



# New Jersey's Clean Energy Program

LGEA Exit Meeting for:

*Jackson Township Municipal  
Utilities Authority*

TRC

December 20, 2017

# Introductions

---



## Jackson Township MUA

- Executive Director: Dave Harpell
- Purchasing Agent: Carolann Weisel
- Clerk: Lindsay Brown

## NJ Clean Energy Program – TRC & BPU

- Auditors: Vish Nimbalkar  
Colman Snaith
- Program Manager: Brian DeLuca
- BPU Ombudsman: Gary Finger

# Agenda

---



- Overview of LGEA process
- Energy use & existing conditions
- Review of Energy Conservation Measures (ECMs) identified
- Discuss draft audit report comments
- Overview of NJCEP equipment incentives
- Next steps for Jackson Township MUA

# Process to Draft Report

---



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

# *Sites Audited*

---



- Administration Complex
- London Drive Water Treatment Plant
- Hyson Water Treatment Plant
- Wells & Pump Stations
  - Well #1
  - Well #6
  - Well #11
  - Dublin Road Pump Station
  - Cooks Bridge Pump Station
- Maple Glen Wastewater Treatment Plant



# Summary of Recommended ECMs

## All Sites Audited

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>75,835</b>	<b>18.8</b>	<b>0.0</b>	<b>\$7,696.11</b>	<b>\$52,843.56</b>	<b>\$5,865.00</b>	<b>\$46,978.56</b>	<b>6.1</b>	<b>76,365</b>
ECM 1	Install LED Fixtures	23,190	4.7	0.0	\$2,396.29	\$21,921.81	\$3,270.00	\$18,651.81	7.8	23,352
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	6,694	3.1	0.0	\$730.33	\$7,684.84	\$0.00	\$7,684.84	10.5	6,741
ECM 3	Retrofit Fixtures with LED Lamps	45,951	11.1	0.0	\$4,569.49	\$23,236.91	\$2,595.00	\$20,641.91	4.5	46,272
<b>Lighting Control Measures</b>		<b>1,802</b>	<b>0.4</b>	<b>0.0</b>	<b>\$189.04</b>	<b>\$1,740.00</b>	<b>\$300.00</b>	<b>\$1,440.00</b>	<b>7.6</b>	<b>1,815</b>
ECM 4	Install Occupancy Sensor Lighting Controls	1,802	0.4	0.0	\$189.04	\$1,740.00	\$300.00	\$1,440.00	7.6	1,815
<b>Motor Upgrades</b>		<b>24,097</b>	<b>5.9</b>	<b>0.0</b>	<b>\$1,906.38</b>	<b>\$60,311.77</b>	<b>\$0.00</b>	<b>\$60,311.77</b>	<b>31.6</b>	<b>24,266</b>
ECM 5	Premium Efficiency Motors	24,097	5.9	0.0	\$1,906.38	\$60,311.77	\$0.00	\$60,311.77	31.6	24,266
<b>Variable Frequency Drive (VFD) Measures</b>		<b>1,006,874</b>	<b>290.8</b>	<b>0.0</b>	<b>\$98,654.99</b>	<b>\$179,362.70</b>	<b>\$54,600.00</b>	<b>\$124,762.70</b>	<b>1.3</b>	<b>1,013,914</b>
ECM 6	Install VFDs on Well Pumps, Run Slower and Longer	975,919	287.2	0.0	\$95,172.33	\$164,149.10	\$54,600.00	\$109,549.10	1.2	982,743
ECM 7	Install VFDs on Blower Fans w/ DO Control	30,955	3.5	0.0	\$3,482.66	\$15,213.60	\$0.00	\$15,213.60	4.4	31,172
<b>Domestic Water Heating Upgrade</b>		<b>4,943</b>	<b>0.0</b>	<b>19.5</b>	<b>\$672.69</b>	<b>\$132.32</b>	<b>\$0.00</b>	<b>\$132.32</b>	<b>0.2</b>	<b>7,260</b>
ECM 8	Install Low-Flow Domestic Hot Water Devices	4,943	0.0	19.5	\$672.69	\$132.32	\$0.00	\$132.32	0.2	7,260
<b>TOTALS</b>		<b>1,113,551</b>	<b>315.9</b>	<b>19.5</b>	<b>\$109,119.21</b>	<b>\$294,390.35</b>	<b>\$60,765.00</b>	<b>\$233,625.35</b>	<b>2.1</b>	<b>1,123,619</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).

# *(1) Administration Complex*

---



## **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) Administration Complex



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>15,700</b>	<b>5.4</b>	<b>0.0</b>	<b>\$1,708.47</b>	<b>\$13,240.17</b>	<b>\$980.00</b>	<b>\$12,260.17</b>	<b>7.18</b>	<b>15,809</b>
ECM 1	Install LED Fixtures	Yes	2,023	0.4	0.0	\$220.18	\$4,259.33	\$450.00	\$3,809.33	17.30	2,037
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	5,819	2.4	0.0	\$633.26	\$6,084.00	\$0.00	\$6,084.00	9.61	5,860
ECM 3	Retrofit Fixtures with LED Lamps	Yes	7,857	2.5	0.0	\$855.02	\$2,896.84	\$530.00	\$2,366.84	2.77	7,912
<b>Lighting Control Measures</b>			<b>265</b>	<b>0.1</b>	<b>0.0</b>	<b>\$28.80</b>	<b>\$1,160.00</b>	<b>\$200.00</b>	<b>\$960.00</b>	<b>33.33</b>	<b>267</b>
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	265	0.1	0.0	\$28.80	\$1,160.00	\$200.00	\$960.00	33.33	267
<b>Variable Frequency Drive (VFD) Measures</b>			<b>202,850</b>	<b>48.7</b>	<b>0.0</b>	<b>\$22,074.61</b>	<b>\$5,000.00</b>	<b>\$0.00</b>	<b>\$5,000.00</b>	<b>0.23</b>	<b>204,269</b>
ECM 5	Run Pump Slower and Longer	Yes	202,850	48.7	0.0	\$22,074.61	\$5,000.00	\$0.00	\$5,000.00	0.23	204,269
<b>Domestic Water Heating Upgrade</b>			<b>1,202</b>	<b>0.0</b>	<b>19.5</b>	<b>\$251.84</b>	<b>\$35.85</b>	<b>\$0.00</b>	<b>\$35.85</b>	<b>0.14</b>	<b>3,493</b>
ECM 6	Install Low-Flow Domestic Hot Water Devices	Yes	1,202	0.0	19.5	\$251.84	\$35.85	\$0.00	\$35.85	0.14	3,493
<b>TOTALS</b>			<b>220,017</b>	<b>54.2</b>	<b>19.5</b>	<b>\$24,063.72</b>	<b>\$19,436.02</b>	<b>\$1,180.00</b>	<b>\$18,256.02</b>	<b>0.76</b>	<b>223,837</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) London Drive Water Treatment Plant*

---



### **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) London Drive Water Treatment Plant



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>22,718</b>	<b>5.9</b>	<b>0.0</b>	<b>\$2,486.31</b>	<b>\$11,916.24</b>	<b>\$1,655.00</b>	<b>\$10,261.24</b>	<b>4.13</b>	<b>22,876</b>
ECM 1	Install LED Fixtures	Yes	4,260	1.0	0.0	\$466.28	\$4,643.98	\$820.00	\$3,823.98	8.20	4,290
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	555	0.2	0.0	\$60.71	\$468.00	\$0.00	\$468.00	7.71	559
ECM 3	Retrofit Fixtures with LED Lamps	Yes	17,902	4.8	0.0	\$1,959.32	\$6,804.27	\$835.00	\$5,969.27	3.05	18,028
<b>Lighting Control Measures</b>			<b>1,323</b>	<b>0.2</b>	<b>0.0</b>	<b>\$144.76</b>	<b>\$464.00</b>	<b>\$80.00</b>	<b>\$384.00</b>	<b>2.65</b>	<b>1,332</b>
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	1,323	0.2	0.0	\$144.76	\$464.00	\$80.00	\$384.00	2.65	1,332
<b>Variable Frequency Drive (VFD) Measures</b>			<b>193,901</b>	<b>55.4</b>	<b>0.0</b>	<b>\$21,221.35</b>	<b>\$32,160.60</b>	<b>\$12,000.00</b>	<b>\$20,160.60</b>	<b>0.95</b>	<b>195,257</b>
ECM 5	Install VFDs on Well Pumps, Run Slower and Longer	Yes	193,901	55.4	0.0	\$21,221.35	\$32,160.60	\$12,000.00	\$20,160.60	0.95	195,257
<b>TOTALS</b>			<b>217,941</b>	<b>61.5</b>	<b>0.0</b>	<b>\$23,852.42</b>	<b>\$44,540.84</b>	<b>\$13,735.00</b>	<b>\$30,805.84</b>	<b>1.29</b>	<b>219,465</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).

## *(3) Hyson Water Treatment Plant*

---



### **Overview of Systems, Baseline & Existing Conditions:**

- Building Envelope
- Lighting System
- HVAC and Mechanical Systems
- Photovoltaic (PV) ground-mounted system

### **Utility Consumption:**

- Electric Consumption and Costs

# (3) Hyson Water Treatment Plant



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>19,116</b>	<b>3.5</b>	<b>0.0</b>	<b>\$1,378.56</b>	<b>\$9,439.01</b>	<b>\$2,070.00</b>	<b>\$7,369.01</b>	<b>5.35</b>	<b>19,249</b>
ECM 1	Install LED Fixtures	Yes	5,903	1.5	0.0	\$425.72	\$5,078.80	\$1,300.00	\$3,778.80	8.88	5,945
ECM 2	Retrofit Fixtures with LED Lamps	Yes	13,212	2.1	0.0	\$952.83	\$4,360.21	\$770.00	\$3,590.21	3.77	13,305
<b>Lighting Control Measures</b>			<b>215</b>	<b>0.1</b>	<b>0.0</b>	<b>\$15.48</b>	<b>\$116.00</b>	<b>\$20.00</b>	<b>\$96.00</b>	<b>6.20</b>	<b>216</b>
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	215	0.1	0.0	\$15.48	\$116.00	\$20.00	\$96.00	6.20	216
<b>Motor Upgrades</b>			<b>20,120</b>	<b>5.5</b>	<b>0.0</b>	<b>\$1,451.02</b>	<b>\$54,258.15</b>	<b>\$0.00</b>	<b>\$54,258.15</b>	<b>37.39</b>	<b>20,261</b>
ECM 4	Premium Efficiency Motors	Yes	20,120	5.5	0.0	\$1,451.02	\$54,258.15	\$0.00	\$54,258.15	37.39	20,261
<b>Variable Frequency Drive (VFD) Measures</b>			<b>352,453</b>	<b>151.6</b>	<b>0.0</b>	<b>\$25,417.58</b>	<b>\$96,481.80</b>	<b>\$36,000.00</b>	<b>\$60,481.80</b>	<b>2.38</b>	<b>354,917</b>
ECM 5	Install VFDs on Well Pumps, Run Slower and Longer	Yes	352,453	151.6	0.0	\$25,417.58	\$96,481.80	\$36,000.00	\$60,481.80	2.38	354,917
<b>TOTALS</b>			<b>391,903</b>	<b>160.7</b>	<b>0.0</b>	<b>\$28,262.64</b>	<b>\$160,294.96</b>	<b>\$38,090.00</b>	<b>\$122,204.96</b>	<b>4.32</b>	<b>394,644</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).

## *(4) Wells & Pump Stations*

---



### **Overview of Systems, Baseline & Existing Conditions:**

- Building Envelope
- Lighting System
- HVAC and Mechanical Systems

### **Utility Consumption:**

- Electric Consumption and Costs

# (4) Wells & Pump Stations

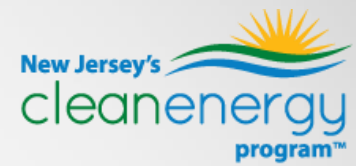


Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>			<b>15,179</b>	<b>2.9</b>	<b>0.0</b>	<b>\$1,771.45</b>	<b>\$17,045.46</b>	<b>\$1,050.00</b>	<b>\$15,995.46</b>	<b>9.03</b>	<b>15,285</b>
ECM 1	Install LED Fixtures	Yes	11,003	1.8	0.0	\$1,284.11	\$7,939.70	\$700.00	\$7,239.70	5.64	11,080
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	84	0.0	0.0	\$9.81	\$323.67	\$0.00	\$323.67	32.98	85
ECM 3	Retrofit Fixtures with LED Lamps	Yes	4,092	1.1	0.0	\$477.52	\$8,782.10	\$350.00	\$8,432.10	17.66	4,120
<b>Motor Upgrades</b>			<b>1,892</b>	<b>0.2</b>	<b>0.0</b>	<b>\$220.80</b>	<b>\$4,206.90</b>	<b>\$0.00</b>	<b>\$4,206.90</b>	<b>19.05</b>	<b>1,905</b>
ECM 4	Premium Efficiency Motors	Yes	1,892	0.2	0.0	\$220.80	\$4,206.90	\$0.00	\$4,206.90	19.05	1,905
<b>Variable Frequency Drive (VFD) Measures</b>			<b>226,715</b>	<b>31.5</b>	<b>0.0</b>	<b>\$26,458.79</b>	<b>\$30,506.70</b>	<b>\$6,600.00</b>	<b>\$23,906.70</b>	<b>0.90</b>	<b>228,300</b>
ECM 5	Install VFDs on Well Pumps, Run Slower and Longer	Yes	226,715	31.5	0.0	\$26,458.79	\$30,506.70	\$6,600.00	\$23,906.70	0.90	228,300
<b>TOTALS</b>			<b>243,786</b>	<b>34.7</b>	<b>0.0</b>	<b>\$28,451.05</b>	<b>\$51,759.06</b>	<b>\$7,650.00</b>	<b>\$44,109.06</b>	<b>1.55</b>	<b>245,491</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).

## *(5) Maple Glen Wastewater Treatment Plant*



### **Overview of Systems, Baseline & Existing Conditions:**

- Building Envelope
- Lighting System
- HVAC and Mechanical Systems

### **Utility Consumption:**

- Electric Consumption and Costs

# (5) Maple Glen Wastewater Treatment Plant



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>3,123</b>	<b>1.1</b>	<b>0.0</b>	<b>\$351.35</b>	<b>\$1,202.66</b>	<b>\$110.00</b>	<b>\$1,092.66</b>	<b>3.11</b>	<b>3,145</b>
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	236	0.4	0.0	\$26.55	\$809.17	\$0.00	\$809.17	30.48	238
ECM 2	Retrofit Fixtures with LED Lamps	Yes	2,887	0.7	0.0	\$324.80	\$393.49	\$110.00	\$283.49	0.87	2,907
<b>Motor Upgrades</b>			<b>2,085</b>	<b>0.2</b>	<b>0.0</b>	<b>\$234.56</b>	<b>\$1,846.72</b>	<b>\$0.00</b>	<b>\$1,846.72</b>	<b>7.87</b>	<b>2,099</b>
ECM 3	Premium Efficiency Motors	Yes	2,085	0.2	0.0	\$234.56	\$1,846.72	\$0.00	\$1,846.72	7.87	2,099
<b>Variable Frequency Drive (VFD) Measures</b>			<b>30,955</b>	<b>3.5</b>	<b>0.0</b>	<b>\$3,482.66</b>	<b>\$15,213.60</b>	<b>\$0.00</b>	<b>\$15,213.60</b>	<b>4.37</b>	<b>31,172</b>
ECM 4	Install VFDs on Blower Fans w/ DO Control	Yes	30,955	3.5	0.0	\$3,482.66	\$15,213.60	\$0.00	\$15,213.60	4.37	31,172
<b>Domestic Water Heating Upgrade</b>			<b>3,741</b>	<b>0.0</b>	<b>0.0</b>	<b>\$420.85</b>	<b>\$96.47</b>	<b>\$0.00</b>	<b>\$96.47</b>	<b>0.23</b>	<b>3,767</b>
ECM 5	Install Low-Flow Domestic Hot Water Devices	Yes	3,741	0.0	0.0	\$420.85	\$96.47	\$0.00	\$96.47	0.23	3,767
<b>TOTALS</b>			<b>39,904</b>	<b>4.8</b>	<b>0.0</b>	<b>\$4,489.42</b>	<b>\$18,359.45</b>	<b>\$110.00</b>	<b>\$18,249.45</b>	<b>4.06</b>	<b>40,183</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).



# Draft Report Comments Received from MUA



- General comments will be addressed in all final reports
- Building-specific comments summarized below:
  - Administration Complex
    - Operating hours correction in text
    - VFD type correction
  - London Drive Water Treatment Plant
    - Operating hours correction in calculations
  - Hyson Water Treatment Plant
    - Operating hours correction in calculations
  - Wells & Pump Stations
    - Pump type correction (Dublin Road Pump Station)



# *Some Energy Efficient Best Practices*

---

- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- 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

---



- SmartStart Buildings (i.e Retrofit – Existing Buildings)
  - Prescriptive – All sites are eligible
  - Custom
    - Hyson Water Treatment Plant – ECM 5
    - London Drive Water Treatment Plant – ECM 5
    - Wells & Pump Stations – ECM 5

# SMARTSTART: OVERVIEW

---



- Individual incentives for broad project categories
- Available to all Commercial, Industrial, Agricultural, Government, Non-Profit and Institutional customers
- Provides two types of financial incentives for high efficiency equipment installation: **Prescriptive & Custom**
- Incentives up to \$500,000 per electric account and \$500,000 per natural gas account per fiscal year.

# SMARTSTART: INCENTIVES

---



## Prescriptive Incentives

- Specific incentives and individual applications for:
  - Lighting & Lighting Controls
  - Packed HVAC
  - Boilers & Water Heaters
  - Chillers
  - VFD's
  - Food Service
  - Refrigeration
- Project pre-approval required for all lighting measures

# SMARTSTART: INCENTIVES



## Custom Incentives – Pre-approval required

- Designed for new or innovative technologies proven to be cost-effective and not listed as prescriptive
- Incentives paid for approved projects at the lesser of three values\*:
  - 50% of project cost
  - Buy down to one year payback, OR
  - \$0.16/kWh, \$1.60/ therm saved in first year
- Projects must have a minimum first year energy savings of 75,000 kWh or 1,500 therms to be eligible.
- Project pre and post inspection required.

\* For equipment replacement, gut-rehab/new construction, incentives caps based on incremental cost and energy savings where applicable.

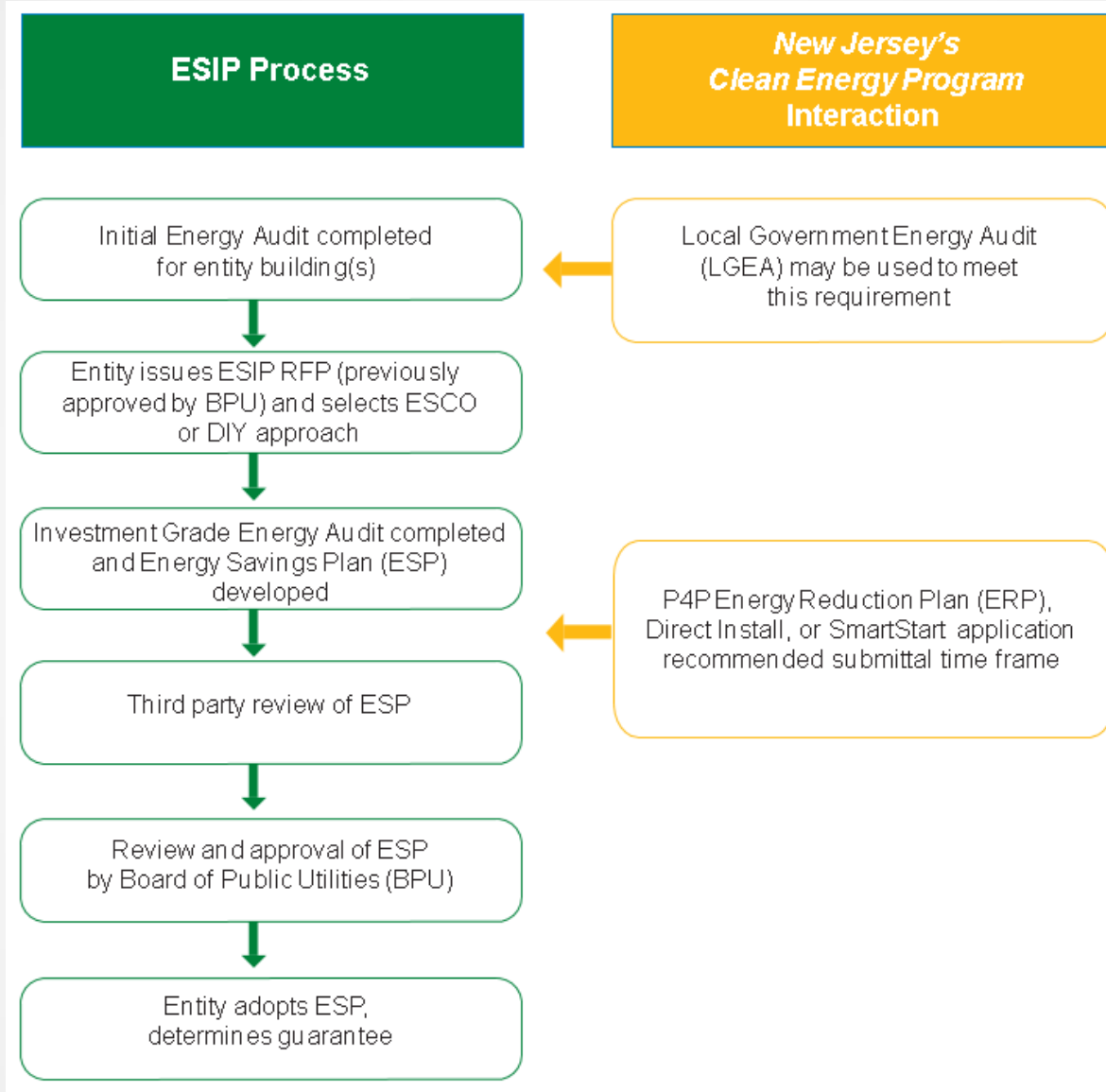
# *Energy Savings Improvement Program (ESIP)*

---



- 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

---



?



# 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)