Gas Consumption and Costs
- Solar Consumption and Costs

Sites Visited/Analyzed

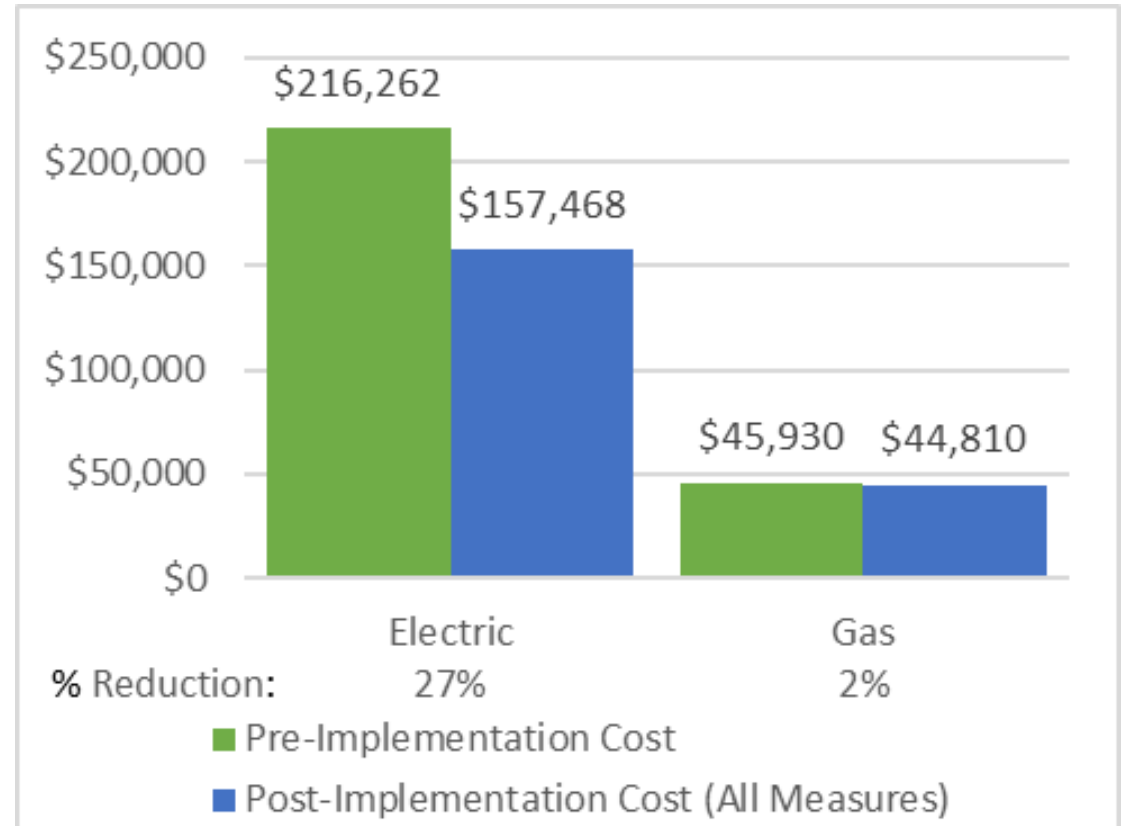
- Municipal Complex
- Public Works Mechanic Shop
- Public Works Truck Garage
- Public Works Main Office
- Public Works Open Building
- Public Works Lean To
- Open Building & Equipment/Vehicle Parking
- Public Works OEM Garage & Rear Powered Gate
- Public Works Salt Building
- Public Works Salt Dome

UTILITY BREAKOUT

Percent of Total Annual Energy Costs



Pre & Post Implementation Cost



BENCHMARKING

ENERGY STAR® Statement of Energy Performance

61
ENERGY STAR® Score¹

Hillsborough Township Municipal Complex

Primary Property Type: Office
Gross Floor Area (ft²): 86,109
Built: 1991

For Year Ending: December 31, 2019
Date Generated: February 25, 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	Property Owner	Primary Contact
Hillsborough Township Municipal Complex 379 South Branch Road Hillsborough, New Jersey 08844	Township of Hillsborough 379 South Branch Road Hillsborough, NJ 08844 (908) 369-8672	Nancy Costa 379 South Branch Road Hillsborough, NJ 08844 (908) 369-8672 ncosta@hillsborough-nj.org

Property ID: 18236214

Energy Consumption and Energy Use Intensity (EUI)

Site EUI	Annual Energy by Fuel	National Median Comparison
85.3 kBtu/ft ²	Electric - Grid (kBtu) 3,554,382 (48%)	National Median Site EUI (kBtu/ft ²) 98.9
	Natural Gas (kBtu) 2,740,596 (37%)	National Median Source EUI (kBtu/ft ²) 186.9
	Electric - Solar (kBtu) 1,050,029 (14%)	% Diff from National Median Source EUI -14%
Source EUI 161.2 kBtu/ft ²		Annual Emissions Greenhouse Gas Emissions (Metric Tons CO ₂ e/year) 573

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 EUI
85.3 kBtu/ft²

Source EUI
161.2 kBtu/ft²

National Median Comparison

National Median Site EUI (kBtu/ft²) 98.9

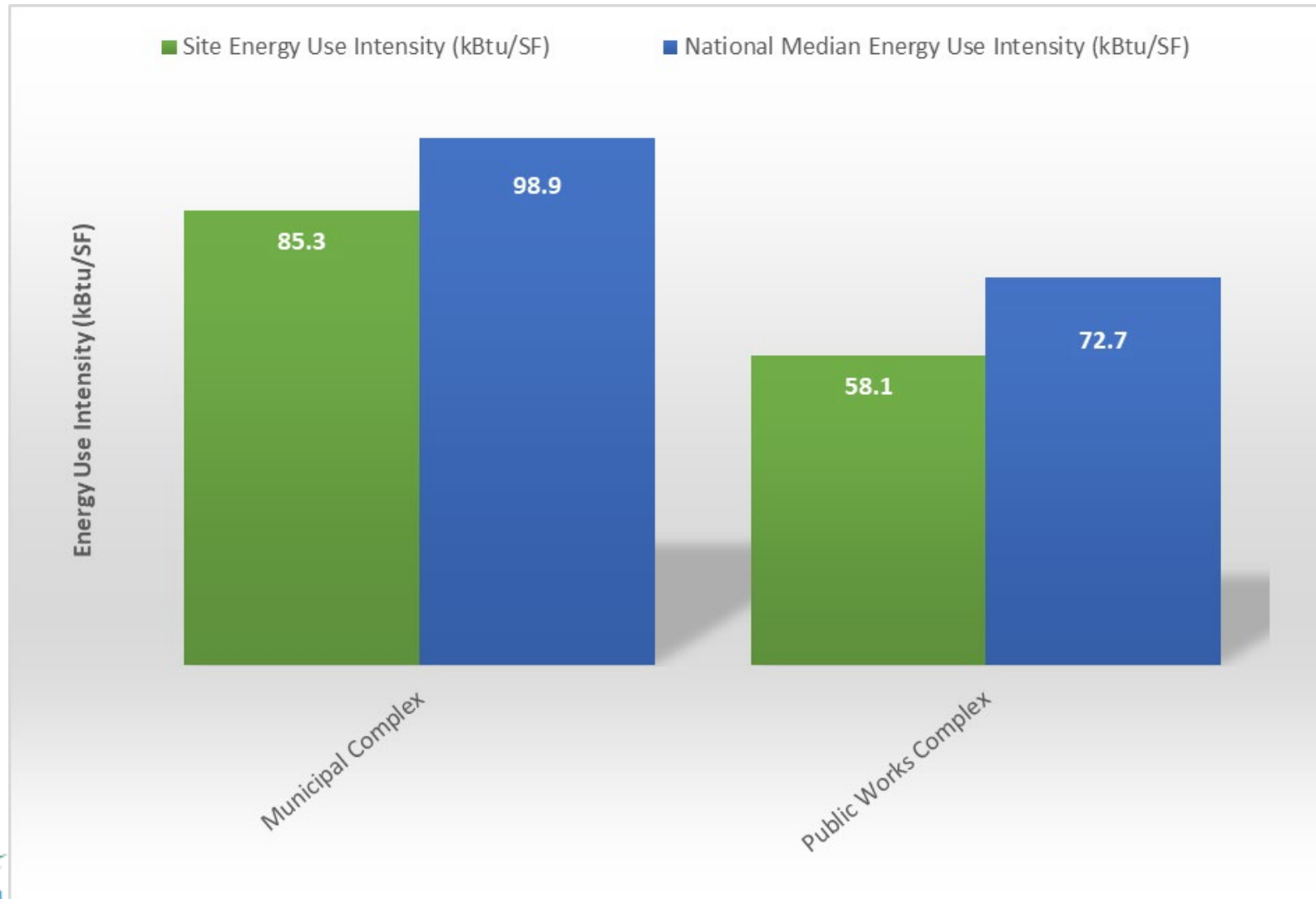
National Median Source EUI (kBtu/ft²) 186.9

% Diff from National Median Source EUI -14%

Site Name	ENERGY STAR® Score
Municipal Complex	61
Public Works Complex	N/A

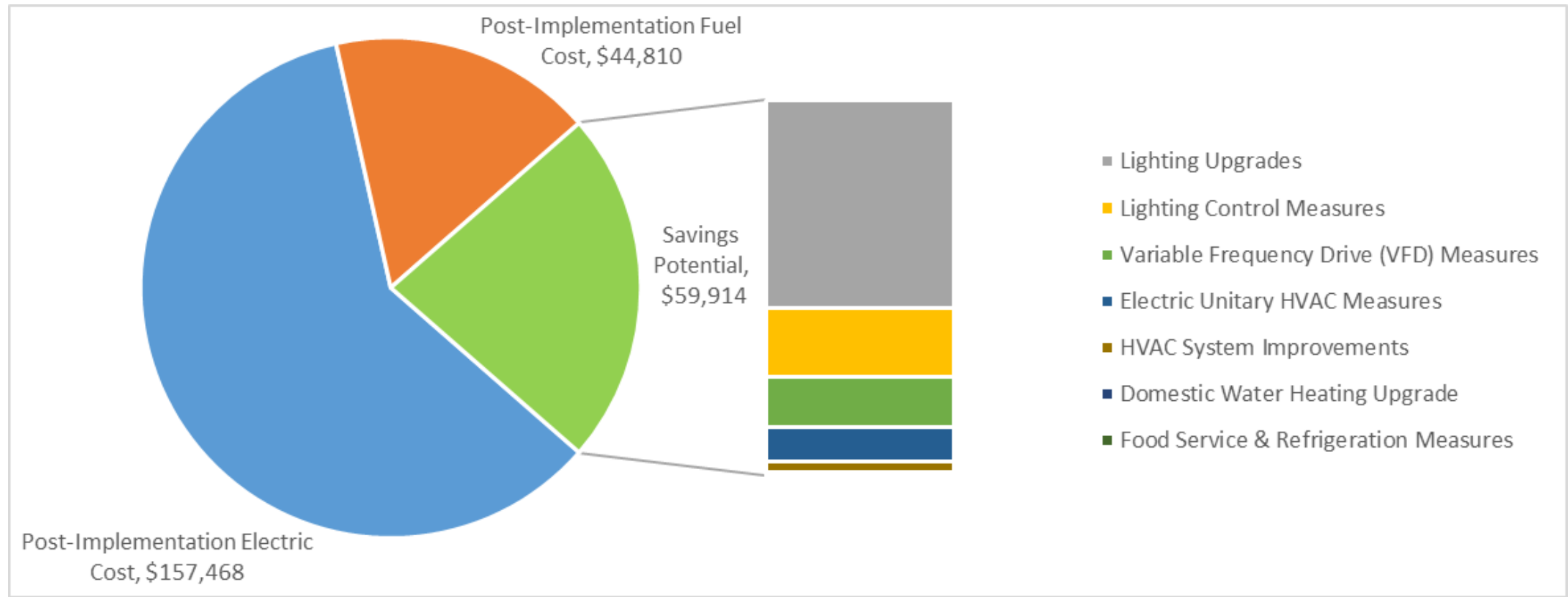
ENERGY STAR® scores are percentile ranking from 1 (least efficient) to 100 (most efficient). It compares your building's energy performance to similar buildings nationwide.

BENCHMARKING



ALL OPPORTUNITIES

Savings Potential



ALL OPPORTUNITIES

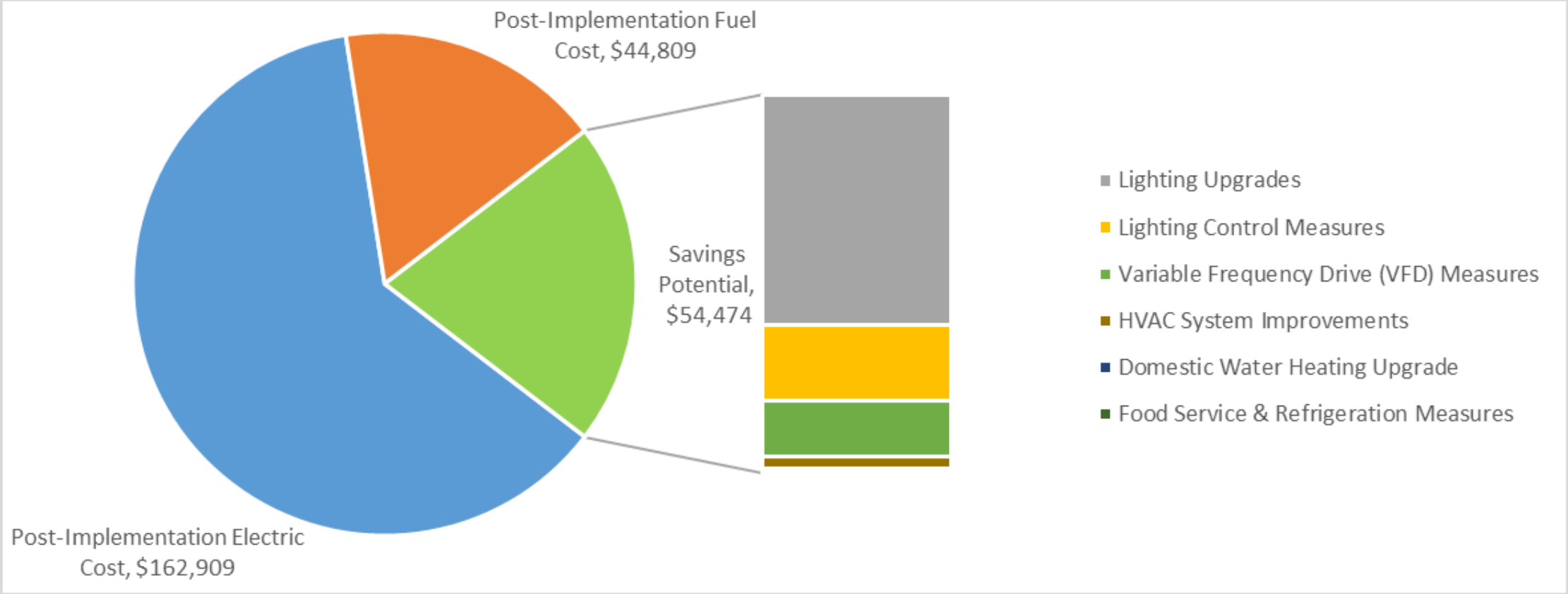
#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated M&L Cost (\$)	Estimated Incentive (\$)*	Estimated Net M&L Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		223,748	48.3	-46.2	\$33,278	\$94,524	\$24,295	\$70,229	2.1	219,898
ECM 1	Install LED Fixtures	6,520	1.8	-0.5	\$1,035	\$5,071	\$650	\$4,421	4.3	6,512
ECM 2	Retrofit Fixtures with LED Lamps	217,228	46.5	-45.8	\$32,243	\$89,453	\$23,645	\$65,808	2.0	213,385
Lighting Control Measures		73,326	15.9	-15.6	\$10,846	\$60,356	\$11,175	\$49,181	4.5	72,010
ECM 3	Install Occupancy Sensor Lighting Controls	64,896	14.8	-13.8	\$9,606	\$52,706	\$6,660	\$46,046	4.8	63,732
ECM 4	Install High/Low Lighting Controls	8,430	1.1	-1.8	\$1,241	\$7,650	\$4,515	\$3,135	2.5	8,278
Variable Frequency Drive (VFD) Measures		54,127	13.0	0.0	\$8,048	\$61,090	\$3,700	\$57,390	7.1	54,505
ECM 5	Install VFD on Variable Air Volume (VAV) Fans	3,413	0.9	0.0	\$508	\$3,884	\$200	\$3,684	7.3	3,437
ECM 6	Install VFDs on Constant Volume (CV) Fans	46,866	11.8	0.0	\$6,968	\$50,684	\$3,300	\$47,384	6.8	47,194
ECM 7	Install VFDs on Heating Water Pumps	3,847	0.4	0.0	\$572	\$6,522	\$200	\$6,322	11.1	3,874
Electric Unitary HVAC Measures		36,590	23.0	0.0	\$5,440	\$150,593	\$4,934	\$145,660	26.8	36,846
ECM 8	Install High Efficiency Air Conditioning Units	1,010	0.6	0.0	\$150	\$6,246	\$0	\$6,246	41.6	1,017
ECM 9	Install High Efficiency Heat Pumps	35,580	22.4	0.0	\$5,290	\$144,347	\$4,934	\$139,413	26.4	35,829
HVAC System Improvements		0	0.0	173.9	\$1,685	\$2,211	\$385	\$1,826	1.1	20,362
ECM 10	Install Programmable Thermostats	0	0.0	46.9	\$454	\$990	\$0	\$990	2.2	5,490
ECM 11	Install Occupancy-Controlled Thermostats	0	0.0	124.8	\$1,210	\$1,193	\$375	\$818	0.7	14,615
ECM 12	Install Pipe Insulation	0	0.0	2.2	\$21	\$29	\$10	\$19	0.9	257
Domestic Water Heating Upgrade		25	0.0	5.1	\$52	\$257	\$54	\$204	3.9	617
ECM 13	Install Low-Flow DHW Devices	25	0.0	5.1	\$52	\$257	\$54	\$204	3.9	617
Food Service & Refrigeration Measures		3,566	0.4	0.0	\$565	\$690	\$100	\$590	1.0	3,591
ECM 14	Vending Machine Control	3,566	0.4	0.0	\$565	\$690	\$100	\$590	1.0	3,591
TOTALS		391,381	100.7	117.1	\$59,914	\$369,722	\$44,642	\$325,080	5.4	407,829

* - 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		223,748	48.3	-46.2	\$33,278	\$94,524	\$24,295	\$70,229	2.1	219,898
ECM 1	Install LED Fixtures	6,520	1.8	-0.5	\$1,035	\$5,071	\$650	\$4,421	4.3	6,512
ECM 2	Retrofit Fixtures with LED Lamps	217,228	46.5	-45.8	\$32,243	\$89,453	\$23,645	\$65,808	2.0	213,385
Lighting Control Measures		73,326	15.9	-15.6	\$10,846	\$60,356	\$11,175	\$49,181	4.5	72,010
ECM 3	Install Occupancy Sensor Lighting Controls	64,896	14.8	-13.8	\$9,606	\$52,706	\$6,660	\$46,046	4.8	63,732
ECM 4	Install High/Low Lighting Controls	8,430	1.1	-1.8	\$1,241	\$7,650	\$4,515	\$3,135	2.5	8,278
Variable Frequency Drive (VFD) Measures		54,127	13.0	0.0	\$8,048	\$61,090	\$3,700	\$57,390	7.1	54,505
ECM 5	Install VFD on Variable Air Volume (VAV) Fans	3,413	0.9	0.0	\$508	\$3,884	\$200	\$3,684	7.3	3,437
ECM 6	Install VFDs on Constant Volume (CV) Fans	46,866	11.8	0.0	\$6,968	\$50,684	\$3,300	\$47,384	6.8	47,194
ECM 7	Install VFDs on Heating Water Pumps	3,847	0.4	0.0	\$572	\$6,522	\$200	\$6,322	11.1	3,874
HVAC System Improvements		0	0.0	173.9	\$1,685	\$2,211	\$385	\$1,826	1.1	20,362
ECM 10	Install Programmable Thermostats	0	0.0	46.9	\$454	\$990	\$0	\$990	2.2	5,490
ECM 11	Install Occupancy-Controlled Thermostats	0	0.0	124.8	\$1,210	\$1,193	\$375	\$818	0.7	14,615
ECM 12	Install Pipe Insulation	0	0.0	2.2	\$21	\$29	\$10	\$19	0.9	257
Domestic Water Heating Upgrade		25	0.0	5.1	\$52	\$257	\$54	\$204	3.9	617
ECM 13	Install Low-Flow DHW Devices	25	0.0	5.1	\$52	\$257	\$54	\$204	3.9	617
Food Service & Refrigeration Measures		3,566	0.4	0.0	\$565	\$690	\$100	\$590	1.0	3,591
ECM 14	Vending Machine Control	3,566	0.4	0.0	\$565	\$690	\$100	\$590	1.0	3,591
TOTALS		354,791	77.7	117.1	\$54,474	\$219,129	\$39,709	\$179,420	3.3	370,983

* - 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).

MUNICIPAL COMPLEX

#	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			199,408	40.6	-41	\$29,256	\$82,283	\$21,509	\$60,774	2.1	195,944
ECM 1	Install LED Fixtures	Yes	3,285	0.0	0	\$488	\$1,241	\$150	\$1,091	2.2	3,308
ECM 2	Retrofit Fixtures with LED Lamps	Yes	196,123	40.6	-41	\$28,767	\$81,042	\$21,359	\$59,683	2.1	192,636
Lighting Control Measures			67,512	14.4	-14	\$9,902	\$54,698	\$10,345	\$44,353	4.5	66,301
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	59,291	13.3	-13	\$8,696	\$47,498	\$5,970	\$41,528	4.8	58,227
ECM 4	Install High/Low Lighting Controls	Yes	8,221	1.1	-2	\$1,206	\$7,200	\$4,375	\$2,825	2.3	8,073
Variable Frequency Drive (VFD) Measures			54,127	13.0	0	\$8,048	\$61,090	\$3,700	\$57,390	7.1	54,505
ECM 5	Install VFD on Variable Air Volume (VAV) Fans	Yes	3,413	0.9	0	\$507	\$3,884	\$200	\$3,684	7.3	3,437
ECM 6	Install VFDs on Constant Volume (CV) Fans	Yes	46,866	11.8	0	\$6,968	\$50,684	\$3,300	\$47,384	6.8	47,194
ECM 7	Install VFDs on Heating Water Pumps	Yes	3,847	0.4	0	\$572	\$6,522	\$200	\$6,322	11.1	3,874
Unitary HVAC Measures			50,871	25.2	0	\$7,564	\$262,422	\$10,238	\$252,185	33.3	51,227
ECM 8	Install High Efficiency Air Conditioning Units	No	1,010	0.6	0	\$150	\$6,246	\$0	\$6,246	41.6	1,017
ECM 9	Install High Efficiency Heat Pumps	No	49,862	24.5	0	\$7,414	\$256,176	\$10,238	\$245,939	33.2	50,210
HVAC System Improvements			0	0.0	2	\$21	\$29	\$10	\$19	0.9	257
ECM 10	Install Pipe Insulation	Yes	0	0.0	2	\$21	\$29	\$10	\$19	0.9	257
Domestic Water Heating Upgrade			25	0.0	2	\$24	\$222	\$42	\$180	7.5	274
ECM 11	Install Low-Flow DHW Devices	Yes	25	0.0	2	\$24	\$222	\$42	\$180	7.5	274
Food Service & Refrigeration Measures			1,954	0.2	0	\$291	\$460	\$50	\$410	1.4	1,968
ECM 12	Vending Machine Control	Yes	1,954	0.2	0	\$291	\$460	\$50	\$410	1.4	1,968
TOTALS (COST EFFECTIVE MEASURES)			323,025	68.3	-52	\$47,541	\$198,782	\$35,656	\$163,126	3.4	319,249
TOTALS (ALL MEASURES)			373,896	93.5	-52	\$55,104	\$461,204	\$45,894	\$415,311	7.5	370,476

* - 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).

PUBLIC WORKS COMPLEX

#	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			20,898	7.7	-4	\$3,517	\$12,241	\$2,786	\$9,455	2.7	20,573
ECM 1	Install LED Fixtures	Yes	3,235	1.8	0	\$546	\$3,830	\$500	\$3,330	6.1	3,204
ECM 2	Retrofit Fixtures with LED Lamps	Yes	17,663	5.9	-4	\$2,971	\$8,411	\$2,286	\$6,125	2.1	17,369
Lighting Control Measures			4,278	1.5	-1	\$719	\$5,658	\$830	\$4,828	6.7	4,201
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	4,079	1.5	-1	\$686	\$5,208	\$690	\$4,518	6.6	4,006
ECM 4	Install High/Low Lighting Controls	Yes	199	0.0	0	\$33	\$450	\$140	\$310	9.3	196
HVAC System Improvements			0	0.0	172	\$1,664	\$2,182	\$375	\$1,807	1.1	20,105
ECM 5	Install Programmable Thermostats	Yes	0	0.0	47	\$454	\$990	\$0	\$990	2.2	5,490
ECM 6	Install Occupancy-Controlled Thermostats	Yes	0	0.0	125	\$1,210	\$1,193	\$375	\$818	0.7	14,615
Domestic Water Heating Upgrade			0	0.0	3	\$28	\$36	\$12	\$24	0.9	343
ECM 7	Install Low-Flow DHW Devices	Yes	0	0.0	3	\$28	\$36	\$12	\$24	0.9	343
Food Service & Refrigeration Measures			1,612	0.2	0	\$274	\$230	\$50	\$180	0.7	1,623
ECM 8	Vending Machine Control	Yes	1,612	0.2	0	\$274	\$230	\$50	\$180	0.7	1,623
TOTALS (COST EFFECTIVE MEASURES)			26,788	9.4	170	\$6,203	\$20,347	\$4,053	\$16,295	2.6	46,845
TOTALS (ALL MEASURES)			26,788	9.4	170	\$6,203	\$20,347	\$4,053	\$16,295	2.6	46,845

* - 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

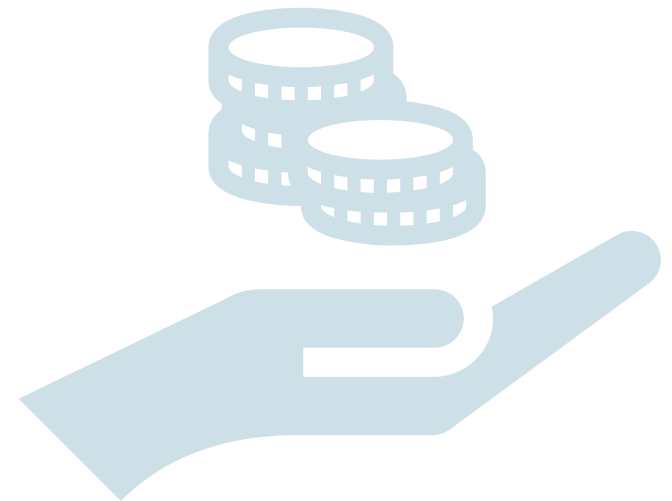
MEASURES FOR FUTURE CONSIDERATION

- Retro-Commissioning Study
- Upgrade/Replace Energy Management System
- Revolving Doors
- Electric Submeter

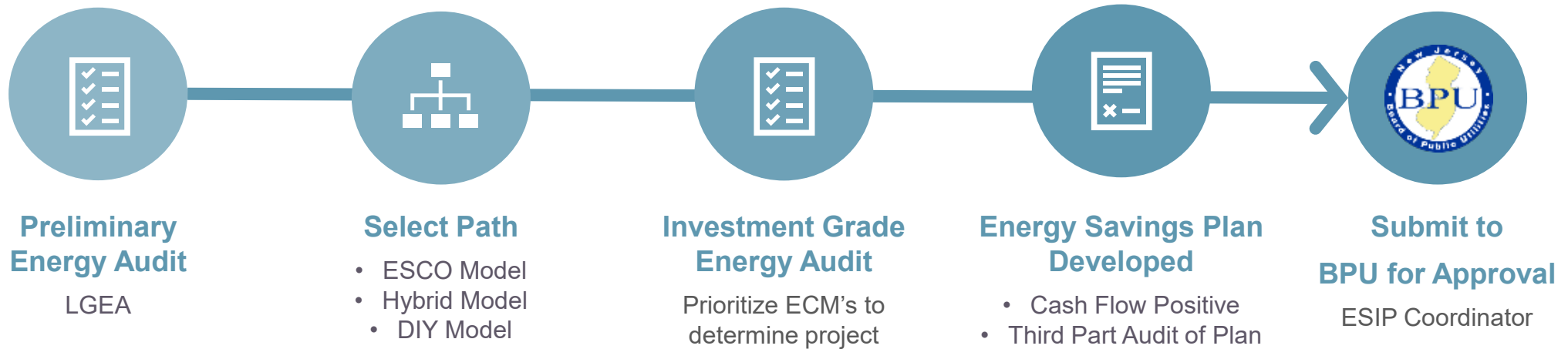
FINANCING MECHANISM: ESIP

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



ENERGY SAVINGS IMPROVEMENT PROGRAM

FOR MORE INFORMATION

Michelle Rossi

ESIP Coordinator

ESIP@bpu.nj.gov

o: 609.913.6295

c: 609.915.0903

C&I TRANSITION OF ENERGY EFFICIENCY PROGRAMS

<https://www.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

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

CLEAN FLEET ELECTRIC VEHICLE INCENTIVE PROGRAM

www.NJCleanEnergy.com/EV

- Electric vehicles are now included on the State Purchasing Contract under Award T0099
- Clean Fleet Electric Vehicle Incentive Program
 - Designed to encourage local and state governments to add EVs to their fleet
 - \$4,000 per battery electric vehicle (maximum of 2); and
 - \$1,500 for one Level-Two EV charging station
 - Grants awarded on rolling basis until funding expended
- Questions? EV.programs@bpu.nj.gov



FOR MORE INFORMATION

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Ryan Knippenberg – LGEA Energy Auditor

RKnippenberg@trccompanies.com

(732) 439-7184

THANK YOU

