

New Jersey's Clean Energy Program

LGEA Exit Meeting for:
Fort Lee Board of Education

TRC Energy Services

June 18, 2019

Introductions



Fort Lee Board of Education

- Peter Crawley – Assistant Business Administrator
- Haquisha Q. Taylor – Business Administrator
- Jack DeNichilo – Supervisor of Buildings & Grounds

NJ Clean Energy Program

- Yagna Otia, CEM – TRC Auditor
- Sarah Walters – TRC Account Manager
- Mike Mandzik – TRC Regional Outreach Manager
- Mike Thulen – ESIP Coordinator
- Michelle Rossi – State Energy Office
- Arif Welcher - BPU Government/Business Manager
- Evelyn Dowling - BPU Commissioner Holden's Office

Agenda



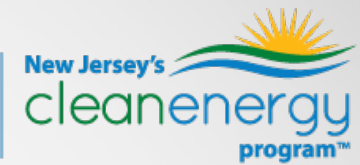
- The audit process overview
- Energy use & existing conditions
- Review of **E**nergy **C**onservation **M**easures (ECMs) identified
- Questions or concerns regarding the draft audit report
- Overview of NJCEP equipment incentives
- Next steps for Fort Lee Board of Education

LGEA Process



- Application Approval
- Scheduling Call
- Audit
- Benchmarking & Analysis
- Draft Report
- Exit Meeting Presentation
- Final Report

Site Visit and Utility Analysis



Overview of Systems, Baseline & Existing Conditions:

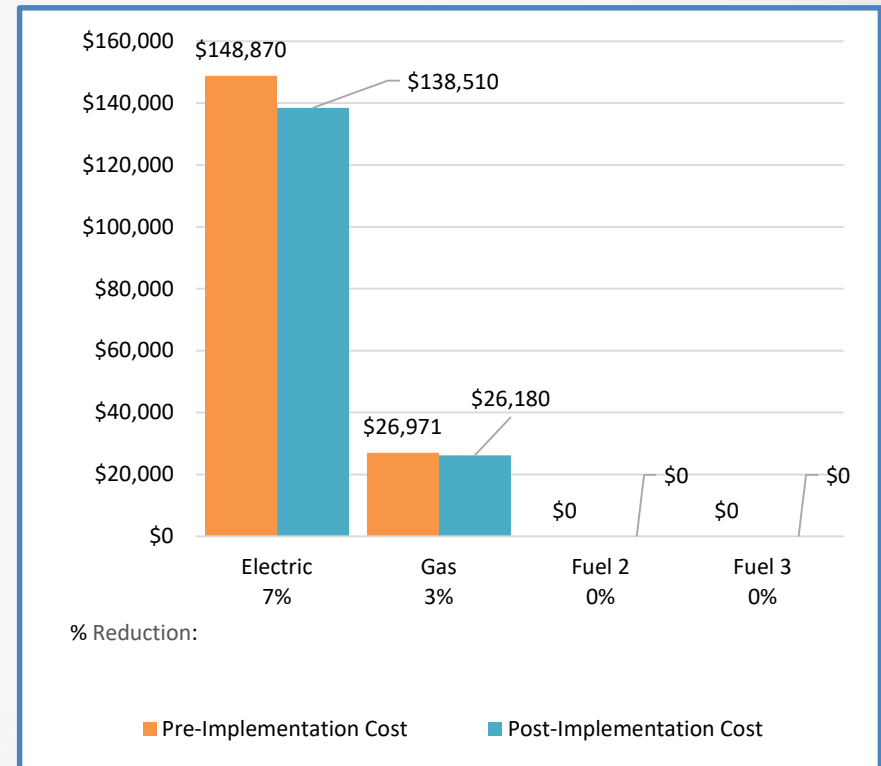
- Building Envelope
- Lighting System
- HVAC and Mechanical Systems
- Plug Load Equipment

Utility Consumption:

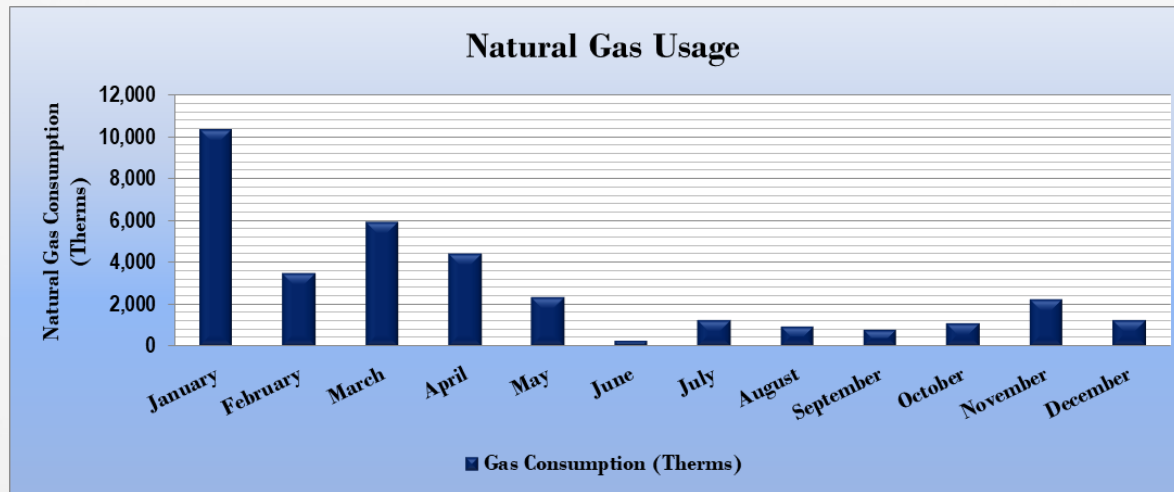
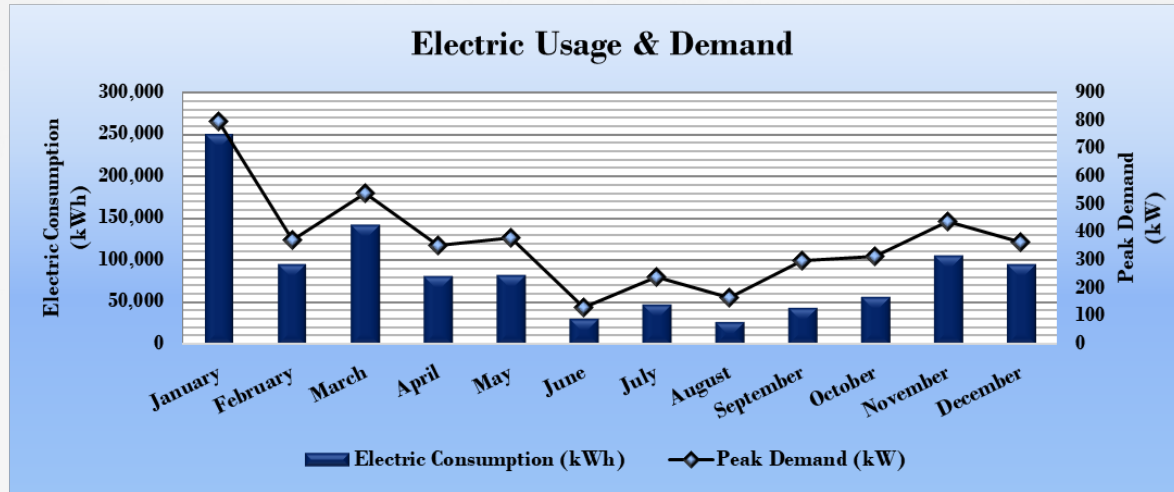
- Electric Consumption and Costs
- Natural Gas Consumption and Costs

Sites Visited/Analyzed

- School 1
- School 3



Utility Consumption



Benchmarking



School 1

ENERGY STAR® Statement of Energy Performance

24
ENERGY STAR® Score¹

School 1
Primary Property Type: K-12 School
Gross Floor Area (GFA): 64,300
Built: 1903
For Year Ending: February 28, 2018
Date Generated: April 03, 2019

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: School 1 2501 Ioyon St Fort Lee, New Jersey 07024	Property Owner: Fort Lee Public Schools 2175 Lemoine Ave, 8th Floor Fort Lee, NJ 7024 [Redacted]	Primary Contact: Huzayirsha Taylor 2175 Lemoine Ave, 8th Floor Fort Lee, NJ 7024 (201) 595-4612 x7512 htaylor@frees.com
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Property ID: 6064002

Energy Consumption and Energy Use Intensity (EUI)

Site EUI 62.5 kBtu/ft ²	Annual Energy by Fuel Natural Gas (kBtu) 1,727,721 (87%) Electric - Grid (kBtu) 2,293,075 (87%)	National Median Comparison National Median Site EUI (kBtu/ft ²) 48.3 National Median Source EUI (kBtu/ft ²) 96.9 % Diff from National Median Source EUI 36% Annual Renewable Greenhouse Gas Emissions (Metric Tons CO ₂ e/year) 324
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Source EUI
128.1 kBtu/ft²

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

Professional Engineer Stamp (if applicable)

Building Name	ENERGY STAR Score
School 1	24
School 3	15

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.

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 (lbs)
Lighting Upgrades	17,420	5.5	-3.6	\$2,431	\$7,738	\$1,364	\$6,374	2.6	17,116
Retrofit Fluorescent Fixtures with LED Lamps and Drivers	7,062	2.2	-1.5	\$986	\$4,264	\$670	\$3,594	3.6	6,938
Retrofit Fixtures with LED Lamps	10,359	3.3	-2.2	\$1,445	\$3,474	\$694	\$2,780	1.9	10,177
Lighting Control Measures	11,564	3.6	-2.4	\$1,599	\$19,884	\$1,370	\$18,514	11.6	11,362
Install Occupancy Sensor Lighting Controls	7,568	2.4	-1.6	\$1,044	\$14,284	\$1,370	\$12,914	12.4	7,436
Install High/Low Lighting Controls	3,996	1.2	-0.8	\$556	\$5,600	\$0	\$5,600	10.1	3,926
Motor Upgrades	1,773	0.5	0.0	\$243	\$5,561	\$0	\$5,561	22.9	1,786
Premium Efficiency Motors	1,773	0.5	0.0	\$243	\$5,561	\$0	\$5,561	22.9	1,786
Variable Frequency Drive (VFD) Measures	39,886	9.6	0.0	\$5,540	\$34,006	\$2,400	\$31,606	5.7	40,165
Install VFDs on Constant Volume (CV) Fans	31,409	8.8	0.0	\$4,379	\$22,726	\$2,400	\$20,326	4.6	31,629
Install VFDs on Heating Water Pumps	8,477	0.9	0.0	\$1,160	\$11,280	\$0	\$11,280	9.7	8,536
Gas Heating (HVAC/Process) Replacement	0	0.0	153.4	\$1,351	\$84,672	\$9,335	\$75,336	55.7	17,966
Install High Efficiency Hot Water Boilers	0	0.0	153.4	\$1,351	\$84,672	\$9,335	\$75,336	55.7	17,966
HVAC System Improvements	0	0.0	25.2	\$222	\$1,359	\$0	\$1,359	6.1	2,951
Implement Demand Control Ventilation (DCV)	0	0.0	25.2	\$222	\$1,359	\$0	\$1,359	6.1	2,951
Domestic Water Heating Upgrade	8,341	0.0	79.7	\$1,762	\$272	\$0	\$272	0.2	17,732
Install Low-Flow DHW Devices	8,341	0.0	79.7	\$1,762	\$272	\$0	\$272	0.2	17,732
Custom Measures	21,795	3.8	561.8	\$7,446	\$482,400	\$0	\$482,400	64.8	87,726
Install Building Automation System	21,795	3.8	561.8	\$7,446	\$482,400	\$0	\$482,400	64.8	87,726
TOTALS	100,780	23.1	814.1	\$20,595	\$635,893	\$14,469	\$621,424	30.2	196,803

* - 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*



* Opportunities considered cost effective have a payback period less than 2/3rds of the useful life of the measure

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 (lbs)
Lighting Upgrades		17,420	5.5	-3.6	\$2,431	\$7,738	\$1,364	\$6,374	2.6	17,116
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	7,062	2.2	-1.5	\$986	\$4,264	\$670	\$3,594	3.6	6,938
ECM 2	Retrofit Fixtures with LED Lamps	10,359	3.3	-2.2	\$1,445	\$3,474	\$694	\$2,780	1.9	10,177
Lighting Control Measures		6,832	2.1	-1.4	\$939	\$9,344	\$370	\$8,974	9.6	6,713
ECM 3	Install Occupancy Sensor Lighting Controls	2,836	0.9	-0.6	\$383	\$3,744	\$370	\$3,374	8.8	2,787
ECM 0	Install Daylight Dimming Controls	0	0.0	0.0	\$0	\$0	\$0	\$0	0.0	0
ECM 4	Install High/Low Lighting Controls	3,996	1.2	-0.8	\$556	\$5,600	\$0	\$5,600	10.1	3,926
Motor Upgrades		1,773	0.5	0.0	\$243	\$5,561	\$0	\$5,561	22.9	1,786
ECM 5	Premium Efficiency Motors	1,773	0.5	0.0	\$243	\$5,561	\$0	\$5,561	22.9	1,786
Variable Frequency Drive (VFD) Measures		39,886	9.6	0.0	\$5,540	\$34,006	\$2,400	\$31,606	5.7	40,165
ECM 6	Install VFDs on Constant Volume (CV) Fans	31,409	8.8	0.0	\$4,379	\$22,726	\$2,400	\$20,326	4.6	31,629
ECM 7	Install VFDs on Heating Water Pumps	8,477	0.9	0.0	\$1,160	\$11,280	\$0	\$11,280	9.7	8,536
HVAC System Improvements		0	0.0	25.2	\$222	\$1,359	\$0	\$1,359	6.1	2,951
ECM 8	Implement Demand Control Ventilation (DCV)	0	0.0	25.2	\$222	\$1,359	\$0	\$1,359	6.1	2,951
Domestic Water Heating Upgrade		8,341	0.0	79.7	\$1,762	\$272	\$0	\$272	0.2	17,732
ECM 9	Install Low-Flow DHW Devices	8,341	0.0	79.7	\$1,762	\$272	\$0	\$272	0.2	17,732
TOTALS		74,253	17.8	99.8	\$11,136	\$58,281	\$4,134	\$54,147	4.9	86,462

* - 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).

School 1



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		17,302	5.5	-4	\$2,415	\$36,225	\$7,721	\$1,363	\$6,358	2.6	17,000
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	7,062	2.2	-1	\$986	\$14,785	\$4,264	\$670	\$3,594	3.6	6,938
ECM 2	Retrofit Fixtures with LED Lamps	10,241	3.3	-2	\$1,429	\$21,441	\$3,457	\$693	\$2,764	1.9	10,062
Lighting Control Measures		8,298	2.6	-2	\$1,158	\$9,265	\$15,540	\$1,000	\$14,540	12.6	8,153
ECM 3	Install Occupancy Sensor Lighting Controls	4,732	1.5	-1	\$660	\$5,283	\$10,540	\$1,000	\$9,540	14.4	4,649
ECM 4	Install High/Low Lighting Controls	3,566	1.1	-1	\$498	\$3,982	\$5,000	\$0	\$5,000	10.0	3,504
Variable Frequency Drive (VFD) Measures		18,948	5.3	0	\$2,673	\$40,100	\$13,846	\$1,440	\$12,406	4.6	19,081
ECM 5	Install VFDs on Constant Volume (CV) Fans	18,948	5.3	0	\$2,673	\$40,100	\$13,846	\$1,440	\$12,406	4.6	19,081
Domestic Water Heating Upgrade		0	0.0	51	\$370	\$3,698	\$129	\$0	\$129	0.3	6,000
ECM 6	Install Low-Flow DHW Devices	0	0.0	51	\$370	\$3,698	\$129	\$0	\$129	0.3	6,000
Custom Measures		9,980	1.8	331	\$3,798	\$56,969	\$184,800	\$0	\$184,800	48.7	48,829
ECM 7	Install Building Automation System	9,980	1.8	331	\$3,798	\$56,969	\$184,800	\$0	\$184,800	48.7	48,829
TOTALS (COST EFFECTIVE MEASURES)		39,817	11.9	47	\$5,956	\$84,005	\$26,696	\$2,803	\$23,893	4.0	45,584
TOTALS (ALL MEASURES)		54,529	15.2	377	\$10,414	\$146,258	\$222,036	\$3,803	\$218,233	21.0	99,062

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

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

School 3



#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		118	0.0	0	\$16	\$239	\$17	\$1	\$16	1.0	116
ECM 1	Retrofit Fixtures with LED Lamps	118	0.0	0	\$16	\$239	\$17	\$1	\$16	1.0	116
Lighting Control Measures		3,266	1.0	-1	\$441	\$3,529	\$4,344	\$370	\$3,974	9.0	3,209
ECM 2	Install Occupancy Sensor Lighting Controls	2,836	0.9	-1	\$383	\$3,065	\$3,744	\$370	\$3,374	8.8	2,787
ECM 3	Install High/Low Lighting Controls	430	0.1	0	\$58	\$464	\$600	\$0	\$600	10.3	422
Motor Upgrades		1,773	0.5	0	\$243	\$3,642	\$5,561	\$0	\$5,561	22.9	1,786
ECM 4	Premium Efficiency Motors	1,773	0.5	0	\$243	\$3,642	\$5,561	\$0	\$5,561	22.9	1,786
Variable Frequency Drive (VFD) Measures		20,938	4.3	0	\$2,866	\$42,994	\$20,160	\$960	\$19,200	6.7	21,084
ECM 5	Install VFDs on Constant Volume (CV) Fans	12,461	3.5	0	\$1,706	\$25,587	\$8,880	\$960	\$7,920	4.6	12,548
ECM 6	Install VFDs on Heating Water Pumps	8,477	0.9	0	\$1,160	\$17,407	\$11,280	\$0	\$11,280	9.7	8,536
Gas Heating (HVAC/Process) Replacement		0	0.0	153	\$1,351	\$27,029	\$84,672	\$9,335	\$75,336	55.7	17,966
ECM 7	Install High Efficiency Hot Water Boilers	0	0.0	153	\$1,351	\$27,029	\$84,672	\$9,335	\$75,336	55.7	17,966
HVAC System Improvements		0	0.0	25	\$222	\$3,329	\$1,359	\$0	\$1,359	6.1	2,951
ECM 8	Implement Demand Control Ventilation (DCV)	0	0.0	25	\$222	\$3,329	\$1,359	\$0	\$1,359	6.1	2,951
Domestic Water Heating Upgrade		8,341	0.0	28	\$1,393	\$13,926	\$143	\$0	\$143	0.1	11,733
ECM 9	Install Low-Flow DHW Devices	8,341	0.0	28	\$1,393	\$13,926	\$143	\$0	\$143	0.1	11,733
Custom Measures		11,815	2.0	231	\$3,648	\$54,725	\$297,600	\$0	\$297,600	81.6	38,896
ECM 10	Install Building Automation System	11,815	2.0	231	\$3,648	\$54,725	\$297,600	\$0	\$297,600	81.6	38,896
TOTALS (COST EFFECTIVE MEASURES)		34,436	5.8	53	\$5,181	\$67,659	\$31,585	\$1,331	\$30,254	5.8	40,878
TOTALS (ALL MEASURES)		46,252	7.8	437	\$10,180	\$149,413	\$413,857	\$10,666	\$403,191	39.6	97,741

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

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

Solar Energy Generation Potential



	School 1	School 3
<i>Potential:</i>	HIGH	HIGH
<i>System Potential: (kW)</i>	129	118
<i>Electric Generation: (kWh per year)</i>	153,687	140,582
<i>Displaced Cost: (per year)</i>	\$21,680	\$19,240

For more information on the SREC Registration Program (SRP) please visit:

<http://www.njcleanenergy.com/renewable-energy/programs/solar-renewable-energy-certificates-srec/new-jersey-solar-renewable-energy>

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

Clean Energy Program Portfolio



ELIGIBLE SECTORS

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

INCENTIVE PROGRAMS

Equipment Rebates:

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

Whole Buildings:

- Pay for Performance

Energy Generation:

- Combined Heat and Power (CHP)

OTHER PROGRAMS

Renewable Energy Generation:

- SREC Registration Program (SRP)

* eligible programs are highlighted in yellow

Recommended NJCEP Incentives per Building



Entity Name	Pay For Performance	Direct Install	SmartStart	CTEEP
School 1	X		X	X
School 3		X	X	X

Pay for Performance: Overview



- Comprehensive, whole-building approach to saving energy in existing or new facilities
- Qualification based on energy consumption, energy savings and measure types
- Customer chooses from network of pre-approved ***Participating Partners***
- Incentives paid in three installments at milestones
 - Incentives up to \$2MM per project (\$4MM entity cap/year)
 - \$1 million for electric measures
 - \$1 million for gas measures
 - Incentives up to 50% of total project cost

www.NJCleanEnergy/P4P

Pay for Performance: Process



Submittal and Approval of Application

Development and Approval of Energy Reduction Plan (ERP)

Installation of Recommended Measures

Submittal and Approval of As-Built ERP and Cx Report

Post Construction Verification of Savings

Incentive #1
fixed between \$3,750-\$25,000

Incentive #2
up to 25% project cost

Incentive #3
up to 25% project cost

1 year

Pay for Performance: Details



Incentive #1: Energy Reduction Plan			
Incentive Amount:		\$0.15	per sq ft
Minimum Incentive:		\$3,750	
Maximum Incentive:		\$25,000	or 50% of facility annual energy cost
Incentive #2: Installation of Recommended Measures			
Minimum Performance Target:		15%	
Electric Incentives	Base Incentive based on 15% savings:	\$0.09	per projected kWh saved
	For each % over 15% add:	\$0.005	
	Maximum Incentive:	\$0.11	
Gas Incentives	Base Incentive based on 15 % savings:	\$0.90	per projected Therm saved
	For each % over 15% add:	\$0.05	
	Maximum Incentive:	\$1.25	
Incentive Cap:		25%	of total project cost
Incentive #3: Post-Construction Benchmarking Report			
Minimum Performance Target:		15%	
Electric Incentives	Base Incentive based on 15% savings:	\$0.09	per projected kWh saved
	For each % over 15% add:	\$0.005	
	Maximum Incentive:	\$0.11	
Gas Incentives	Base Incentive based on 15% savings:	\$0.90	per projected Therm saved
	For each % over 15% add:	\$0.05	
	Maximum Incentive:	\$1.25	
Incentive Cap:		25%	of total project cost

Direct Install: Overview



- Turn-key retrofit program to replace outdated and inefficient equipment, including lighting, HVAC, refrigeration, etc.
- Open to Small to Mid-Sized Commercial and Industrial facilities with an average electric demand ≤ 200 kW
- Provides incentives of up to 70% of the installed cost
- Incentives are paid directly to the contractor
 - Customer only pays remaining 30% of installed cost
 - \$125,000 project/building cap
 - \$250,000 per entity cap (up to \$500,000 if using ESIP)
- Participating contractors provide support and process all paperwork
- Fast turnaround time: Average length of time for job completion (4-6 months)

www.NJCleanEnergy/DI

Direct Install:



Participating Contractor

Lime Energy

Fran Burke

732-259-4136

fburke@lime-energy.com

SmartStart: Overview



- Two types of incentives for high efficiency equipment installation:
 - Prescriptive
 - Custom
- Project Categories:
 - New Construction
 - Renovation
 - Remodeling
 - Equipment Replacement
- Project pre-approval required for lighting and custom measures
- Incentives up to \$500,000 per electric account & \$500,000 per natural gas account
- Specific incentives and individual applications for Lighting, HVAC, VFDs, Refrigeration, Controls and more!

www.NJCleanEnergy/SSB

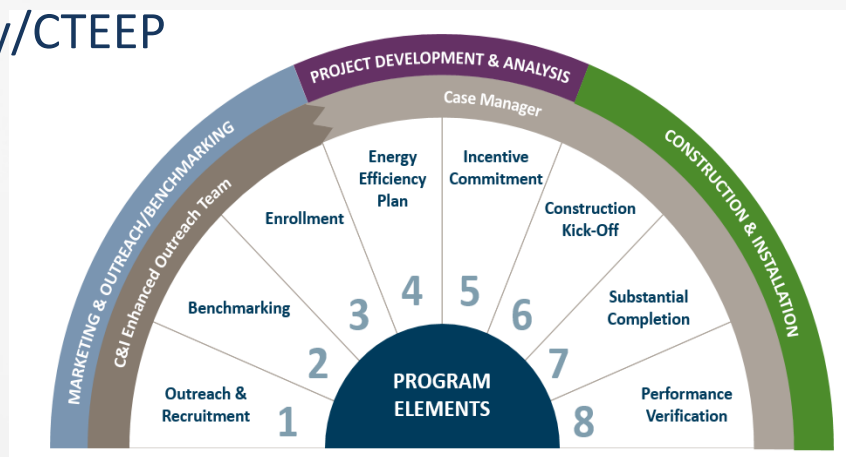
CTEEP: Overview



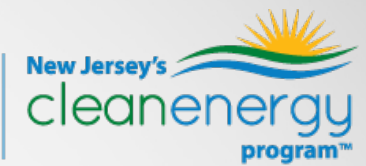
Customer Tailored Energy Efficiency Pilot (CTEEP)

- Provide customers with **on-site assistance** to discuss project opportunities and program incentives.
- A **single application** submission streamlines multiple prescriptive and custom measures.
- Provide **technical assistance incentives** to help offset soft costs associated with developing and planning an energy efficiency project.
- Incentives up to \$250,000 entity cap.

www.NJCleanEnergy/CTEEP



Recommended NJCEP Incentives per Building



Entity Name	Pay For Performance	Direct Install	SmartStart	CTEEP
School 1	X		X	X
School 3		X	X	X

Energy Savings Improvement Program (ESIP)

- Provides alternative financing for energy savings projects at public institutions. Value of energy savings leveraged to pay for cost of EE projects over a 15 year contract. Does not count as debt/require voter approval.
- Requires an audit as 1st step (LGEA satisfies requirement)
- ESIP participation question on LGEA application
- Program administered directly by BPU

ESIP Process

New Jersey's Clean Energy Program Interaction

Initial Energy Audit completed
for entity building(s)

Local Government Energy Audit
(LGEA) may be used to meet
this requirement

Entity issues ESIP RFP (previously
approved by BPU) and selects ESCO
or DIY approach

Investment Grade Energy Audit completed
and Energy Savings Plan (ESP)
developed

P4P Energy Reduction Plan (ERP),
Direct Install, or SmartStart application
recommended submittal time frame

Third party review of ESP

Review and approval of ESP
by Board of Public Utilities (BPU)

Entity adopts ESP,
determines guarantee



FOR MORE INFORMATION

ESIP

Mike Thulen

ESIP Coordinator

Office: 609-777-3338

Cell: 732-330-2419

ESIP@bpu.nj.gov

Questions



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FOR MORE INFORMATION

Visit NJCleanEnergy.com

Call (866) NJSMART

Mike Mandzik

Regional Outreach Manager

732.570.7534

mmandzik@trcsolutions.com