

# New Jersey's Clean Energy Program

LGEA Exit Meeting for:  
*Keansburg Board of Education*

Brian Dattellas, TRC

December 13, 2017

# Introductions

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- *Keansburg Board of Education*
  - Business Administrator: Dan Castles
  - Supervisor Bldgs & Grounds: Dave Cooney
- *NJ Clean Energy Program – TRC & BPU*
  - Auditor: Brian Dattellas
  - Outreach Manager: Jim Friedl
  - ESIP Coordinator: Mike Thulen

# Agenda

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- Overview of LGEA process
- Energy use & existing conditions
- Review of Energy Conservation Measures (ECMs) identified
- Questions or concerns regarding the draft audit report
- Overview of NJCEP equipment incentives
- Next steps for Keansburg Board of Education

# Process to Draft Report

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- Application submitted to NJCEP
- Site Visit Performed
- Utility Analysis
- Baseline Condition
- Analysis
- Recommendations
- Report

# *(1) Joseph R. Bolger Middle School*

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## **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

# (1) Joseph R. Bolger Middle School



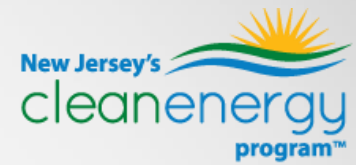
Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>			<b>223,720</b>	<b>36.4</b>	<b>0.0</b>	<b>\$17,834.04</b>	<b>\$150,375.72</b>	<b>\$15,715.00</b>	<b>\$134,660.72</b>	<b>7.6</b>	<b>225,284</b>
ECM 1	Install LED Fixtures	Yes	51,279	8.4	0.0	\$4,087.72	\$86,971.52	\$3,550.00	\$83,421.52	20.4	51,637
ECM 2	Retrofit Fixtures with LED Lamps	Yes	172,441	28.1	0.0	\$13,746.32	\$63,404.20	\$12,165.00	\$51,239.20	3.7	173,647
<b>Lighting Control Measures</b>			<b>2,354</b>	<b>0.4</b>	<b>0.0</b>	<b>\$187.65</b>	<b>\$1,044.00</b>	<b>\$180.00</b>	<b>\$864.00</b>	<b>4.6</b>	<b>2,370</b>
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	2,354	0.4	0.0	\$187.65	\$1,044.00	\$180.00	\$864.00	4.6	2,370
<b>Motor Upgrades</b>			<b>8,268</b>	<b>2.2</b>	<b>0.0</b>	<b>\$659.10</b>	<b>\$14,441.94</b>	<b>\$0.00</b>	<b>\$14,441.94</b>	<b>21.9</b>	<b>8,326</b>
ECM 4	Premium Efficiency Motors	Yes	8,268	2.2	0.0	\$659.10	\$14,441.94	\$0.00	\$14,441.94	21.9	8,326
<b>Gas Heating (HVAC/Process) Replacement</b>			<b>0</b>	<b>0.0</b>	<b>495.9</b>	<b>\$4,861.71</b>	<b>\$111,653.48</b>	<b>\$12,000.00</b>	<b>\$99,653.48</b>	<b>20.5</b>	<b>58,067</b>
ECM 5	Install High Efficiency Hot Water Boilers	Yes	0	0.0	495.9	\$4,861.71	\$111,653.48	\$12,000.00	\$99,653.48	20.5	58,067
<b>HVAC System Improvements</b>			<b>0</b>	<b>0.0</b>	<b>143.8</b>	<b>\$1,409.45</b>	<b>\$1,087.50</b>	<b>\$0.00</b>	<b>\$1,087.50</b>	<b>0.8</b>	<b>16,834</b>
ECM 6	Install Pipe Insulation	Yes	0	0.0	143.8	\$1,409.45	\$1,087.50	\$0.00	\$1,087.50	0.8	16,834
<b>Food Service Equipment &amp; Refrigeration Measures</b>			<b>49,855</b>	<b>14.2</b>	<b>0.0</b>	<b>\$3,974.25</b>	<b>\$26,683.59</b>	<b>\$1,000.00</b>	<b>\$25,683.59</b>	<b>6.5</b>	<b>50,204</b>
ECM 7	Food Service Equipment Replacement	Yes	49,855	14.2	0.0	\$3,974.25	\$26,683.59	\$1,000.00	\$25,683.59	6.5	50,204
<b>Plug Load Equipment Control - Vending Machine</b>			<b>11,041</b>	<b>0.0</b>	<b>0.0</b>	<b>\$880.15</b>	<b>\$2,300.00</b>	<b>\$0.00</b>	<b>\$2,300.00</b>	<b>2.6</b>	<b>11,118</b>
ECM 8	Vending Machine Control	Yes	11,041	0.0	0.0	\$880.15	\$2,300.00	\$0.00	\$2,300.00	2.6	11,118
<b>TOTALS</b>			<b>295,238</b>	<b>53.3</b>	<b>639.7</b>	<b>\$29,806.36</b>	<b>\$307,586.23</b>	<b>\$28,895.00</b>	<b>\$278,691.23</b>	<b>9.4</b>	<b>372,203</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).

## *(2) Keansburg High School*

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### **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

## (2) Keansburg High School



Energy Conservation Measure		Recommend?	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>			203,605	33.2	0.0	\$24,271.07	\$160,361.16	\$16,500.00	\$143,861.16	5.9	205,028
ECM 1	Install LED Fixtures	Yes	47,093	7.7	0.0	\$5,613.75	\$98,782.04	\$4,600.00	\$94,182.04	16.8	47,422
ECM 2	Retrofit Fixtures with LED Lamps	Yes	156,512	25.5	0.0	\$18,657.32	\$61,579.12	\$11,900.00	\$49,679.12	2.7	157,606
<b>Lighting Control Measures</b>			1,681	0.3	0.0	\$200.37	\$1,200.00	\$0.00	\$1,200.00	6.0	1,693
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	1,681	0.3	0.0	\$200.37	\$1,080.00	\$0.00	\$1,080.00	5.4	1,693
<b>Electric Unitary HVAC Measures</b>			16,089	9.5	0.0	\$1,917.86	\$81,692.73	\$3,748.50	\$77,944.23	40.6	16,201
ECM 4	Install High Efficiency Electric AC	Yes	15,289	9.1	0.0	\$1,822.53	\$74,990.89	\$3,521.00	\$71,469.89	39.2	15,396
ECM 5	Install High Efficiency Packaged Terminal AC/HP	Yes	800	0.5	0.0	\$95.33	\$6,701.84	\$227.50	\$6,474.34	67.9	805
<b>HVAC System Improvements</b>			5,820	1.3	0.0	\$693.74	\$2,000.00	\$750.00	\$1,250.00	1.8	5,860
ECM 6	Install Dual Enthalpy Outside Economizer Control	Yes	5,820	1.3	0.0	\$693.74	\$2,000.00	\$750.00	\$1,250.00	1.8	5,860
<b>Custom Measures</b>			2,168	0.0	730.7	\$7,346.19	\$263,465.00	\$0.00	\$263,465.00	35.9	87,744
ECM 7	Window Replacement	Yes	2,168	0.0	730.7	\$7,346.19	\$263,465.00	\$0.00	\$263,465.00	35.9	87,744
<b>TOTALS</b>			229,362	44.3	730.7	\$34,429.22	\$508,718.89	\$20,998.50	\$487,720.39	14.2	316,526

\* - 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).



## (2) Keansburg High School



### Window Replacement

The HS has single pane and double pane windows with wooden and aluminum frames. Approx. 65% of the windows are in very poor condition and show signs of excessive air infiltration.

Replacement will result in significant energy savings, primarily on the heating side.

Window replacements are major capital investments, therefore we recommend the district first explore options for replacement and maintenance before purchasing and installing.



# On-Site Generation

NJCEP evaluated on-site generation at the MS and HS and determined they both have high potential for installing photovoltaic (PV) arrays.

## Joseph R. Bolger Middle School

Analysis to the right includes both ground mount in space adjacent to the middle school and rooftop mounted panels.

*Photovoltaic Potential (MS)*

<b>Potential</b>	High	
<b>System Potential</b>	129	kW DC STC
<b>Electric Generation</b>	153,687	kWh/yr
<b>Displaced Cost</b>	\$13,370	/yr
<b>Installed Cost</b>	\$436,000	

## Keansburg High School

Analysis to the right includes rooftop mounted panels.

*Photovoltaic Potential (HS)*

<b>Potential</b>	High	
<b>System Potential</b>	54	kW DC STC
<b>Electric Generation</b>	64,334	kWh/yr
<b>Displaced Cost</b>	\$5,600	/yr
<b>Installed Cost</b>	\$140,400	



# *Some 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*

# PROGRAM PORTFOLIO



## ELIGIBLE SECTORS

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

## PROGRAMS

### Equipment Rebates:

- Retrofit – Existing Buildings
- New Construction
- Direct Install – Small Business
- Large Energy Users

### Whole Buildings:

- Pay for Performance Existing Buildings
- Pay for Performance New Construction

### Energy Generation:

- Combined Heat and Power (CHP) and Fuel Cells

# *Recommended NJCEP Incentives*

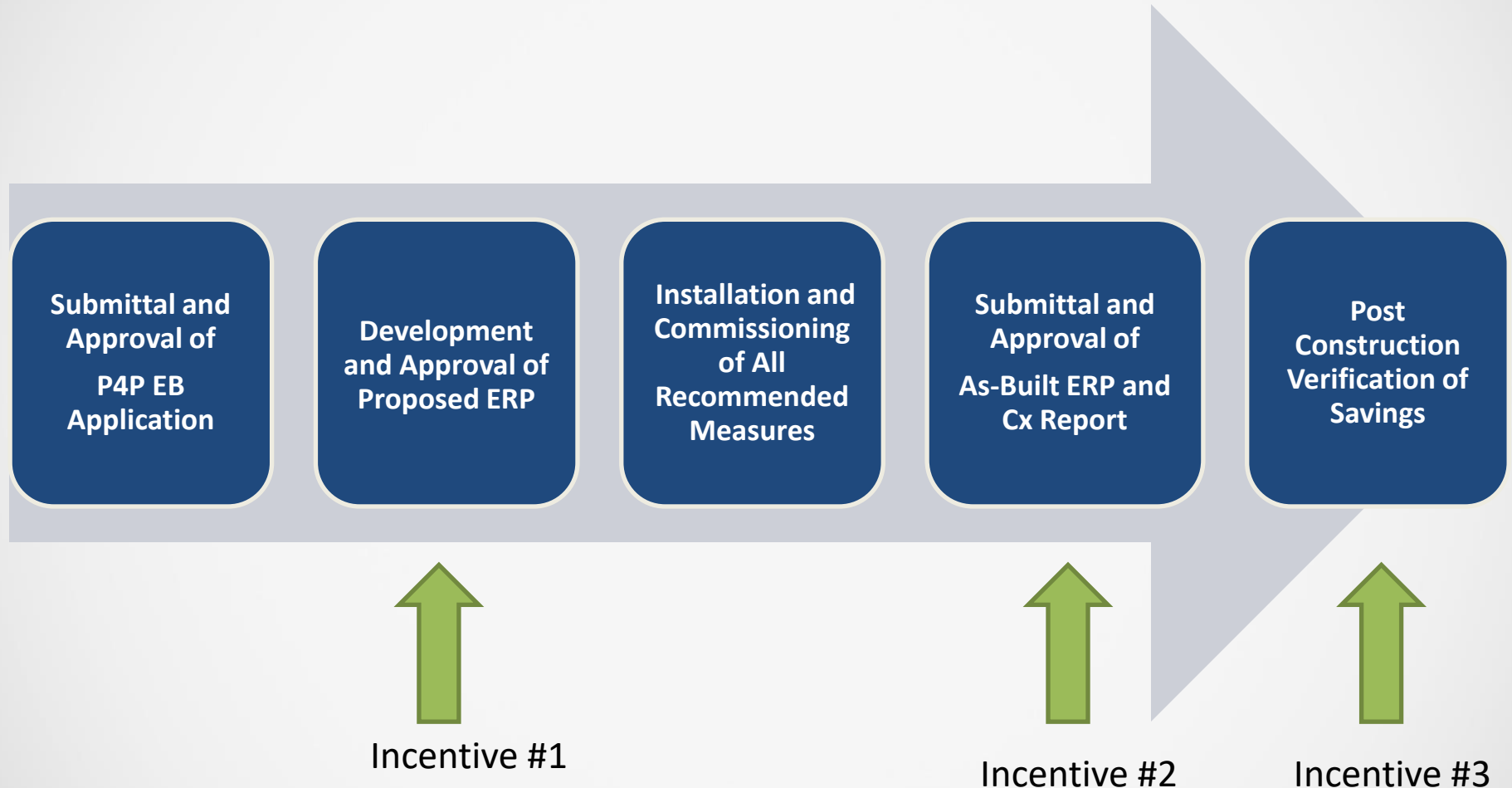
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- Pay for Performance (P4P)
- SmartStart Buildings (i.e Retrofit – Existing Buildings)



## *P4P – Existing Buildings (Process)*



# P4P – Existing Buildings (Incentives)



Incentive #1: Energy Reduction Plan			
Incentive Amount:		\$0.15	per sq ft
Minimum Incentive:		\$7,500	
Maximum Incentive:		\$50,000	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

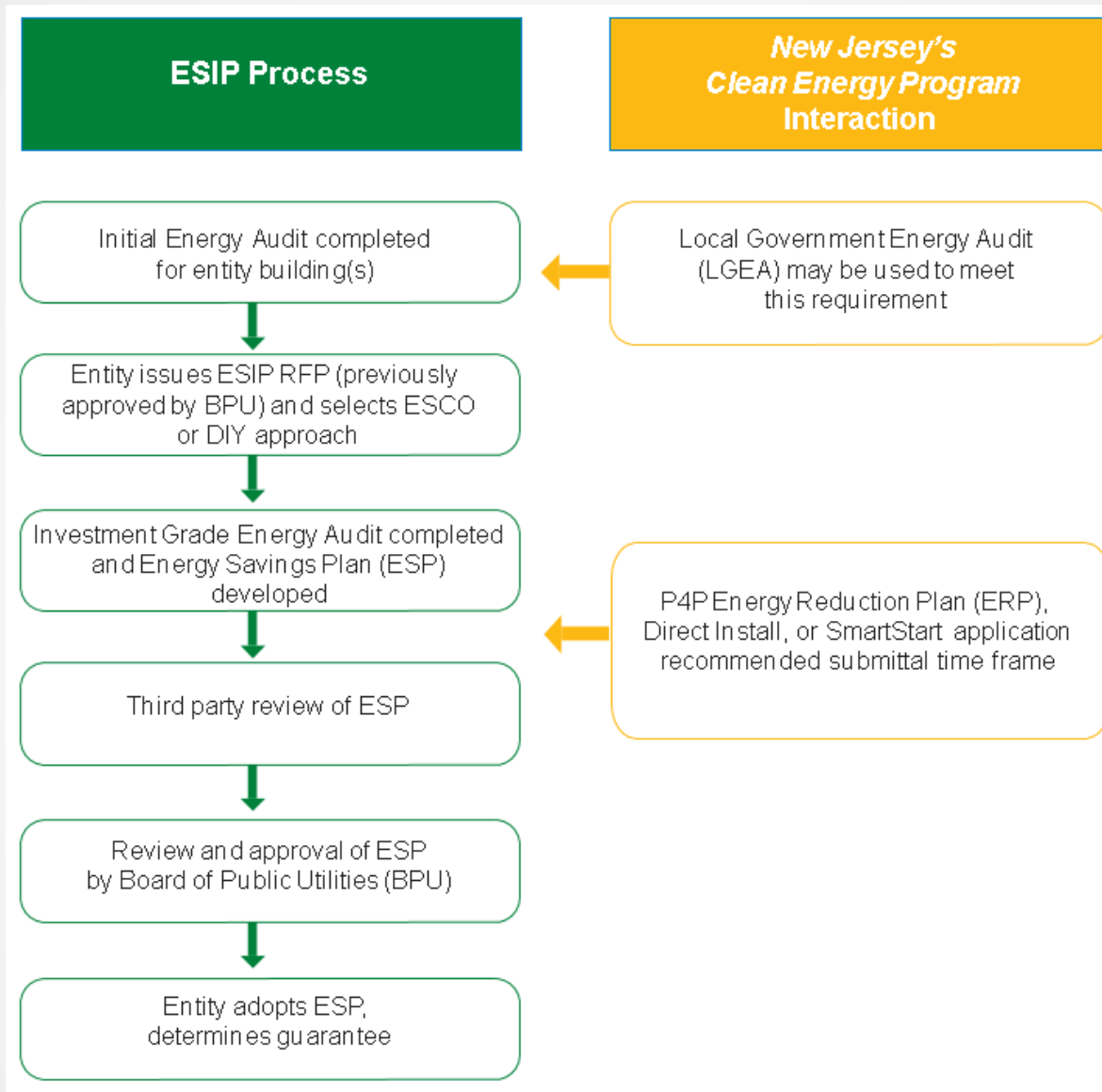
# *Energy Savings Improvement Program (ESIP)*

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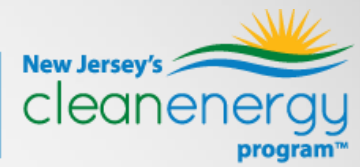
- Program administered directly by BPU
- Provides alternative financing for energy savings projects at public institutions.
- Value of energy savings leveraged to pay for cost of EE projects over a 15 year contract.
- Does not count as debt or require voter approval.
- Requires an audit as 1<sup>st</sup>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





# Questions

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# FOR MORE INFORMATION

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

**Call** (866) NJSMART

**Jim Friedl**

Outreach Manager

732-855-6543

[jfriedl@trcsolutions.com](mailto:jfriedl@trcsolutions.com)