# *LGEA Presentation*

## *DHS – Green Brook Regional Center*

September 26, 2023

New Jersey's
Clean Energy Program

*Lighting the way to New Jersey's Clean Energy Future*

# INTRODUCTIONS

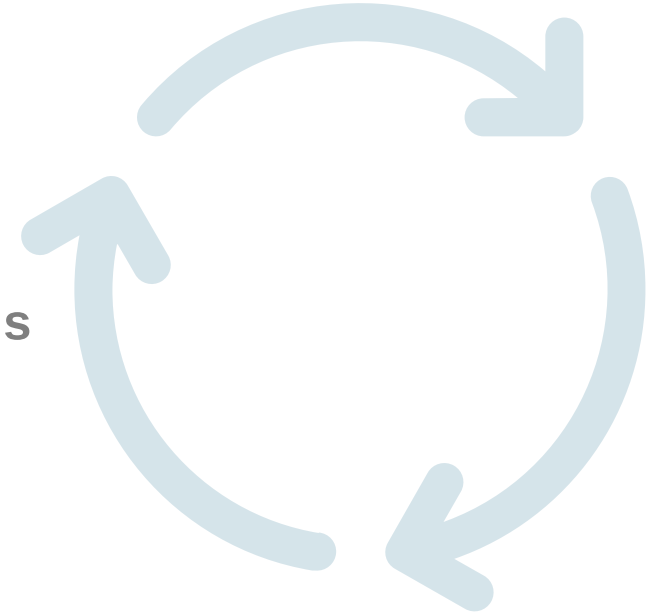
- *State of New Jersey - DHS*
  - Christian Casteel
  - Ripenrai Nagar
  - Falguni Mittal
  - Thomas Fiedler
  - Micki Pomykala
- *New Jersey BPU*
  - Sara Bluhm
  - Yuliia Herhel
- *NJ Clean Energy Program*
  - Sarah Walters
  - Moussa Traore
  - Eduardo Garcia

# AGENDA

- The audit process overview
- Energy use & existing conditions
- Review of **E**nergy **C**onservation **M**easures (ECMs) identified & other recommendations
- Energy Savings Improvement Program (ESIP)
- Energy Efficiency Incentive Programs
- Questions regarding the draft audit report
- Next steps for DHS – Green Brook Regional Center

# LGEA Process

- Application Approval
- Initial Call
- Facility Interviews
- Audit
- Benchmarking & Analysis
- Draft Reports
- LGEA Presentation
- Final Reports



New Jersey's cleanenergy program™

# GREEN BROOK REGIONAL CENTER

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

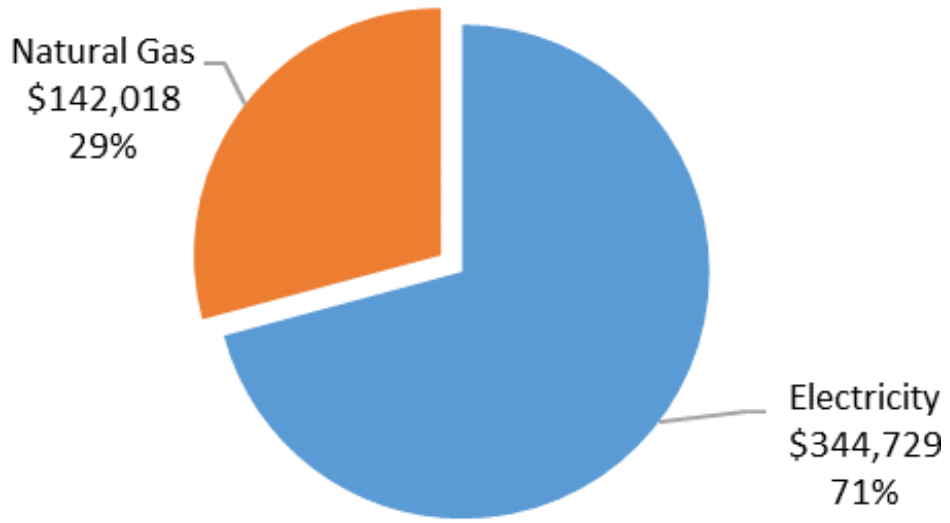
- Building Envelope
- Lighting System
- HVAC and Mechanical Systems
- Plug Load Equipment
- Cooking & Refrigeration Equipment

**Utility Consumption:**

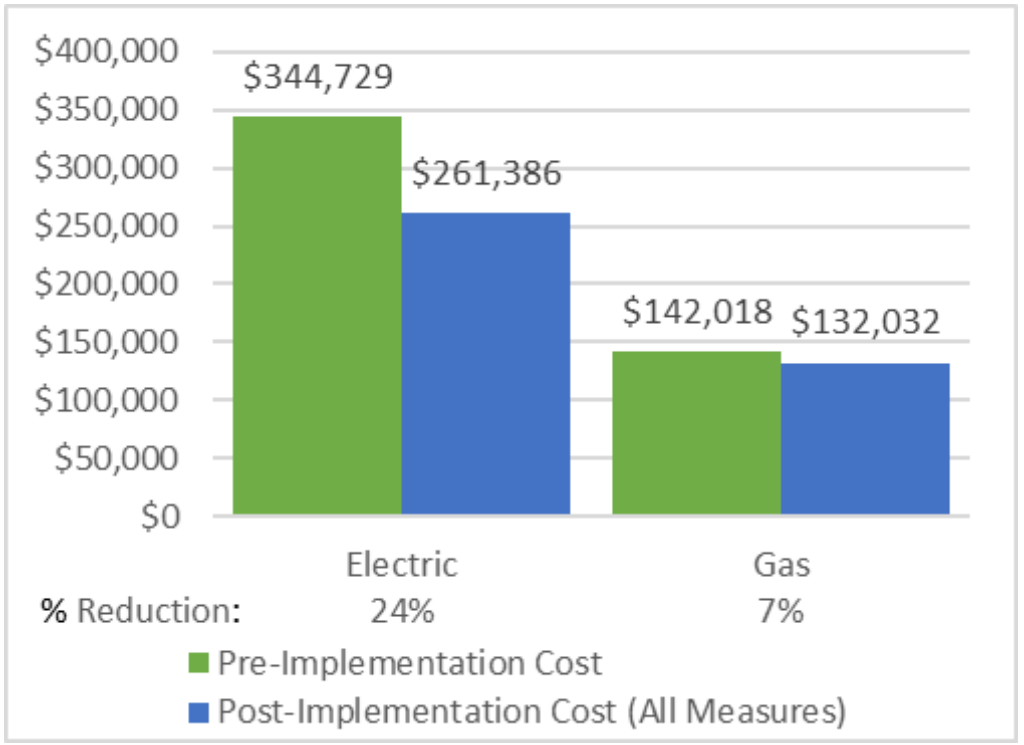
- Electric Consumption and Costs
- Natural Gas Consumption and Costs

# Utility Breakout

Percent of Total Annual Energy Costs




Pre & Post Implementation Cost



# BENCHMARKING

LEARN MORE AT energystar.gov

## ENERGY STAR® Statement of Energy Performance

**N/A**

ENERGY STAR® Score[1]

**DHS - Green Brook Regional Center**

**Primary Property Type:** Residential Care Facility
**Gross Floor Area (ft²):** 145,000
**Built:** 1964

**For Year Ending:** December 31, 2022
**Date Generated:** July 25, 2023

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

### Property & Contact Information

| Property Address | Property Owner | Primary Contact |
|---|---|---|
| DHS - Green Brook Regional Center<br>275 Green Brook Road<br>Green Brook, New Jersey 08812 | State of New Jersey<br>428 East State Street<br>Trenton, NJ 08625<br>(609) 940-4129 | New Jersey Board of Public Utilities State Energy Services<br>44 South Clinton Ave<br>Trenton, NJ 08625<br>6096339666<br>BPU.EnergyServices@bpu.nj.gov |

**Property ID:** 25426936

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

**Site EUI**
163.5 kBtu/ft²

**Source EUI**
271.8 kBtu/ft²

**Annual Energy by Fuel**

| | |
|---|---|
| Natural Gas (kBtu) | 15,404,794 (65%) |
| Electric - Grid (kBtu) | 8,299,066 (35%) |

**National Median Comparison**

| | |
|---|---|
| National Median Site EUI (kBtu/ft²) | 64.7 |
| National Median Source EUI (kBtu/ft²) | 107.5 |
| % Diff from National Median Source EUI | 153% |

**Annual Emissions**

| | |
|---|---|
| Total (Location-Based) GHG Emissions (Metric Tons CO2e/year) | 1,541 |

### Signature & Stamp of Verifying Professional

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

LP Signature: _____ Date: _____

**Licensed Professional**

___ _____
,
(___)___-_____
_____

**Professional Engineer or Registered Architect Stamp (if applicable)**

**Site EUI**
163.5 kBtu/ft²

**Source EUI**
271.8 kBtu/ft²

**National Median Comparison**

| | |
|---|---|
| National Median Site EUI (kBtu/ft²) | 64.7 |
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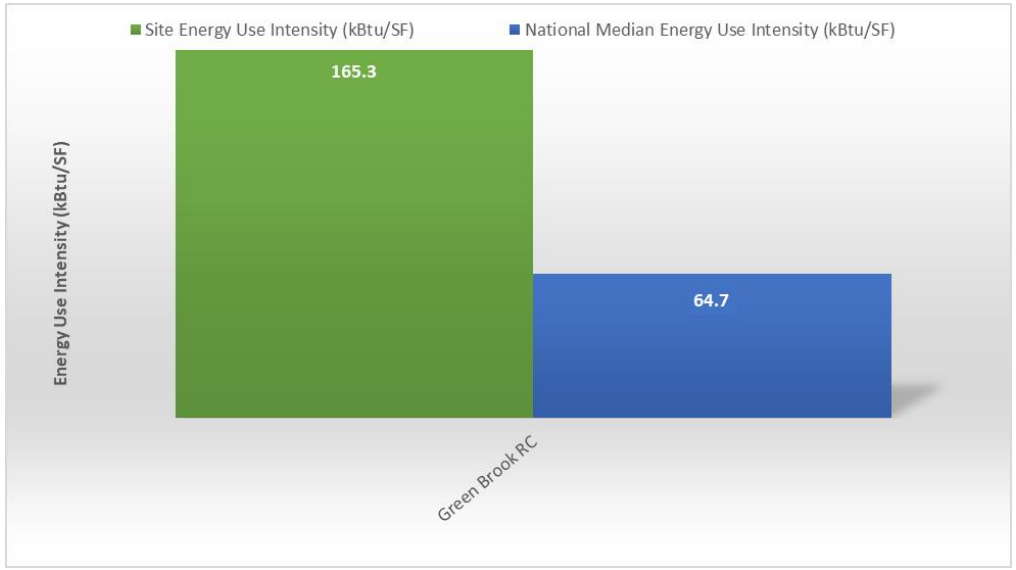
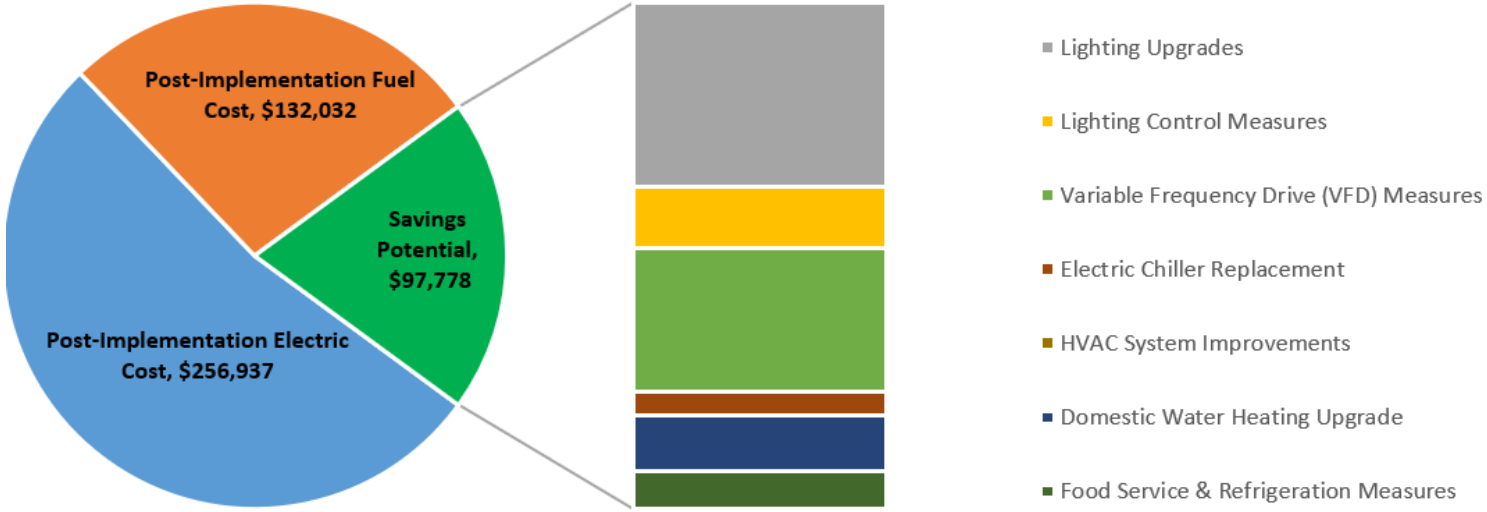
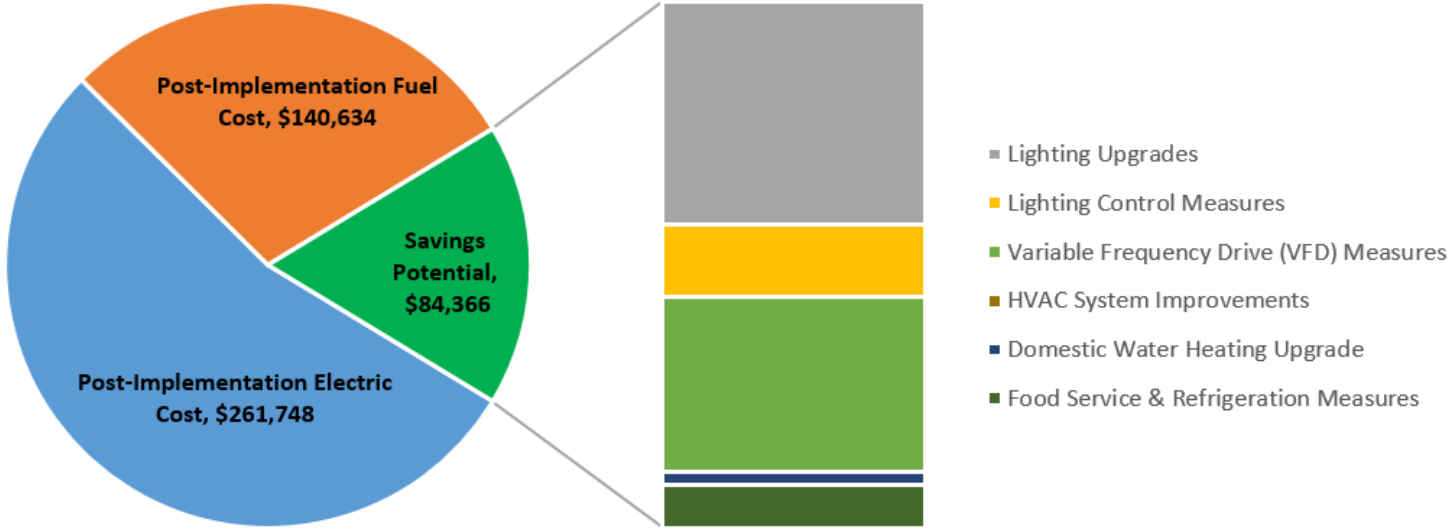



ENERGY STAR® scores are percentile ranking from 1 (least efficient) to 100 (most efficient). It compares your building's energy performance to similar buildings nationwide.

# Savings Potential




***All Opportunities***




***Cost Effective Opportunities***

New Jersey's cleanenergy program™

# GREEN BROOK REGIONAL CENTER

| # | Energy Conservation Measure | Cost Effective? | Annual Electric Savings (kWh) | Peak Demand Savings (kW) | Annual Fuel Savings (MMBtu) | Annual Energy Cost Savings ($) | Estimated M&L Cost ($) | Estimated Incentive ($)* | Estimated Net M&L Cost ($) | Simple Payback Period (yrs)** | $CO_2e$ Emissions Reduction (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lighting Upgrades** | | | **258,066** | **54.3** | **-54** | **$35,706** | **$78,187** | **$12,336** | **$65,851** | **1.8** | **253,502** |
| ECM 1 | Install LED Fixtures | Yes | 2,313 | 0.0 | 0 | $324 | $2,223 | $300 | $1,923 | 5.9 | 2,329 |
| ECM 2 | Retrofit Fluorescent Fixtures with LED Lamps and Drivers | Yes | 190,224 | 34.8 | -41 | $26,316 | $51,581 | $5,752 | $45,829 | 1.7 | 186,810 |
| ECM 3 | Retrofit Fixtures with LED Lamps | Yes | 61,443 | 19.0 | -13 | $8,501 | $23,079 | $6,284 | $16,795 | 2.0 | 60,349 |
| ECM 4 | Install LED Exit Signs | Yes | 4,087 | 0.5 | -1 | $565 | $1,303 | $0 | $1,303 | 2.3 | 4,014 |
| **Lighting Control Measures** | | | **83,767** | **19.7** | **-18** | **$11,588** | **$67,627** | **$13,845** | **$53,782** | **4.6** | **82,264** |
| ECM 5 | Install Occupancy Sensor Lighting Controls | Yes | 83,767 | 19.7 | -18 | $11,588 | $67,627 | $13,845 | $53,782 | 4.6 | 82,264 |
| **Variable Frequency Drive (VFD) Measures** | | | **199,117** | **33.7** | **0** | **$27,933** | **$112,777** | **$14,900** | **$97,877** | **3.5** | **200,510** |
| ECM 6 | Install VFDs on Chilled Water Pumps | Yes | 74,693 | 12.6 | 0 | $10,478 | $29,246 | $3,700 | $25,546 | 2.4 | 75,216 |
| ECM 7 | Install VFDs on Heating Water Pumps | Yes | 64,968 | 6.3 | 0 | $9,114 | $36,709 | $4,800 | $31,909 | 3.5 | 65,423 |
| ECM 8 | Install Boiler Draft Fan VFDs | Yes | 18,668 | 4.9 | 0 | $2,619 | $13,185 | $2,000 | $11,185 | 4.3 | 18,799 |
| ECM 9 | Install VFDs on Boiler Feedwater Pumps | Yes | 15,467 | 7.5 | 0 | $2,170 | $11,881 | $2,000 | $9,881 | 4.6 | 15,575 |
| ECM 10 | Install VFDs on Process Pumps | Yes | 25,321 | 2.5 | 0 | $3,552 | $21,756 | $2,400 | $19,356 | 5.4 | 25,498 |
| **Electric Chiller Replacement** | | | **31,715** | **9.7** | **0** | **$4,449** | **$160,449** | **$4,624** | **$155,825** | **35.0** | **31,937** |
| ECM 11 | Install High Efficiency Chillers | No | 31,715 | 9.7 | 0 | $4,449 | $160,449 | $4,624 | $155,825 | 35.0 | 31,937 |
| **HVAC System Improvements** | | | **0** | **0.0** | **16** | **$144** | **$266** | **$40** | **$226** | **1.6** | **1,855** |
| ECM 12 | Install Pipe Insulation | Yes | 0 | 0.0 | 16 | $144 | $266 | $40 | $226 | 1.6 | 1,855 |
| **Domestic Water Heating Upgrade** | | | **278** | **0.0** | **1,152** | **$10,538** | **$278,672** | **$1,651** | **$277,021** | **26.3** | **135,136** |
| ECM 13 | Install High Efficiency Gas-Fired Water Heater | No | 0 | 0.0 | 944 | $8,601 | $270,682 | $0 | $270,682 | 31.5 | 110,478 |
| ECM 14 | Install Low-Flow DHW Devices | Yes | 278 | 0.0 | 208 | $1,937 | $7,991 | $1,651 | $6,340 | 3.3 | 24,658 |
| **Food Service & Refrigeration Measures** | | | **52,881** | **5.8** | **0** | **$7,418** | **$62,208** | **$5,310** | **$56,898** | **7.7** | **53,251** |
| ECM 15 | Refrigerator/Freezer Case Electrically Commutated Motors | No | 264 | 0.0 | 0 | $37 | $2,730 | $360 | $2,370 | 64.1 | 265 |
| ECM 16 | Refrigeration Controls | No | 2,315 | 0.0 | 0 | $325 | $10,963 | $625 | $10,338 | 31.8 | 2,331 |
| ECM 17 | Replace Refrigeration Equipment | Yes | 48,348 | 5.5 | 0 | $6,782 | $48,055 | $4,275 | $43,780 | 6.5 | 48,687 |
| ECM 18 | Vending Machine Control | Yes | 1,954 | 0.2 | 0 | $274 | $460 | $50 | $410 | 1.5 | 1,968 |
| **TOTALS (COST EFFECTIVE MEASURES)** | | | **591,531** | **113.4** | **152** | **$84,366** | **$315,363** | **$47,097** | **$268,266** | **3.2** | **613,444** |
| **TOTALS (ALL MEASURES)** | | | **625,825** | **123.1** | **1,095** | **$97,778** | **$760,187** | **$52,706** | **$707,481** | **7.2** | **758,455** |

# Energy Efficient Best Practices

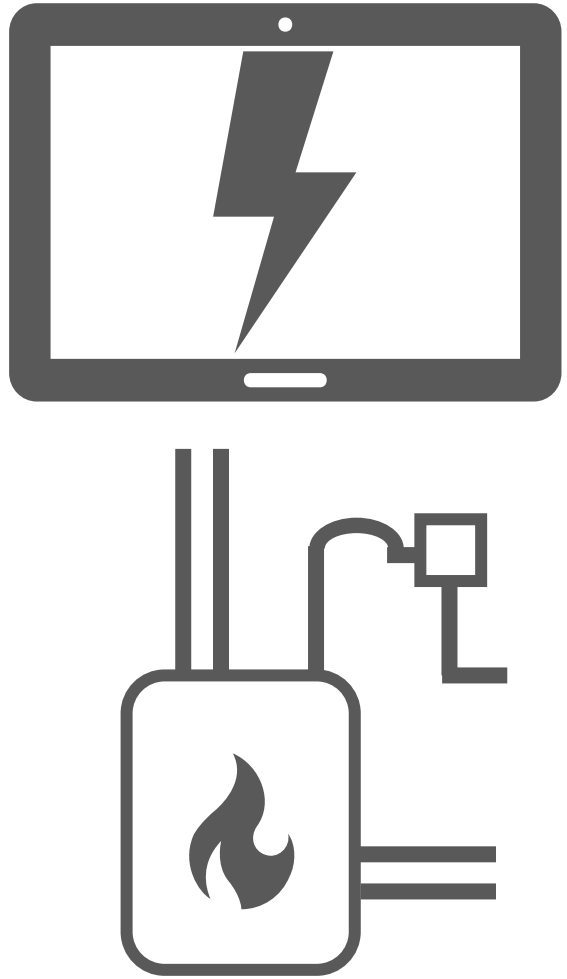
- Reduce Air Leakage
- Close Doors and Windows
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Use Fans to Reduce Cooling Load
- Use Window Treatments/Coverings
- Clean and/or Replace HVAC filters
- Check and Seal Duct Leakage
- Perform Proper Boiler Maintenance
- Perform Proper Water Heater Maintenance
- Plug Load Controls
- Water Conservation

***See individual reports for specific EE practices by building***

# Measures for Future Consideration

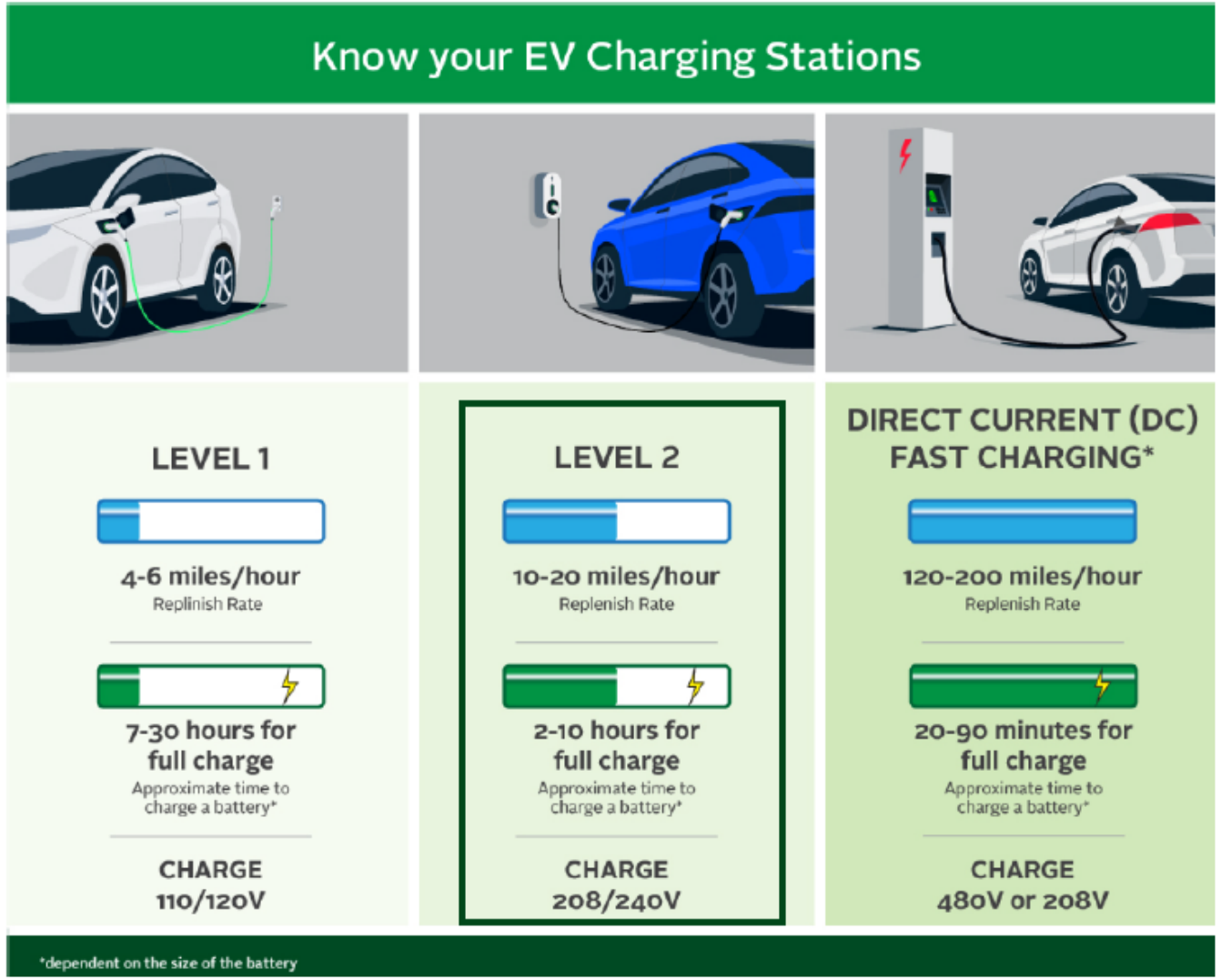
- Installation of an Energy Management System

- Heating System Conversion from Steam to Hot Water



# EV Charging Station Potential

NJCleanEnergy.com/EV



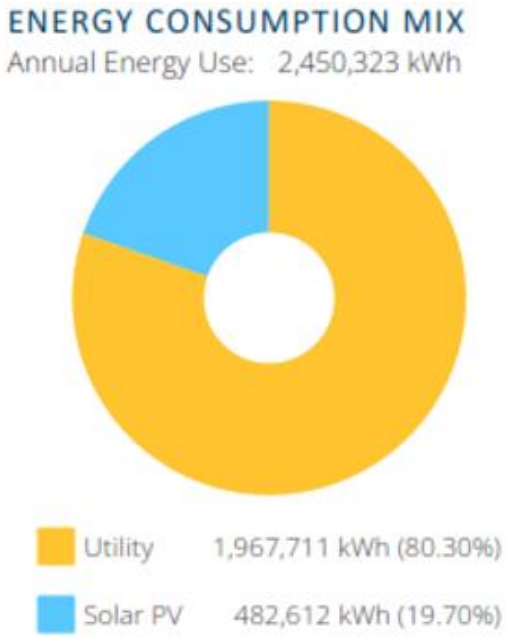

| | Green Brook |
|---|---|
| Potential: | **Medium** |

# SOLAR ENERGY GENERATION POTENTIAL

NJCleanEnergy.com/renewable-energy

| Equipment | Estimated Max Demand Savings (kW) | Estimated Annual Energy Generation (kWh) | Estimated Annual GHG Reduction ($MT\text{-}CO_2e$) | Estimated Annual Cost Savings ($) | Estimated Gross Project Cost ($) | Total Incentives ($) | Net Project Cost ($) | Simple Payback Period (yr) |
|---|---|---|---|---|---|---|---|---|
| 361 kW Solar PV | 0 | 482,612 | 96 | $53,142 | $2,036,758 | $1,120,217 | $916,541 | 17.2 |
| 300 kWh Battery | 37 | 0 | 0 | $663 | $365,242 | $200,883 | $164,359 | 247.8 |
| Total | 37 | 482,612 | 96 | $53,805 | $2,402,000 | $1,321,100 | $1,080,900 | 20.1 |

*Project Summary Table*




- 361 kW Carport Solar PV System: The carport-mounted solar panels are strategically positioned to make the most efficient use of the parking space, maximizing the coverage of solar energy generation, while avoiding the shaded areas.
- 300 kWh BESS: The sizing of the battery has been optimized to ensure that the projected annual cost savings remain within a positive range for the battery installation project.


7,563
tons of CO2 Offset

17,190,639
Miles Driven By Cars

113,414
Trees Planted

# Combined Heat & Power Potential

| | Green Brook |
|---|---|
| *Potential:* | **HIGH** |
| *System Type:* | Recip Engine |
| *System Potential: (kW)* | 390 |
| *Electric Generation: (kWh per year)* | 839,086 |
| *Thermal Generation: (MBtu per year)* | 3,830,610 |
| *Displaced Cost: (per year)* | $74,603 |

# FINANCING MECHANISM: ESIP

NJCleanEnergy.com/ESIP

## ENERGY SAVINGS IMPROVEMENT PROGRAM (ESIP)

- Energy Performance Contracting = NJ ESIP Program
- A creative tool and financing mechanism that allows public entities to make energy efficiency improvements without impacting their budgets
- Administered by the NJBPU
- Project is paid for with the value of its own energy savings
- 2 Options: Lease Purchase Loan or Bond
- 15 or 20 year pay back term
- NJBPU Approved Incentive Programs
    - Utility or NJCEP
- Can be combined with Federal/State Grants
- No upfront capital expenses
- No referendum or impact to tax payers

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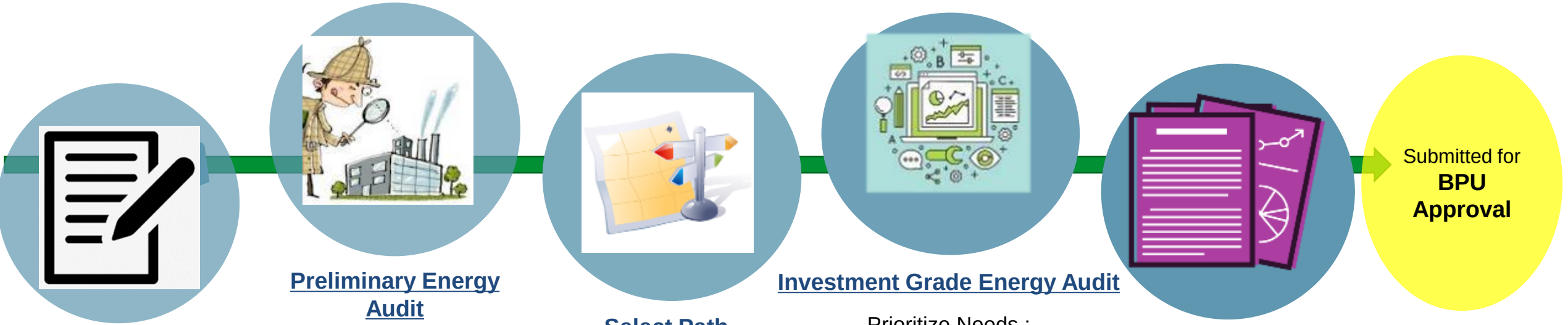
# Energy Savings Improvement Program

NJCleanEnergy.com/ESIP



**ESIP Intake Form**

Get informed;
Begin the process

**Preliminary Energy Audit**

Free LGEA
or
other ASHRAE Level II Audit

**Select Path**

ESCO, Hybrid or DIY Model;
Local Public Contract Law
Public School Contract Law
Compliance

**Investment Grade Energy Audit**

Prioritize Needs ;
Select Project's ECM's

**Energy Savings Plan**

Must be Cash Flow Positive;
Purchase Savings Guarantee?
Third Party Verification

Submitted for **BPU Approval**

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# Energy Savings Improvement Program

NJCleanEnergy.com/ESIP

## FOR MORE INFORMATION


**Michelle Rossi**

ESIP Coordinator

ESIP@bpu.nj.gov

o: 609.913.6295

c: 609.915.0903

# C&I Energy Efficiency Programs

NJCleanEnergy.com

LOCAL GOVERNMENT CUSTOMERS

COMMERCIAL & INSTITUTIONAL CUSTOMERS

LARGE ENERGY CUSTOMERS

## EXISTING BUILDINGS

### MEASUREMENT & AUDITS

FREE Energy Audits

### RETROFITS

Prescriptive & Custom Rebates

Direct Install

Engineered Solutions

**And more from your local utility!**

Incentives up to $4 million for eligible projects

## NEW CONSTRUCTION

Prescriptive & Custom Rebates for New Construction and Gut Rehabs

Pay for Performance incentives for buildings over 50,000 sq. ft.

## DISTRIBUTED ENERGY RESOURCES

Combined Heat & Power and Fuel Cell Installation Incentives

Microgrid Development

Battery Storage

Muni EV Fleets

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**Key:**

*Programs run by investor-owned utility companies*

*Programs run by NJCEP*

# Utility Run Energy Efficiency Programs

NJCleanEnergy.com/Transition

**PRESCRIPTIVE & CUSTOM REBATES:**

- Individual high efficiency equipment rebates for renovation, remodeling, and equipment replacement
- Flexibility to do a little or a lot
- No size requirement

**DIRECT INSTALL:**

- Turn-key retrofit program to replace outdated and inefficient equipment including, lighting, HVAC, refrigeration, etc.
- The facility must have an average electric peak demand <200kW in the previous year to qualify

**ENGINEERED SOLUTIONS:**

- Comprehensive, whole-building approach to saving energy
- The facility must have an average electric peak demand >200kW in the previous year to qualify

# Utility Run Energy Efficiency Programs

**PSE&G**

Dave Kirsch – David.Kirsch@pseg.com
Steve Barba – Steven.T.Barba@pseg.com

# State Facilities Initiative (SFI)

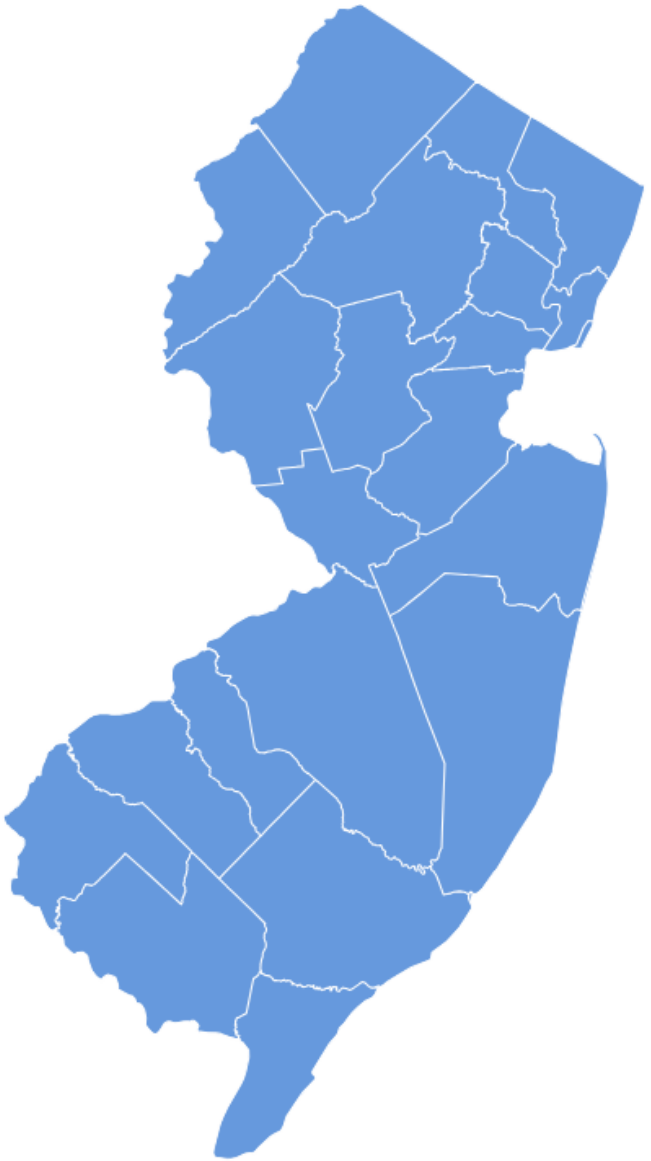
## The State Facilities Initiative (SFI)

*This program is for State-owned facilities.*

The program identifies and implements Energy Efficiency projects in State-owned facilities or State-sponsored projects with the objective of producing energy and cost savings.  The funding provided to the SFI is directly in line with EMP Goals 3.3.5 and 4.1.1.

EMP Goal 3.3.5 seeks to "[i]mprove energy efficiency in, and retrofit state buildings to, a high performance standard."

EMP Goal 4.1.1 addresses electrifying State facilities.



# Combined Heat & Power - Fuel Cells

NJCleanEnergy.com/CHP

| | |
|---|---|
| **WHO** | C&I customers that require on-site electric generation that either does or does not utilize waste heat |
| **SIZE TO QUALIFY** | N/A - Projects must pass a cost-effectiveness test and run 5,000 full load equivalent hours per year (3,500 for critical facilities) |
| **ABOUT** | • Combined Heat & Power (CHP) units generates electricity and recycle waste heat to provide heating or cooling<br>• Resiliency with return on investment<br>• Technology-neutral incentives<br>• Fuel Cells (FC) with or without heat recovery (HR) |
| **INCENTIVE LEVELS** | • CHPs and FC with HR have a project cap of $2M - $3M<br>• 25% bonus for critical facilities with black-start/islanding capabilities<br>• Up to 30% incentive bonus for CHP using biofuel<br>• FC without HR have a project cap of $1M |

# COMBINED HEAT & POWER - FUEL CELLS

NJCleanEnergy.com/CHP

| Eligible Technology | Size (Installed Rated Capacity) | Incentive ($/Watt) [5] | % of Total Cost Cap per project | $ Cap per project |
|---|---|---|---|---|
| CHP powered by non-renewable or renewable fuel source, or a combination[4]:<br>• Gas Internal Combustion Engine<br>• Gas Combustion Turbine<br>• Microturbine<br>Fuel Cell with Heat Recovery (FCHR) | ≤500 kW[1] | $2.00 | 30-40%[2] | $2 million |
| | >500 kW – 1 MW[1] | $1.00 | | |
| | >1 MW – 3 MW[1] | $0.55 | 30% | $3 million |
| | >3 MW[1] | $0.35 | | |
| Fuel Cell without Heat Recovery (FCwoHR) | Same as above[1] | Applicable amount above | 30% | $1 million |
| Waste Heat to Power (WHP)[3]<br>Powered by non-renewable fuel source. Heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine) | ≤1 MW[1] | $1.00 | 30% | $2 million |
| | >1 MW[1] | $0.50 | 30% | $3 million |

+critical facility/blackstart bonus of 25%

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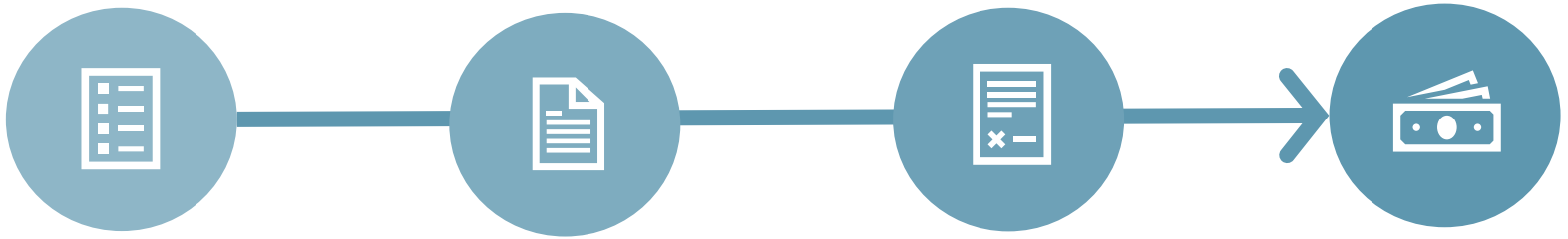
# Large Energy Users

NJCleanEnergy.com/LEUP

| | |
|---|---|
| **WHO** | Large C&I entities who have paid a minimum of $5,000,000 in the previous 12 months of utility bills |
| **SIZE TO QUALIFY** | The average peak demand of all facilities submitted ≥400kW and/or 4,000 DTh |
| **ABOUT** | • Encourages large C&I utility customers to self-invest in energy efficiency, combined heat & power, and fuel cell projects<br>• Must have ability to "bank" funds for up to two fiscal years |
| **INCENTIVE CAP** | Maximum incentive per entity is the lesser of:<br>• $4 million,<br>• 75% of total project cost, or<br>• 90% of NJCEP contribution or annual energy saving caps ($0.33/kWh and $3.75/therm) |

# Large Energy Users

NJCleanEnergy.com/LEUP



**Program Enrollment**

Submission and Approval of Application

**Submission of Draft Energy Efficiency Plan**

Reservation of Incentives (optional)

**Submission of Final Energy Efficiency Plan**

Commitment of Incentives

**Confirmation of Installation**

Incentives Paid

# For More Information

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# THANK YOU