

# New Jersey's Clean Energy Program

LGEA Exit Meeting for:  
*Sayreville Public Schools*

TRC Energy Services

November 30, 2018

# Introductions

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- *Sayreville Public Schools*
  - Dr. Richard Labbe – Superintendent
  - Erin Hill – Business Administrator
  - Dawn Cheery – Assistant Business Administrator
  - Jim Kolmansperger – Director of Facilities
- *NJ Clean Energy Program*
  - Brian DeLuca, CEM – TRC Program Manager
  - Aimee Lalonde – TRC Auditor
  - Elizabeth Ebinger – TRC Account Manager

# Agenda

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

# LGEA Process

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- 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

## Utility Consumption:

- Electric Consumption and Costs
- Natural Gas Consumption and Costs

## Sites Visited/Analyzed

- Harry S. Truman School
- Wilson School
- Samsel Upper Elementary School
- Sayreville Middle School
- Sayreville War Memorial High School
- Emma L Arleth School
- Dwight D. Eisenhower School
- Selover School (BOE Offices)

# Benchmarking



## Harry Truman School

**ENERGY STAR® Statement of Energy Performance**

**71**  
ENERGY STAR® Score<sup>1</sup>

**Harry S. Truman School**  
Primary Property Type: K-12 School  
Gross Floor Area (ft²): 53,275  
Built: 1973  
For Year Ending: February 28, 2018  
Date Generated: October 02, 2018

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**

<b>Property Address</b> Harry S. Truman School 1 Taft Place Parlin, New Jersey 08859	<b>Property Owner</b> Sayreville Board of Education 3198 Washington Rd Sayreville, NJ 08871 ( ) -	<b>Primary Contact</b> Erin Hill 3198 Washington Rd Sayreville, NJ 08871 732-525-5204 Erin.Hill@sayrevillek12.net
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Property ID: 6563194

**Energy Consumption and Energy Use Intensity (EUI)**

Site EUI	Annual Energy by Fuel	National Median Comparison
54.7 kBtu/ft²	Natural Gas (kBtu) 1,707,792 (56%)	National Median Site EUI (kBtu/ft²) 68.8
	Electric - Grid (kBtu) 1,207,291 (41%)	National Median Source EUI (kBtu/ft²) 122.1
		% Diff from National Median Source EUI -20%
<b>Source EUI</b> 97.1 kBtu/ft²		Annual Emissions Greenhouse Gas Emissions (Metric Tons CO2e/year) 213

**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

\_\_\_\_\_  
( ) -

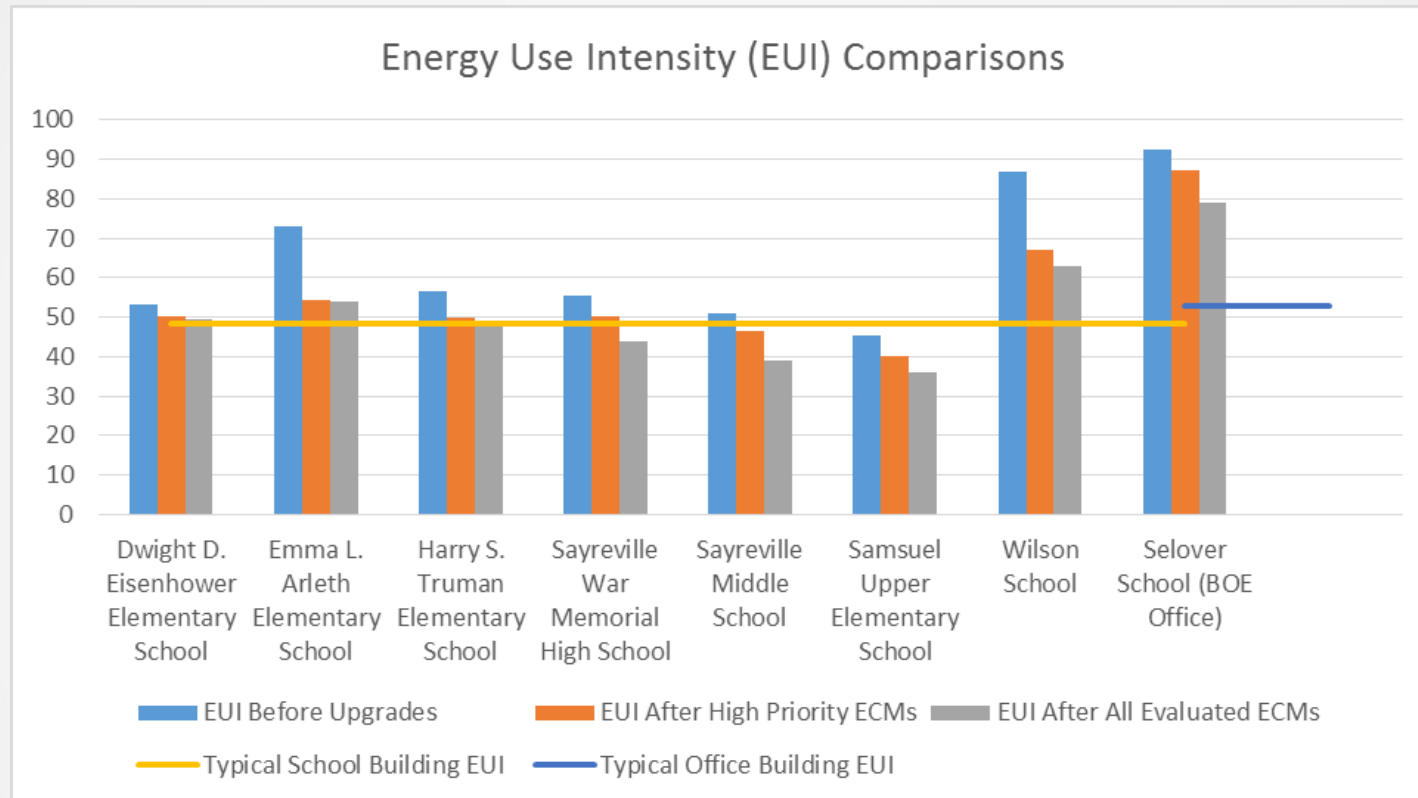
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Professional Engineer Stamp  
(if applicable)

Building Name	ENERGY STAR Score
Harry Truman School	71
Wilson School	17
Samsel Upper Elementary School	71
Sayreville Middle School	70
Sayreville War Memorial HS	66
Emma L. Arleth School	44
Dwight D. Eisenhower School	64
Selover School	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



EUI Values are the energy use intensity of your building's which is represented as kBtu/sqft. 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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>	<b>883,680</b>	<b>246.8</b>	<b>-180.6</b>	<b>\$112,030</b>	<b>\$706,012</b>	<b>\$120,385</b>	<b>\$585,627</b>	<b>5.2</b>	<b>868,716</b>
Install LED Fixtures	249,938	10.7	-4.2	\$32,269	\$250,076	\$16,025	\$234,051	7.3	251,199
Retrofit Fluorescent Fixtures with LED Lamps and Drivers	67,974	22.4	-14.9	\$8,357	\$53,329	\$7,825	\$45,504	5.4	66,709
Retrofit Fixtures with LED Lamps	565,769	213.7	-161.6	\$71,404	\$402,607	\$96,535	\$306,072	4.3	550,808
<b>Lighting Control Measures</b>	<b>94,453</b>	<b>30.1</b>	<b>-22.5</b>	<b>\$11,808</b>	<b>\$128,712</b>	<b>\$13,950</b>	<b>\$114,762</b>	<b>9.7</b>	<b>92,474</b>
Install Occupancy Sensor Lighting Controls	78,396	25.9	-18.6	\$9,782	\$106,322	\$13,565	\$92,757	9.5	76,772
Install Daylight Dimming Controls	1,022	0.1	-0.1	\$130	\$990	\$385	\$605	4.7	1,016
Install High/Low Lighting Controls	15,035	4.2	-3.9	\$1,897	\$21,400	\$0	\$21,400	11.3	14,687
<b>Motor Upgrades</b>	<b>20,096</b>	<b>6.2</b>	<b>0.0</b>	<b>\$2,558</b>	<b>\$80,123</b>	<b>\$0</b>	<b>\$80,123</b>	<b>31.3</b>	<b>20,237</b>
Premium Efficiency Motors	20,096	6.2	0.0	\$2,558	\$80,123	\$0	\$80,123	31.3	20,237
<b>Variable Frequency Drive (VFD) Measures</b>	<b>324,912</b>	<b>95.7</b>	<b>0.0</b>	<b>\$41,540</b>	<b>\$237,736</b>	<b>\$22,833</b>	<b>\$214,904</b>	<b>5.2</b>	<b>327,184</b>
Install VFD on Variable Air Volume (VAV) Fans	4,811	3.3	0.0	\$599	\$10,159	\$2,713	\$7,446	12.4	4,844
Install VFDs on Constant Volume (CV) Fans	177,047	68.0	0.0	\$22,675	\$141,607	\$20,120	\$121,487	5.4	178,285
Install VFDs on Chilled Water Pumps	8,131	2.8	0.0	\$1,112	\$5,194	\$0	\$5,194	4.7	8,188
Install VFDs on Heating Water Pumps	134,924	21.6	0.0	\$17,154	\$80,776	\$0	\$80,776	4.7	135,867
<b>Electric Unitary HVAC Measures</b>	<b>364,397</b>	<b>135.8</b>	<b>0.0</b>	<b>\$45,968</b>	<b>\$1,390,364</b>	<b>\$44,541</b>	<b>\$1,345,823</b>	<b>29.3</b>	<b>366,945</b>
Install High Efficiency Air Conditioning Units	195,592	122.4	0.0	\$25,098	\$1,178,776	\$33,694	\$1,145,082	45.6	196,960
Install High Efficiency Heat Pumps	168,804	13.5	0.0	\$20,870	\$211,588	\$10,847	\$200,741	9.6	169,985
<b>Electric Chiller Replacement</b>	<b>18,198</b>	<b>27.4</b>	<b>0.0</b>	<b>\$2,489</b>	<b>\$153,573</b>	<b>\$16,560</b>	<b>\$137,013</b>	<b>55.1</b>	<b>18,325</b>
Install High Efficiency Chillers	18,198	27.4	0.0	\$2,489	\$153,573	\$16,560	\$137,013	55.1	18,325
<b>Gas Heating (HVAC/Process) Replacement</b>	<b>0</b>	<b>0.0</b>	<b>4,828.8</b>	<b>\$41,978</b>	<b>\$858,062</b>	<b>\$35,740</b>	<b>\$822,323</b>	<b>19.6</b>	<b>565,395</b>
Install High Efficiency Hot Water Boilers	0	0.0	3,676.9	\$31,833	\$570,608	\$19,269	\$551,338	17.3	430,524
Install High Efficiency Steam Boilers	0	0.0	275.5	\$2,425	\$65,591	\$2,470	\$63,121	26.0	32,260
Install High Efficiency Furnaces	0	0.0	876.4	\$7,719	\$221,864	\$14,000	\$207,864	26.9	102,611
<b>HVAC System Improvements</b>	<b>3,541</b>	<b>0.0</b>	<b>49.3</b>	<b>\$925</b>	<b>\$2,019</b>	<b>\$0</b>	<b>\$2,019</b>	<b>2.2</b>	<b>9,343</b>
Implement Demand Control Ventilation (DCV)	728	0.0	17.2	\$257	\$1,359	\$0	\$1,359	5.3	2,750
Install Pipe Insulation	2,813	0.0	32.1	\$668	\$659	\$0	\$659	1.0	6,593
<b>Domestic Water Heating Upgrade</b>	<b>0</b>	<b>0.0</b>	<b>277.6</b>	<b>\$2,436</b>	<b>\$26,776</b>	<b>\$1,348</b>	<b>\$25,428</b>	<b>10.4</b>	<b>32,509</b>
Install High Efficiency Gas-Fired Water Heater	0	0.0	49.9	\$431	\$22,807	\$748	\$22,058	51.2	5,842
Install Tankless Water Heater	0	0.0	2.5	\$22	\$1,503	\$600	\$903	40.4	297
Install Low-Flow DHW Devices	0	0.0	225.2	\$1,983	\$2,467	\$0	\$2,467	1.2	26,370
<b>Food Service Equipment &amp; Refrigeration Measures</b>	<b>18,476</b>	<b>2.0</b>	<b>0.0</b>	<b>\$2,320</b>	<b>\$28,256</b>	<b>\$240</b>	<b>\$28,016</b>	<b>12.1</b>	<b>18,605</b>
Refrigerator/Freezer Case Electrically Commutated Motors	2,294	0.3	0.0	\$302	\$1,820	\$40	\$1,780	5.9	2,310
Refrigeration Controls	1,860	0.1	0.0	\$238	\$1,674	\$75	\$1,599	6.7	1,873
Replace Refrigeration Equipment	14,323	1.6	0.0	\$1,780	\$24,763	\$125	\$24,638	13.8	14,423
<b>Plug Load Equipment Control - Vending Machine</b>	<b>17,730</b>	<b>2.0</b>	<b>0.0</b>	<b>\$2,284</b>	<b>\$2,530</b>	<b>\$550</b>	<b>\$1,980</b>	<b>0.9</b>	<b>17,854</b>
Vending Machine Control	17,730	2.0	0.0	\$2,284	\$2,530	\$550	\$1,980	0.9	17,854
<b>TOTALS</b>	<b>1,745,484</b>	<b>546.1</b>	<b>4,952.7</b>	<b>\$266,335</b>	<b>\$3,614,164</b>	<b>\$256,146</b>	<b>\$3,358,018</b>	<b>12.6</b>	<b>2,337,587</b>

\* - 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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>883,680</b>	<b>246.8</b>	<b>-180.6</b>	<b>\$112,030</b>	<b>\$706,012</b>	<b>\$120,385</b>	<b>\$585,627</b>	<b>5.2</b>	<b>868,716</b>
ECM 1	Install LED Fixtures	249,938	10.7	-4.2	\$32,269	\$250,076	\$16,025	\$234,051	7.3	251,199
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	67,974	22.4	-14.9	\$8,357	\$53,329	\$7,825	\$45,504	5.4	66,709
ECM 3	Retrofit Fixtures with LED Lamps	565,769	213.7	-161.6	\$71,404	\$402,607	\$96,535	\$306,072	4.3	550,808
<b>Lighting Control Measures</b>		<b>93,238</b>	<b>29.8</b>	<b>-22.3</b>	<b>\$11,642</b>	<b>\$126,912</b>	<b>\$13,950</b>	<b>\$112,962</b>	<b>9.7</b>	<b>91,281</b>
ECM 4	Install Occupancy Sensor Lighting Controls	78,396	25.9	-18.6	\$9,782	\$106,322	\$13,565	\$92,757	9.5	76,772
ECM 5	Install Daylight Dimming Controls	1,022	0.1	-0.1	\$130	\$990	\$385	\$605	4.7	1,016
ECM 6	Install High/Low Lighting Controls	13,820	3.8	-3.6	\$1,731	\$19,600	\$0	\$19,600	11.3	13,493
<b>Motor Upgrades</b>		<b>12,897</b>	<b>3.8</b>	<b>0.0</b>	<b>\$1,662</b>	<b>\$57,067</b>	<b>\$0</b>	<b>\$57,067</b>	<b>34.3</b>	<b>12,988</b>
ECM 7	Premium Efficiency Motors	12,897	3.8	0.0	\$1,662	\$57,067	\$0	\$57,067	34.3	12,988
<b>Variable Frequency Drive (VFD) Measures</b>		<b>292,394</b>	<b>76.6</b>	<b>0.0</b>	<b>\$37,489</b>	<b>\$195,707</b>	<b>\$16,120</b>	<b>\$179,587</b>	<b>4.8</b>	<b>294,439</b>
ECM 8	Install VFDs on Constant Volume (CV) Fans	155,891	53.7	0.0	\$20,041	\$119,564	\$16,120	\$103,444	5.2	156,981
ECM 9	Install VFDs on Chilled Water Pumps	8,131	2.8	0.0	\$1,112	\$5,194	\$0	\$5,194	4.7	8,188
ECM 10	Install VFDs on Heating Water Pumps	128,372	20.2	0.0	\$16,336	\$70,948	\$0	\$70,948	4.3	129,269
<b>Electric Unitary HVAC Measures</b>		<b>75,732</b>	<b>2.3</b>	<b>0.0</b>	<b>\$9,189</b>	<b>\$24,714</b>	<b>\$1,185</b>	<b>\$23,529</b>	<b>2.6</b>	<b>76,262</b>
ECM 11	Install High Efficiency Heat Pumps	75,732	2.3	0.0	\$9,189	\$24,714	\$1,185	\$23,529	2.6	76,262
<b>Gas Heating (HVAC/Process) Replacement</b>		<b>0</b>	<b>0.0</b>	<b>1,604.4</b>	<b>\$13,717</b>	<b>\$163,815</b>	<b>\$18,869</b>	<b>\$144,945</b>	<b>10.6</b>	<b>187,860</b>
ECM 12	Install High Efficiency Hot Water Boilers	0	0.0	1,604.4	\$13,717	\$163,815	\$18,869	\$144,945	10.6	187,860
<b>HVAC System Improvements</b>		<b>3,541</b>	<b>0.0</b>	<b>49.3</b>	<b>\$925</b>	<b>\$2,019</b>	<b>\$0</b>	<b>\$2,019</b>	<b>2.2</b>	<b>9,343</b>
ECM 13	Implement Demand Control Ventilation (DCV)	728	0.0	17.2	\$257	\$1,359	\$0	\$1,359	5.3	2,750
ECM 14	Install Pipe Insulation	2,813	0.0	32.1	\$668	\$659	\$0	\$659	1.0	6,593
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>225.2</b>	<b>\$1,983</b>	<b>\$2,467</b>	<b>\$0</b>	<b>\$2,467</b>	<b>1.2</b>	<b>26,370</b>
ECM 15	Install Low-Flow DHW Devices	0	0.0	225.2	\$1,983	\$2,467	\$0	\$2,467	1.2	26,370
<b>Food Service Equipment &amp; Refrigeration Measures</b>		<b>3,170</b>	<b>0.2</b>	<b>0.0</b>	<b>\$406</b>	<b>\$1,977</b>	<b>\$115</b>	<b>\$1,862</b>	<b>4.6</b>	<b>3,193</b>
ECM 16	Refrigerator/Freezer Case Electrically Commutated Motors	1,311	0.2	0.0	\$168	\$303	\$40	\$263	1.6	1,320
ECM 17	Refrigeration Controls	1,860	0.1	0.0	\$238	\$1,674	\$75	\$1,599	6.7	1,873
<b>Plug Load Equipment Control - Vending Machine</b>		<b>17,730</b>	<b>2.0</b>	<b>0.0</b>	<b>\$2,284</b>	<b>\$2,530</b>	<b>\$550</b>	<b>\$1,980</b>	<b>0.9</b>	<b>17,854</b>
ECM 18	Vending Machine Control	17,730	2.0	0.0	\$2,284	\$2,530	\$550	\$1,980	0.9	17,854
<b>TOTALS</b>		<b>1,382,384</b>	<b>361.5</b>	<b>1,676.1</b>	<b>\$191,326</b>	<b>\$1,283,220</b>	<b>\$171,174</b>	<b>\$1,112,045</b>	<b>5.8</b>	<b>1,588,305</b>

\* - 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).

# Harry Truman School



#	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>64,385</b>	<b>17.6</b>	<b>-11</b>	<b>\$8,709</b>	<b>\$41,012</b>	<b>\$7,699</b>	<b>\$33,313</b>	<b>3.8</b>	<b>63,605</b>
ECM 1	Install LED Fixtures	25,251	4.4	-2	\$3,432	\$19,775	\$2,215	\$17,560	5.1	25,155
ECM 2	Retrofit Fixtures with LED Lamps	39,134	13.2	-8	\$5,277	\$21,237	\$5,484	\$15,753	3.0	38,450
<b>Lighting Control Measures</b>		<b>9,678</b>	<b>3.2</b>	<b>-2</b>	<b>\$1,305</b>	<b>\$14,004</b>	<b>\$1,550</b>	<b>\$12,454</b>	<b>9.5</b>	<b>9,508</b>
ECM 3	Install Occupancy Sensor Lighting Controls	7,804	2.7	-2	\$1,052	\$11,204	\$1,550	\$9,654	9.2	7,667
ECM 4	Install High/Low Lighting Controls	1,874	0.5	0	\$253	\$2,800	\$0	\$2,800	11.1	1,841
<b>Motor Upgrades</b>		<b>1,445</b>	<b>0.7</b>	<b>0</b>	<b>\$198</b>	<b>\$6,857</b>	<b>\$0</b>	<b>\$6,857</b>	<b>34.7</b>	<b>1,455</b>
ECM 5	Premium Efficiency Motors	1,445	0.7	0	\$198	\$6,857	\$0	\$6,857	34.7	1,455
<b>Variable Frequency Drive (VFD) Measures</b>		<b>22,230</b>	<b>9.5</b>	<b>0</b>	<b>\$3,040</b>	<b>\$22,106</b>	<b>\$1,600</b>	<b>\$20,506</b>	<b>6.7</b>	<b>22,385</b>
ECM 6	Install VFDs on Constant Volume (CV) Fans	8,678	5.7	0	\$1,187	\$10,360	\$1,600	\$8,760	7.4	8,739
ECM 7	Install VFDs on Chilled Water Pumps	8,131	2.8	0	\$1,112	\$5,194	\$0	\$5,194	4.7	8,188
ECM 8	Install VFDs on Heating Water Pumps	5,421	1.0	0	\$741	\$6,552	\$0	\$6,552	8.8	5,459
<b>Electric Unitary HVAC Measures</b>		<b>415</b>	<b>0.5</b>	<b>0</b>	<b>\$57</b>	<b>\$4,355</b>	<b>\$0</b>	<b>\$4,355</b>	<b>76.8</b>	<b>418</b>
	Install High Efficiency Air Conditioning Units	415	0.5	0	\$57	\$4,355	\$0	\$4,355	76.8	418
<b>Electric Chiller Replacement</b>		<b>18,198</b>	<b>27.4</b>	<b>0</b>	<b>\$2,489</b>	<b>\$153,573</b>	<b>\$16,560</b>	<b>\$137,013</b>	<b>55.1</b>	<b>18,325</b>
	Install High Efficiency Chillers	18,198	27.4	0	\$2,489	\$153,573	\$16,560	\$137,013	55.1	18,325
<b>HVAC System Improvements</b>		<b>728</b>	<b>0.0</b>	<b>17</b>	<b>\$257</b>	<b>\$1,359</b>	<b>\$0</b>	<b>\$1,359</b>	<b>5.3</b>	<b>2,750</b>
ECM 9	Implement Demand Control Ventilation (DCV)	728	0.0	17	\$257	\$1,359	\$0	\$1,359	5.3	2,750
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>23</b>	<b>\$208</b>	<b>\$57</b>	<b>\$0</b>	<b>\$57</b>	<b>0.3</b>	<b>2,667</b>
ECM 10	Install Low-Flow DHW Devices	0	0.0	23	\$208	\$57	\$0	\$57	0.3	2,667
<b>Food Service &amp; Refrigeration Measures</b>		<b>2,595</b>	<b>0.3</b>	<b>0</b>	<b>\$355</b>	<b>\$1,747</b>	<b>\$50</b>	<b>\$1,697</b>	<b>4.8</b>	<b>2,613</b>
	Refrigerator/Freezer Case Electrically Commutated Motors	983	0.1	0	\$134	\$1,517	\$0	\$1,517	11.3	990
ECM 11	Vending Machine Control	1,612	0.2	0	\$220	\$230	\$50	\$180	0.8	1,623
<b>TOTALS</b>		<b>119,673</b>	<b>59.2</b>	<b>27</b>	<b>\$16,617</b>	<b>\$245,070</b>	<b>\$27,459</b>	<b>\$217,611</b>	<b>13.1</b>	<b>123,726</b>

\* - All incentives presented in this table are based on NJ SmartStart 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).

# Wilson School



#	Energy Conservation Measure	Recommend?	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>			<b>27,938</b>	<b>11.6</b>	<b>-8</b>	<b>\$3,319</b>	<b>\$49,789</b>	<b>\$22,910</b>	<b>\$5,219</b>	<b>\$17,691</b>	<b>5.3</b>	<b>27,175</b>
ECM 1	Install LED Fixtures	Yes	2,667	0.0	0	\$324	\$4,855	\$1,761	\$120	\$1,641	5.1	2,686
ECM 2	Retrofit Fixtures with LED Lamps	Yes	25,270	11.6	-8	\$2,996	\$44,934	\$21,149	\$5,099	\$16,050	5.4	24,489
<b>Lighting Control Measures</b>			<b>5,045</b>	<b>1.7</b>	<b>-2</b>	<b>\$598</b>	<b>\$4,784</b>	<b>\$9,076</b>	<b>\$1,000</b>	<b>\$8,076</b>	<b>13.5</b>	<b>4,889</b>
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	4,461	1.5	-1	\$529	\$4,230	\$7,676	\$1,000	\$6,676	12.6	4,323
ECM 4	Install High/Low Lighting Controls	Yes	584	0.2	0	\$69	\$554	\$1,400	\$0	\$1,400	20.2	566
<b>Motor Upgrades</b>			<b>1,089</b>	<b>0.5</b>	<b>0</b>	<b>\$132</b>	<b>\$1,982</b>	<b>\$7,235</b>	<b>\$0</b>	<b>\$7,235</b>	<b>54.8</b>	<b>1,096</b>
ECM 5	Premium Efficiency Motors	Yes	1,089	0.5	0	\$132	\$1,982	\$7,235	\$0	\$7,235	54.8	1,096
<b>Variable Frequency Drive (VFD) Measures</b>			<b>28,420</b>	<b>11.9</b>	<b>0</b>	<b>\$3,448</b>	<b>\$51,726</b>	<b>\$21,281</b>	<b>\$2,800</b>	<b>\$18,481</b>	<b>5.4</b>	<b>28,618</b>
ECM 6	Install VFDs on Constant Volume (CV) Fans	Yes	18,075	10.0	0	\$2,193	\$32,898	\$13,665	\$2,800	\$10,865	5.0	18,201
ECM 7	Install VFDs on Heating Water Pumps	Yes	10,345	1.9	0	\$1,255	\$18,829	\$7,616	\$0	\$7,616	6.1	10,417
<b>Electric Unitary HVAC Measures</b>			<b>82,801</b>	<b>6.4</b>	<b>0</b>	<b>\$10,047</b>	<b>\$150,706</b>	<b>\$42,609</b>	<b>\$2,136</b>	<b>\$40,473</b>	<b>4.0</b>	<b>83,380</b>
	Install High Efficiency Air Conditioning Units	No	7,069	4.1	0	\$858	\$12,867	\$17,894	\$951	\$16,944	19.8	7,119
ECM 8	Install High Efficiency Heat Pumps	Yes	75,732	2.3	0	\$9,189	\$137,840	\$24,714	\$1,185	\$23,529	2.6	76,262
<b>Gas Heating (HVAC/Process) Replacement</b>			<b>0</b>	<b>0.0</b>	<b>775</b>	<b>\$6,695</b>	<b>\$133,907</b>	<b>\$84,181</b>	<b>\$7,366</b>	<b>\$76,815</b>	<b>11.5</b>	<b>90,764</b>
ECM 9	Install High Efficiency Hot Water Boilers	Yes	0	0.0	609	\$5,262	\$105,240	\$63,945	\$7,366	\$56,579	10.8	71,333
	Install High Efficiency Furnaces	No	0	0.0	166	\$1,433	\$28,667	\$20,236	\$0	\$20,236	14.1	19,431
<b>Domestic Water Heating Upgrade</b>			<b>0</b>	<b>0.0</b>	<b>6</b>	<b>\$55</b>	<b>\$832</b>	<b>\$2,813</b>	<b>\$50</b>	<b>\$2,763</b>	<b>49.8</b>	<b>752</b>
	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	6	\$55	\$832	\$2,813	\$50	\$2,763	49.8	752
<b>Food Service &amp; Refrigeration Measures</b>			<b>7,969</b>	<b>0.9</b>	<b>0</b>	<b>\$967</b>	<b>\$10,234</b>	<b>\$8,002</b>	<b>\$0</b>	<b>\$8,002</b>	<b>8.3</b>	<b>8,025</b>
	Replace Refrigeration Equipment	No	6,357	0.7	0	\$771	\$9,257	\$7,772	\$0	\$7,772	10.1	6,402
ECM 10	Vending Machine Control	Yes	1,612	0.2	0	\$196	\$978	\$230	\$50	\$180	0.9	1,623
<b>TOTALS</b>			<b>153,262</b>	<b>33.1</b>	<b>772</b>	<b>\$25,263</b>	<b>\$403,962</b>	<b>\$198,105</b>	<b>\$18,570</b>	<b>\$179,535</b>	<b>7.1</b>	<b>244,700</b>

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

# Samsel Upper Elementary School



#	Energy Conservation Measure	Recommend?	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>			<b>211,013</b>	<b>56.8</b>	<b>-36</b>	<b>\$25,973</b>	<b>\$389,590</b>	<b>\$166,451</b>	<b>\$29,103</b>	<b>\$137,348</b>	<b>5.3</b>	<b>208,321</b>
ECM 1	Install LED Fixtures	Yes	40,779	0.0	0	\$5,079	\$76,181	\$36,582	\$3,635	\$32,947	6.5	41,064
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	62,298	19.6	-13	\$7,646	\$114,693	\$48,072	\$6,990	\$41,082	5.4	61,208
ECM 3	Retrofit Fixtures with LED Lamps	Yes	107,936	37.2	-23	\$13,248	\$198,716	\$81,797	\$18,478	\$63,319	4.8	106,048
<b>Lighting Control Measures</b>			<b>53,382</b>	<b>17.3</b>	<b>-11</b>	<b>\$6,552</b>	<b>\$52,416</b>	<b>\$55,520</b>	<b>\$5,900</b>	<b>\$49,620</b>	<b>7.6</b>	<b>52,449</b>
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	47,777	15.5	-10	\$5,864	\$46,912	\$48,720	\$5,900	\$42,820	7.3	46,941
ECM 5	Install High/Low Lighting Controls	Yes	5,605	1.8	-1	\$688	\$5,504	\$6,800	\$0	\$6,800	9.9	5,507
<b>Motor Upgrades</b>			<b>6,935</b>	<b>2.3</b>	<b>0</b>	<b>\$864</b>	<b>\$12,956</b>	<b>\$20,293</b>	<b>\$0</b>	<b>\$20,293</b>	<b>23.5</b>	<b>6,984</b>
	Premium Efficiency Motors	No	6,935	2.3	0	\$864	\$12,956	\$20,293	\$0	\$20,293	23.5	6,984
<b>Variable Frequency Drive (VFD) Measures</b>			<b>47,605</b>	<b>25.3</b>	<b>0</b>	<b>\$5,929</b>	<b>\$88,932</b>	<b>\$50,934</b>	<b>\$6,713</b>	<b>\$44,221</b>	<b>7.5</b>	<b>47,938</b>
	Install VFD on Variable Air Volume (VAV) Fans	No	4,811	3.3	0	\$599	\$8,987	\$10,159	\$2,713	\$7,446	12.4	4,844
	Install VFDs on Constant Volume (CV) Fans	No	21,155	14.3	0	\$2,635	\$39,521	\$22,043	\$4,000	\$18,043	6.8	21,303
ECM 6	Install VFDs on Heating Water Pumps	Yes	21,639	7.7	0	\$2,695	\$40,424	\$18,732	\$0	\$18,732	7.0	21,790
<b>Electric Unitary HVAC Measures</b>			<b>95,369</b>	<b>26.1</b>	<b>0</b>	<b>\$11,878</b>	<b>\$178,163</b>	<b>\$501,827</b>	<b>\$25,961</b>	<b>\$475,866</b>	<b>40.1</b>	<b>96,036</b>
	Install High Efficiency Air Conditioning Units	No	19,150	17.3	0	\$2,385	\$35,774	\$362,692	\$18,896	\$343,796	144.2	19,283
	Install High Efficiency Heat Pumps	No	76,220	8.8	0	\$9,493	\$142,389	\$139,134	\$7,065	\$132,070	13.9	76,753
<b>Domestic Water Heating Upgrade</b>			<b>0</b>	<b>0.0</b>	<b>43</b>	<b>\$375</b>	<b>\$5,631</b>	<b>\$19,994</b>	<b>\$698</b>	<b>\$19,296</b>	<b>51.4</b>	<b>5,090</b>
	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	43	\$375	\$5,631	\$19,994	\$698	\$19,296	51.4	5,090
<b>Food Service &amp; Refrigeration Measures</b>			<b>1,612</b>	<b>0.2</b>	<b>0</b>	<b>\$201</b>	<b>\$1,004</b>	<b>\$230</b>	<b>\$0</b>	<b>\$230</b>	<b>1.1</b>	<b>1,623</b>
ECM 7	Vending Machine Control	Yes	1,612	0.2	0	\$201	\$1,004	\$230	\$50	\$180	0.9	1,623
<b>TOTALS</b>			<b>415,917</b>	<b>127.9</b>	<b>203</b>	<b>\$53,549</b>	<b>\$764,249</b>	<b>\$855,986</b>	<b>\$71,174</b>	<b>\$784,812</b>	<b>14.7</b>	<b>442,545</b>

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# Sayreville Middle School



#	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>90,794</b>	<b>32.6</b>	<b>-22</b>	<b>\$11,442</b>	<b>\$171,626</b>	<b>\$83,921</b>	<b>\$17,642</b>	<b>\$66,279</b>	<b>5.8</b>	<b>88,911</b>
ECM 1	Install LED Fixtures	22,286	2.5	0	\$2,853	\$42,794	\$16,322	\$1,065	\$15,257	5.3	22,438
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,255	1.2	-1	\$282	\$4,237	\$1,956	\$355	\$1,601	5.7	2,185
ECM 3	Retrofit Fixtures with LED Lamps	66,254	28.9	-21	\$8,306	\$124,595	\$65,643	\$16,222	\$49,421	5.9	64,289
<b>Motor Upgrades</b>		<b>4,845</b>	<b>1.2</b>	<b>0</b>	<b>\$620</b>	<b>\$9,304</b>	<b>\$17,888</b>	<b>\$0</b>	<b>\$17,888</b>	<b>28.8</b>	<b>4,879</b>
ECM 4	Premium Efficiency Motors	4,845	1.2	0	\$620	\$9,304	\$17,888	\$0	\$17,888	28.8	4,879
<b>Variable Frequency Drive (VFD) Measures</b>		<b>108,379</b>	<b>16.5</b>	<b>0</b>	<b>\$13,876</b>	<b>\$208,133</b>	<b>\$52,961</b>	<b>\$2,320</b>	<b>\$50,641</b>	<b>3.6</b>	<b>109,137</b>
ECM 5	Install VFDs on Constant Volume (CV) Fans	25,451	8.3	0	\$3,258	\$48,876	\$22,126	\$2,320	\$19,806	6.1	25,629
ECM 6	Install VFDs on Heating Water Pumps	82,928	8.2	0	\$10,617	\$159,257	\$30,835	\$0	\$30,835	2.9	83,508
<b>Electric Unitary HVAC Measures</b>		<b>69,988</b>	<b>44.5</b>	<b>0</b>	<b>\$8,960</b>	<b>\$134,407</b>	<b>\$299,114</b>	<b>\$3,746</b>	<b>\$295,369</b>	<b>33.0</b>	<b>70,478</b>
	Install High Efficiency Air Conditioning Units	69,988	44.5	0	\$8,960	\$134,407	\$299,114	\$3,746	\$295,369	33.0	70,478
<b>Gas Heating (HVAC/Process) Replacement</b>		<b>0</b>	<b>0.0</b>	<b>1,026</b>	<b>\$8,708</b>	<b>\$174,169</b>	<b>\$206,979</b>	<b>\$1,600</b>	<b>\$205,379</b>	<b>23.6</b>	<b>120,134</b>
	Install High Efficiency Hot Water Boilers	0	0.0	987	\$8,378	\$167,552	\$192,003	\$400	\$191,603	22.9	115,570
	Install High Efficiency Furnaces	0	0.0	39	\$331	\$6,617	\$14,976	\$1,200	\$13,776	41.6	4,564
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>47</b>	<b>\$397</b>	<b>\$3,965</b>	<b>\$122</b>	<b>\$0</b>	<b>\$122</b>	<b>0.3</b>	<b>5,470</b>
ECM 7	Install Low-Flow DHW Devices	0	0.0	47	\$397	\$3,965	\$122	\$0	\$122	0.3	5,470
<b>Food Service &amp; Refrigeration Measures</b>		<b>8,006</b>	<b>0.8</b>	<b>0</b>	<b>\$1,025</b>	<b>\$9,422</b>	<b>\$2,667</b>	<b>\$115</b>	<b>\$2,552</b>	<b>2.5</b>	<b>8,062</b>
ECM 8	Refrigerator/Freezer Case Electrically Commutated Motors	1,311	0.2	0	\$168	\$2,517	\$303	\$40	\$263	1.6	1,320
ECM 9	Refrigeration Controls	1,860	0.1	0	\$238	\$3,810	\$1,674	\$75	\$1,599	6.7	1,873
ECM 10	Vending Machine Control	4,836	0.6	0	\$619	\$3,095	\$690	\$150	\$540	0.9	4,869
<b>TOTALS</b>		<b>282,012</b>	<b>95.5</b>	<b>1,051</b>	<b>\$45,028</b>	<b>\$711,027</b>	<b>\$663,652</b>	<b>\$25,423</b>	<b>\$638,230</b>	<b>14.2</b>	<b>407,071</b>

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

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

# Sayreville War Memorial High School



#	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>358,802</b>	<b>86.9</b>	<b>-75</b>	<b>\$45,907</b>	<b>\$688,599</b>	<b>\$294,320</b>	<b>\$41,486</b>	<b>\$252,834</b>	<b>5.5</b>	<b>352,582</b>
ECM 1	Install LED Fixtures	128,253	0.7	-1	\$16,643	\$249,640	\$147,783	\$6,980	\$140,803	8.5	129,076
ECM 2	Retrofit Fixtures with LED Lamps	230,549	86.3	-74	\$29,264	\$438,959	\$146,537	\$34,506	\$112,031	3.8	223,506
<b>Lighting Control Measures</b>		<b>10,424</b>	<b>2.9</b>	<b>-3</b>	<b>\$1,324</b>	<b>\$10,592</b>	<b>\$21,320</b>	<b>\$1,930</b>	<b>\$19,390</b>	<b>14.6</b>	<b>10,117</b>
ECM 3	Install Occupancy Sensor Lighting Controls	6,692	2.2	-2	\$849	\$6,794	\$15,320	\$1,930	\$13,390	15.8	6,485
ECM 4	Install Daylight Dimming Controls	412	0.0	0	\$53	\$428	\$400	\$0	\$400	7.5	415
ECM 5	Install High/Low Lighting Controls	3,320	0.7	-1	\$421	\$3,370	\$5,600	\$0	\$5,600	13.3	3,217
<b>Motor Upgrades</b>		<b>3,107</b>	<b>0.7</b>	<b>0</b>	<b>\$403</b>	<b>\$6,050</b>	<b>\$14,794</b>	<b>\$0</b>	<b>\$14,794</b>	<b>36.7</b>	<b>3,129</b>
ECM 6	Premium Efficiency Motors	3,107	0.7	0	\$403	\$6,050	\$14,794	\$0	\$14,794	36.7	3,129
<b>Variable Frequency Drive (VFD) Measures</b>		<b>75,229</b>	<b>21.6</b>	<b>0</b>	<b>\$9,765</b>	<b>\$146,480</b>	<b>\$46,956</b>	<b>\$6,040</b>	<b>\$40,916</b>	<b>4.2</b>	<b>75,755</b>
ECM 7	Install VFDs on Constant Volume (CV) Fans	75,229	21.6	0	\$9,765	\$146,480	\$46,956	\$6,040	\$40,916	4.2	75,755
<b>Electric Unitary HVAC Measures</b>		<b>98,285</b>	<b>47.6</b>	<b>0</b>	<b>\$12,758</b>	<b>\$191,372</b>	<b>\$470,428</b>	<b>\$10,749</b>	<b>\$459,679</b>	<b>36.0</b>	<b>98,972</b>
	Install High Efficiency Air Conditioning Units	81,432	45.3	0	\$10,571	\$158,558	\$422,689	\$8,152	\$414,537	39.2	82,001
	Install High Efficiency Heat Pumps	16,852	2.4	0	\$2,188	\$32,814	\$47,739	\$2,597	\$45,142	20.6	16,970
<b>Gas Heating (HVAC/Process) Replacement</b>		<b>0</b>	<b>0.0</b>	<b>1,551</b>	<b>\$13,916</b>	<b>\$278,321</b>	<b>\$360,703</b>	<b>\$10,000</b>	<b>\$350,703</b>	<b>25.2</b>	<b>181,605</b>
	Install High Efficiency Hot Water Boilers	0	0.0	1,085	\$9,739	\$194,780	\$214,790	\$0	\$214,790	22.1	127,094
	Install High Efficiency Furnaces	0	0.0	466	\$4,177	\$83,541	\$145,913	\$10,000	\$135,913	32.5	54,511
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>57</b>	<b>\$508</b>	<b>\$5,077</b>	<b>\$2,029</b>	<b>\$0</b>	<b>\$2,029</b>	<b>4.0</b>	<b>6,625</b>
ECM 8	Install Low-Flow DHW Devices	0	0.0	57	\$508	\$5,077	\$2,029	\$0	\$2,029	4.0	6,625
<b>Food Service &amp; Refrigeration Measures</b>		<b>4,230</b>	<b>0.5</b>	<b>0</b>	<b>\$549</b>	<b>\$3,660</b>	<b>\$2,576</b>	<b>\$0</b>	<b>\$2,576</b>	<b>4.7</b>	<b>4,260</b>
	Replace Refrigeration Equipment	1,007	0.1	0	\$131	\$1,568	\$2,116	\$0	\$2,116	16.2	1,014
ECM 9	Vending Machine Control	3,224	0.4	0	\$418	\$2,092	\$460	\$100	\$360	0.9	3,246
<b>TOTALS</b>		<b>550,077</b>	<b>160.3</b>	<b>1,530</b>	<b>\$85,130</b>	<b>\$1,330,150</b>	<b>\$1,213,126</b>	<b>\$70,205</b>	<b>\$1,142,921</b>	<b>13.4</b>	<b>733,045</b>

\* - All incentives presented in this table are based on NJ SmartStart 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).



# Emma L. Arleth School



#	Energy Conservation Measure	Recommend?	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>			<b>56,266</b>	<b>17.5</b>	<b>-15</b>	<b>\$7,063</b>	<b>\$105,946</b>	<b>\$45,506</b>	<b>\$8,090</b>	<b>\$37,416</b>	<b>5.3</b>	<b>54,901</b>
ECM 1	Install LED Fixtures	Yes	13,409	2.2	-1	\$1,704	\$25,556	\$13,644	\$965	\$12,679	7.4	13,366
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps	Yes	3,421	1.5	-1	\$428	\$6,417	\$3,301	\$480	\$2,821	6.6	3,315
ECM 3	Retrofit Fixtures with LED Lamps	Yes	39,435	13.7	-13	\$4,932	\$73,973	\$28,561	\$6,645	\$21,916	4.4	38,219
<b>Lighting Control Measures</b>			<b>3,981</b>	<b>1.0</b>	<b>-1</b>	<b>\$498</b>	<b>\$3,982</b>	<b>\$8,922</b>	<b>\$1,370</b>	<b>\$7,552</b>	<b>15.2</b>	<b>3,858</b>
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	2,688	0.7	-1	\$336	\$2,689	\$6,622	\$985	\$5,637	16.8	2,605
ECM 5	Install Daylight Dimming Controls	Yes	356	0.1	0	\$45	\$356	\$500	\$385	\$115	2.6	345
ECM 6	Install High/Low Lighting Controls	Yes	937	0.2	0	\$117	\$937	\$1,800	\$0	\$1,800	15.4	908
<b>Motor Upgrades</b>			<b>2,411</b>	<b>0.6</b>	<b>0</b>	<b>\$308</b>	<b>\$4,622</b>	<b>\$10,294</b>	<b>\$0</b>	<b>\$10,294</b>	<b>33.4</b>	<b>2,428</b>
ECM 7	Premium Efficiency Motors	Yes	2,411	0.6	0	\$308	\$4,622	\$10,294	\$0	\$10,294	33.4	2,428
<b>Variable Frequency Drive (VFD) Measures</b>			<b>36,498</b>	<b>9.5</b>	<b>0</b>	<b>\$4,664</b>	<b>\$69,966</b>	<b>\$33,671</b>	<b>\$3,360</b>	<b>\$30,311</b>	<b>6.5</b>	<b>36,753</b>
ECM 8	Install VFDs on Constant Volume (CV) Fans	Yes	28,459	8.1	0	\$3,637	\$54,555	\$26,458	\$3,360	\$23,098	6.4	28,658
ECM 9	Install VFDs on Heating Water Pumps	Yes	8,039	1.4	0	\$1,027	\$15,411	\$7,214	\$0	\$7,214	7.0	8,095
<b>Electric Unitary HVAC Measures</b>			<b>7,266</b>	<b>4.5</b>	<b>0</b>	<b>\$929</b>	<b>\$13,928</b>	<b>\$34,202</b>	<b>\$1,306</b>	<b>\$32,896</b>	<b>35.4</b>	<b>7,317</b>
	Install High Efficiency Air Conditioning Units	No	7,266	4.5	0	\$929	\$13,928	\$34,202	\$1,306	\$32,896	35.4	7,317
<b>Gas Heating (HVAC/Process) Replacement</b>			<b>0</b>	<b>0.0</b>	<b>995</b>	<b>\$8,455</b>	<b>\$169,097</b>	<b>\$99,870</b>	<b>\$11,504</b>	<b>\$88,367</b>	<b>10.5</b>	<b>116,527</b>
ECM 10	Install High Efficiency Hot Water Boilers	Yes	0	0.0	995	\$8,455	\$169,097	\$99,870	\$11,504	\$88,367	10.5	116,527
<b>HVAC System Improvements</b>			<b>0</b>	<b>0.0</b>	<b>12</b>	<b>\$99</b>	<b>\$1,088</b>	<b>\$220</b>	<b>\$0</b>	<b>\$220</b>	<b>2.2</b>	<b>1,363</b>
ECM 11	Install Pipe Insulation	Yes	0	0.0	12	\$99	\$1,088	\$220	\$0	\$220	2.2	1,363
<b>Domestic Water Heating Upgrade</b>			<b>0</b>	<b>0.0</b>	<b>46</b>	<b>\$388</b>	<b>\$3,884</b>	<b>\$122</b>	<b>\$0</b>	<b>\$122</b>	<b>0.3</b>	<b>5,353</b>
ECM 12	Install Low-Flow DHW Devices	Yes	0	0.0	46	\$388	\$3,884	\$122	\$0	\$122	0.3	5,353
<b>Food Service &amp; Refrigeration Measures</b>			<b>4,632</b>	<b>0.5</b>	<b>0</b>	<b>\$592</b>	<b>\$5,661</b>	<b>\$6,579</b>	<b>\$0</b>	<b>\$6,579</b>	<b>11.1</b>	<b>4,664</b>
	Replace Refrigeration Equipment	No	3,020	0.3	0	\$386	\$4,631	\$6,349	\$0	\$6,349	16.5	3,041
ECM 13	Vending Machine Control	Yes	1,612	0.2	0	\$206	\$1,030	\$230	\$50	\$180	0.9	1,623
<b>TOTALS</b>			<b>111,054</b>	<b>33.7</b>	<b>1,036</b>	<b>\$22,996</b>	<b>\$378,176</b>	<b>\$239,387</b>	<b>\$25,630</b>	<b>\$213,757</b>	<b>9.3</b>	<b>233,164</b>

\* - All incentives presented in this table are based on NJ SmartStart 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).

# Dwight D. Eisenhower School



#	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>39,899</b>	<b>9.9</b>	<b>-9</b>	<b>\$4,894</b>	<b>\$73,407</b>	<b>\$31,327</b>	<b>\$6,584</b>	<b>\$24,743</b>	<b>5.1</b>	<b>39,100</b>
ECM 1	Install LED Fixtures	11,484	0.1	0	\$1,433	\$21,500	\$9,495	\$775	\$8,720	6.1	11,565
ECM 2	Retrofit Fixtures with LED Lamps	28,414	9.8	-9	\$3,461	\$51,908	\$21,832	\$5,809	\$16,023	4.6	27,535
<b>Lighting Control Measures</b>		<b>6,719</b>	<b>2.2</b>	<b>-2</b>	<b>\$819</b>	<b>\$6,553</b>	<b>\$12,978</b>	<b>\$1,530</b>	<b>\$11,448</b>	<b>14.0</b>	<b>6,521</b>
ECM 3	Install Occupancy Sensor Lighting Controls	4,965	1.8	-2	\$605	\$4,838	\$11,688	\$1,530	\$10,158	16.8	4,812
ECM 4	Install Daylight Dimming Controls	254	0.0	0	\$32	\$254	\$90	\$0	\$90	2.8	256
ECM 5	Install High/Low Lighting Controls	1,500	0.4	0	\$183	\$1,461	\$1,200	\$0	\$1,200	6.6	1,453
<b>Motor Upgrades</b>		<b>264</b>	<b>0.1</b>	<b>0</b>	<b>\$33</b>	<b>\$493</b>	<b>\$2,763</b>	<b>\$0</b>	<b>\$2,763</b>	<b>84.0</b>	<b>265</b>
	Premium Efficiency Motors	264	0.1	0	\$33	\$493	\$2,763	\$0	\$2,763	84.0	265
<b>Variable Frequency Drive (VFD) Measures</b>		<b>6,552</b>	<b>1.4</b>	<b>0</b>	<b>\$818</b>	<b>\$12,265</b>	<b>\$9,828</b>	<b>\$0</b>	<b>\$9,828</b>	<b>12.0</b>	<b>6,598</b>
	Install VFDs on Heating Water Pumps	6,552	1.4	0	\$818	\$12,265	\$9,828	\$0	\$9,828	12.0	6,598
<b>Electric Unitary HVAC Measures</b>		<b>5,964</b>	<b>2.2</b>	<b>0</b>	<b>\$744</b>	<b>\$11,165</b>	<b>\$11,836</b>	<b>\$460</b>	<b>\$11,376</b>	<b>15.3</b>	<b>6,006</b>
	Install High Efficiency Air Conditioning Units	5,964	2.2	0	\$744	\$11,165	\$11,836	\$460	\$11,376	15.3	6,006
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>23</b>	<b>\$212</b>	<b>\$2,121</b>	<b>\$57</b>	<b>\$0</b>	<b>\$57</b>	<b>0.3</b>	<b>2,667</b>
ECM 6	Install Low-Flow DHW Devices	0	0.0	23	\$212	\$2,121	\$57	\$0	\$57	0.3	2,667
<b>Food Service &amp; Refrigeration Measures</b>		<b>5,551</b>	<b>0.6</b>	<b>0</b>	<b>\$693</b>	<b>\$6,905</b>	<b>\$8,755</b>	<b>\$125</b>	<b>\$8,630</b>	<b>12.5</b>	<b>5,589</b>
	Replace Refrigeration Equipment	3,939	0.4	0	\$492	\$5,899	\$8,525	\$125	\$8,400	17.1	3,966
ECM 7	Vending Machine Control	1,612	0.2	0	\$201	\$1,006	\$230	\$50	\$180	0.9	1,623
<b>TOTALS</b>		<b>64,948</b>	<b>16.5</b>	<b>11</b>	<b>\$8,213</b>	<b>\$112,910</b>	<b>\$77,544</b>	<b>\$8,699</b>	<b>\$68,845</b>	<b>8.4</b>	<b>66,745</b>

\* - All incentives presented in this table are based on NJ SmartStart 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).



# Selover School (BOE Offices)



#	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 <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>34,584</b>	<b>13.9</b>	<b>-6</b>	<b>\$4,724</b>	<b>\$70,861</b>	<b>\$20,567</b>	<b>\$4,562</b>	<b>\$16,005</b>	<b>3.4</b>	<b>34,121</b>
ECM 1	Install LED Fixtures	5,808	0.9	0	\$802	\$12,033	\$4,714	\$270	\$4,444	5.5	5,848
ECM 2	Retrofit Fixtures with LED Lamps	28,776	13.0	-6	\$3,922	\$58,827	\$15,853	\$4,292	\$11,561	2.9	28,273
<b>Lighting Control Measures</b>		<b>5,224</b>	<b>1.8</b>	<b>-1</b>	<b>\$712</b>	<b>\$5,696</b>	<b>\$6,892</b>	<b>\$670</b>	<b>\$6,222</b>	<b>8.7</b>	<b>5,133</b>
ECM 3	Install Occupancy Sensor Lighting Controls	4,009	1.4	-1	\$546	\$4,371	\$5,092	\$670	\$4,422	8.1	3,939
	Install High/Low Lighting Controls	1,215	0.4	0	\$166	\$1,325	\$1,800	\$0	\$1,800	10.9	1,194
<b>Electric Unitary HVAC Measures</b>		<b>4,309</b>	<b>4.1</b>	<b>0</b>	<b>\$595</b>	<b>\$8,927</b>	<b>\$25,992</b>	<b>\$184</b>	<b>\$25,808</b>	<b>43.4</b>	<b>4,339</b>
	Install High Efficiency Air Conditioning Units	4,309	4.1	0	\$595	\$8,927	\$25,992	\$184	\$25,808	43.4	4,339
<b>Gas Heating (HVAC/Process) Replacement</b>		<b>0</b>	<b>0.0</b>	<b>276</b>	<b>\$2,425</b>	<b>\$48,503</b>	<b>\$65,591</b>	<b>\$2,470</b>	<b>\$63,121</b>	<b>26.0</b>	<b>32,260</b>
	Install High Efficiency Steam Boilers	0	0.0	276	\$2,425	\$48,503	\$65,591	\$2,470	\$63,121	26.0	32,260
<b>HVAC System Improvements</b>		<b>2,813</b>	<b>0.0</b>	<b>20</b>	<b>\$569</b>	<b>\$6,257</b>	<b>\$440</b>	<b>\$0</b>	<b>\$440</b>	<b>0.8</b>	<b>5,230</b>
ECM 4	Install Pipe Insulation	2,813	0.0	20	\$569	\$6,257	\$440	\$0	\$440	0.8	5,230
<b>Domestic Water Heating Upgrade</b>		<b>0</b>	<b>0.0</b>	<b>33</b>	<b>\$292</b>	<b>\$3,144</b>	<b>\$1,582</b>	<b>\$600</b>	<b>\$982</b>	<b>3.4</b>	<b>3,885</b>
	Install Tankless Water Heater	0	0.0	3	\$22	\$447	\$1,503	\$600	\$903	40.4	297
ECM 5	Install Low-Flow DHW Devices	0	0.0	31	\$270	\$2,697	\$79	\$0	\$79	0.3	3,588
<b>Food Service &amp; Refrigeration Measures</b>		<b>1,612</b>	<b>0.2</b>	<b>0</b>	<b>\$223</b>	<b>\$1,113</b>	<b>\$230</b>	<b>\$0</b>	<b>\$230</b>	<b>1.0</b>	<b>1,623</b>
ECM 6	Vending Machine Control	1,612	0.2	0	\$223	\$1,113	\$230	\$50	\$180	0.8	1,623
<b>TOTALS</b>		<b>48,541</b>	<b>20.0</b>	<b>322</b>	<b>\$9,540</b>	<b>\$144,501</b>	<b>\$121,294</b>	<b>\$8,486</b>	<b>\$112,807</b>	<b>11.8</b>	<b>86,591</b>

\* - All incentives presented in this table are based on NJ SmartStart 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).

# Solar Energy Generation Potential



	Harry Truman School	Wilson School	Samsel Upper School	Middle School	High School	Emma Arleth School	Dwight D. Eisen. School	Selover School (BOE)
<i>Potential:</i>	High	High	High	High	High	High	Medium	None
<i>System Potential (kW):</i>	89	60	235	114	254	105	69	
<i>Electric Generation (kWh/yr):</i>	106,032	71,482	279,972	135,816	302,608	125,094	51,919	
<i>Estimated Displaced Cost:</i>	\$14,500	\$8,670	\$34,879	\$17,390	\$39,280	\$15,990	\$6,480	

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

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- 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

# SmartStart: Overview

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- 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!

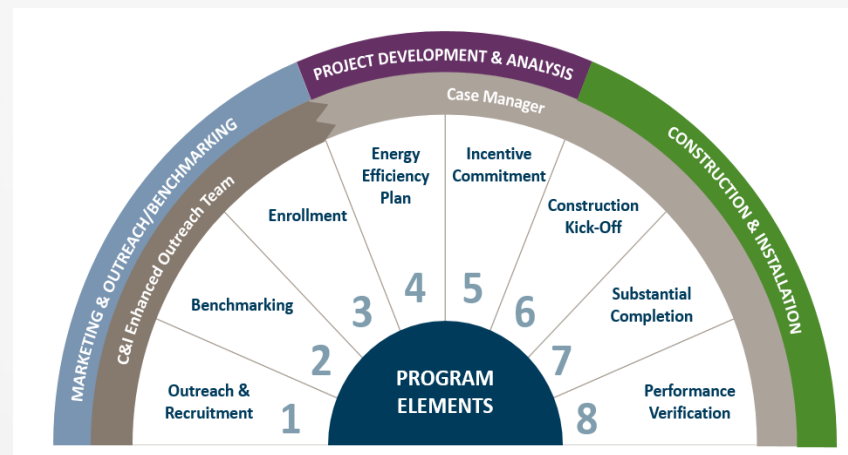
[www.NJCleanEnergy/SSB](http://www.NJCleanEnergy/SSB)

# 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. Ability to exceed is possible.



# Direct Install: Overview

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- 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  $\leq 200$  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)

# Direct Install:

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## Participating Contractor

**Tri-State Light & Energy, Inc.**

Alan Rhode

610-789-1900 x226

[asr@tsle.com](mailto:asr@tsle.com)



# Pay for Performance: Overview

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- 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

# 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

# CHP: OVERVIEW

## Combined Heat and Power (CHP)

- Enhanced alternative to emergency generators
- On-site power generation with recovery and productive use of waste heat
- System provides building heating and cooling
- Resiliency with Return on Investment
- Technology-neutral incentives
- 30/50/20 Incentive payment
  - 30% when equipment purchased
  - 50% when system installed
  - 20% upon acceptance and confirmation that the project is achieving the required performance

# Recommended NJCEP Incentives per Building



Sayreville Public Schools	SmartStart	CTEEP	Direct Install	Pay For Performance	Combined Heat & Power
Harry Truman School	X	X	X	X	X
Wilson School	X	X	X		
Samsel Upper Elementary School	X	X		X	
Sayreville Middle School	X	X		X	
Sayreville War Memorial HS	X	X		X	
Emma L. Arleth School	X	X	X		
Dwight D. Eisenhower School	X	X	X		
Selover School	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 1<sup>st</sup> 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

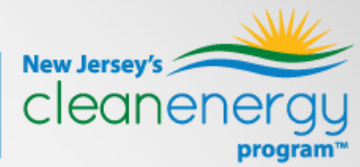
Cell: 732-330-2419

ESIP@bpu.nj.gov



# Questions

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# FOR MORE INFORMATION

**Visit** [NJCleanEnergy.com](http://NJCleanEnergy.com)

**Call** (866) NJSMART

**Jim Friedl**

Outreach Manager

732-855-6543

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