



NJ Clean Energy Program:

Save Money and Energy at the Local Level

Sustainability Summit

June 21, 2017

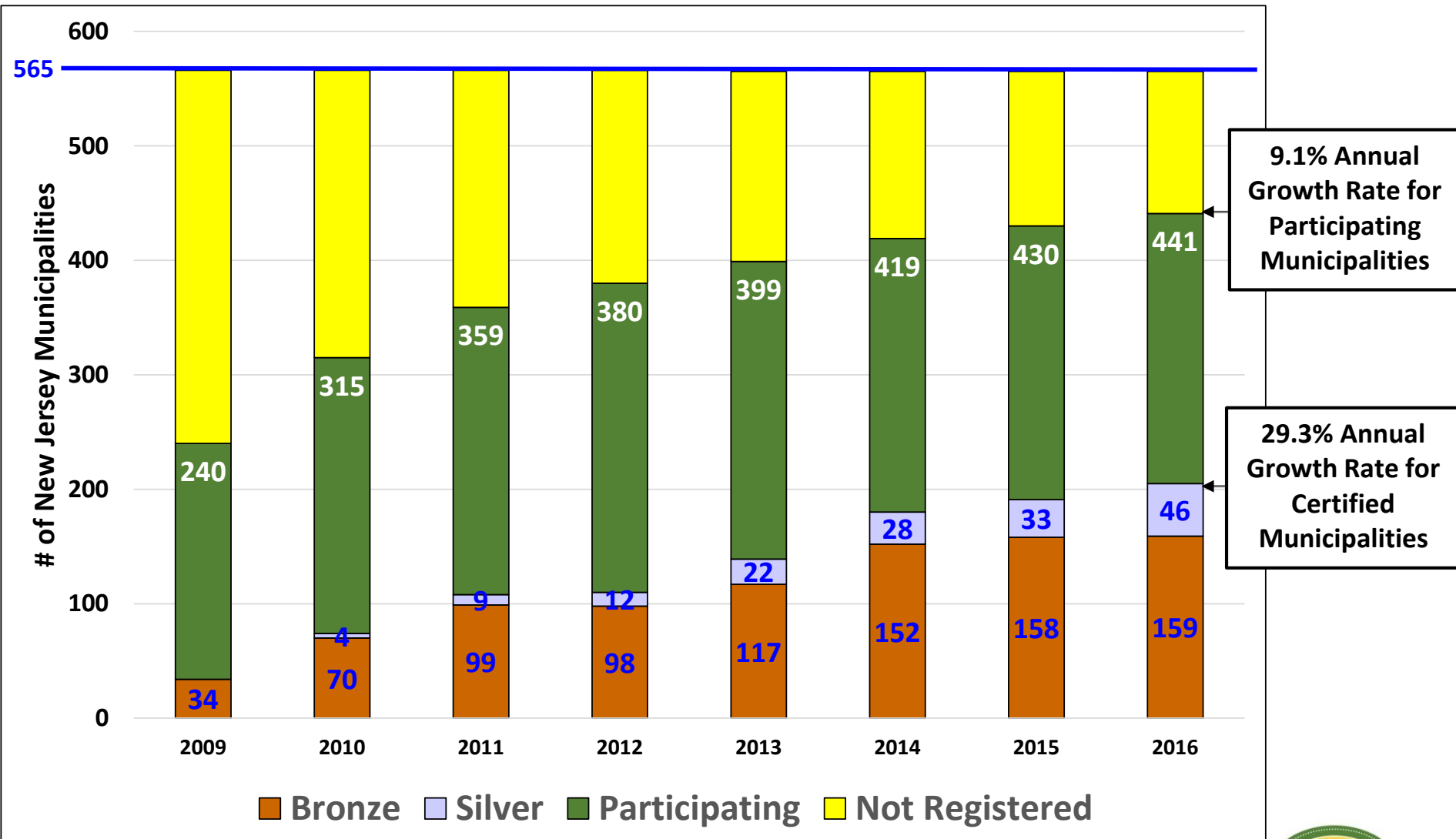
Presenters:

Tony O'Donnell, Economist – Sustainable Jersey

Gary Finger, Ombudsman – NJ Board of Public Utilities

Mike Thulen, ESIP Coordinator – NJ Board of Public Utilities

Statewide Impact by Year – Municipal Program



Municipal Program Energy Actions 2017

	Climate Planning and Energy Efficiency	Renewable Energy	Alternative Vehicles
Energy Impact Of Municipal Operations	<ul style="list-style-type: none">• Municipal Carbon Footprint• Energy Tracking & Management• Energy Efficiency for Municipal Facilities	<ul style="list-style-type: none">• On-Site Solar Energy• On-Site Geothermal• On-Site Wind Energy• Purchase Renewable Energy	<ul style="list-style-type: none">• Fleet Actions• Procurement Actions
Municipal Impact On Community Energy Use	<ul style="list-style-type: none">• Community Carbon Footprint• Climate Action Plan• Residential Energy Efficiency Outreach• Commercial Energy Efficiency Outreach	<ul style="list-style-type: none">• Wind Ordinance• Renewable GEA• Make Your Town Solar Friendly• Community-Led Solar Initiatives	<ul style="list-style-type: none">• Make Your Town EV Friendly• Public EV Chargers

Municipal Action Statistics (2010-2016)

		Actions Submitted	Actions Approved	Success Rate
		All Program Years Summary		
Energy Efficiency				
Energy Tracking and Management	10 Points	125	65	52%
DIRECT INSTALL				
Achieving Target Increase in Local Business Participation	10 Points	19	5	26%
Outreach Campaign to Local Business Community	10 Points	46	23	50%
ENERGY AUDITS FOR MUNICIPAL FACILITIES				
Energy Audits for One Building (2010-2015)	20 Points	147	95	65%
Inventory and Upgrade All Buildings (2010-2015)	50 Points	224	180	80%
Energy Audits (2015-2016)	5-20 pts	30	11	37%
Implement Energy Efficiency Measures (2015-2016)	10-30 pts.	29	2	7%
HIGH EFFICIENCY MUNICIPAL BUILDINGS				
High Performance Building	10 Points	30	6	20%
High Performance Building Portfolio	20 Points	9	1	11%
HOME PERFORMANCE WITH ENERGY STAR				
Municipal Program	20 Points	22	7	32%
Outreach	10 Points	27	5	19%
Sub Totals for Energy Efficiency Actions→		708	400	56%
Totals for Municipal Energy Actions →		1,304	737	57%

Municipal Action Statistics (cont.)

		Actions Submitted	Actions Approved	Success Rate
		All Program Years Summary		
Sustainability Planning				
Climate Action Plan	10 Points	24	10	42%
Community Carbon Footprint	10 Points	50	33	66%
Municipal Carbon Footprint	10 Points	102	71	70%
Wind Ordinance	10 Points	71	46	65%
Community Partnership & Outreach				
Energy Education and Outreach	10 Points	94	46	49%
School-based Energy Conservation Programs	10 Points	58	15	26%
Innovative Demonstration Projects				
Geothermal Energy	10 Points	16	4	25%
Solar	10 Points	148	101	68%
Wind	10 Points	14	6	43%
Renewable Government Energy Aggregation	5-50 pts.	4	0	0%
Make Your Town Electric Vehicle Friendly	15 points	6	0	0%
Public Electric Vehicle Charging Stations	15 points	9	5	56%
Sub Totals for Other Energy Actions →		596	337	57%
Totals for Municipal Energy Actions →		1,304	737	57%

School Action Statistics (2015-2016)

		Actions Submitted	Actions Approved	Success Rate
		All Program Years Summary		
Energy Efficiency				
Energy Audit	5-20 pts.	167	131	78%
Building Efficiency Measures	5-30 pts.	106	61	58%
Energy Tracking & Management	10-20 pts.	122	92	75%
Sustainable Energy Transition Plan	10-20 pts.	27	5	19%
Climate Mitigation & Renewable Energy				
School Carbon Footprint	10 pts.	79	35	44%
Buy Renewable Electricity	10 pts.	71	38	54%
Collaborate with Municipality on Government Energy Aggregation Program	10 pts.	10	1	10%
Onsite Renewable Generation System - Geothermal	10 pts.	9	5	56%
Onsite Renewable Generation System - Solar	5-40 pts.	74	51	69%
Totals for Schools Energy Actions →		665	419	63%
Program-wide Totals for Energy Actions →		1,969	1,156	59%

Thank You!

For further information, contact:

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- Sustainable Jersey websites
 - www.sustainablejersey.com
 - www.sustainablejerseyschools.com





New Jersey's Clean Energy Program



Opportunities for Commercial, and Institutional
Buildings

Gary E Finger
Ombudsman



NJCEP BACKGROUND



- Administered by the New Jersey Board of Public Utilities
- Funded from “Societal Benefits Charge” on utility bill
- Program Goals:
 - Save energy and lower operating cost
 - Protect environment and lower emissions
 - Change the business mindset

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
- Sandy Relief Plan

Whole Buildings:

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

Energy Generation:

- Combined Heat and Power (CHP) and Fuel Cells

Audits:

- Local Government Energy Audits



HIGH
SCHOOL

FREE BENCHMARKING
REPORT

WHAT IS BENCHMARKING?

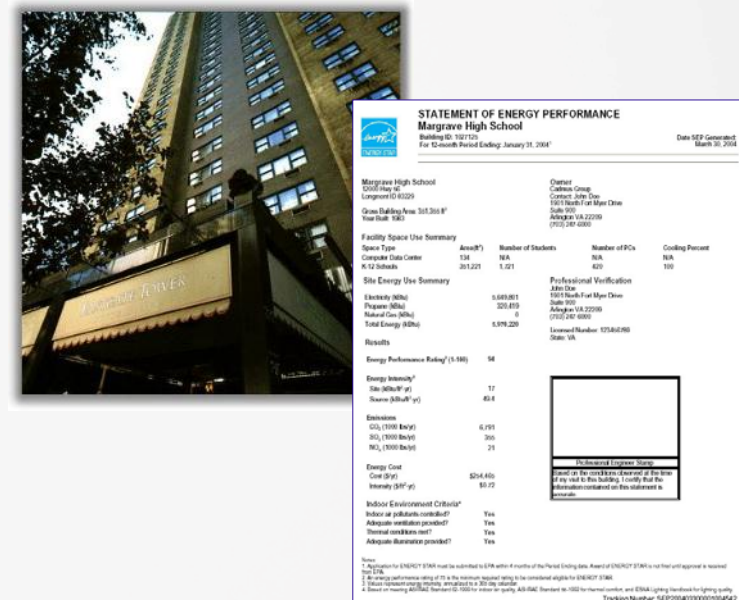


Is 60 MPG high or low for this automobile?



Fuel Efficiency: MPG

Is 90 kBtu/SF/YR high or low for this building?



Energy Performance Source: 1 to 100

BENCHMARKING OVERVIEW



- Open to Commercial, Industrial, Agricultural, Government, Non-Profit and Institutional Customers
- Free Benchmarking Report includes:
 - An ENERGY STAR® Portfolio Manager score
 - Suggestions for improving operations and maintenance
 - Identification of relevant incentives and program options for energy efficiency projects

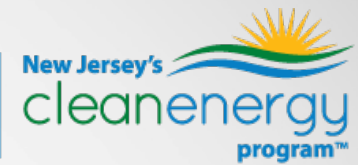
WHY BENCHMARK?



- Understand energy usage and costs
- First step for ENERGY STAR certification
- Identify under-performing facilities
- Assess effectiveness of operations
- Assist in goals, targets and timelines
- Set investment priorities
- Verify and document pre and post project energy use



HOW TO PARTICIPATE



To Request a Benchmarking report:

- Visit NJCleanEnergy.com/BENCHMARKING
- Submit the online data collection form
- Submit 12 consecutive months of energy data or a signed Fuel/Energy Release Authorization Form





LOCAL GOVERNMENT ENERGY AUDIT (LGEA)

LGEA: OVERVIEW



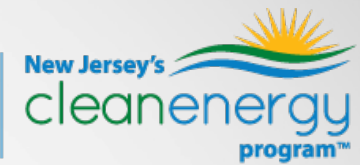
AVAILABLE TO

- Local governments under Local Public Contracts Law
- Local governments under Local Public School Contracts Law
- County colleges under County College Contracts Law
- NJ State Colleges or State Universities
501(c)(3) Non-profit Agencies

INCENTIVE

The program subsidizes 100% of the audit cost, subject to an annual incentive cap of \$100,000 per entity, per fiscal year.

LGEA: HOW IT WORKS



- TRC Solutions (Clean Energy Program Manager) provides ASHRAE level II audit, using an on-line application process
- Strict parameters to analyze building(s) energy use
- Choose among list of recommended, cost-effective energy efficiency upgrades
- Apply for additional incentives from *New Jersey's Clean Energy Program*



NJ SMARTSTART BUILDINGS

SMARTSTART: OVERVIEW



- Two types of incentives for high efficiency equipment installation:
 - Prescriptive Incentives
 - Custom Incentives
- Available to all Commercial, Industrial, Agricultural, Government, Non-Profit and Institutional customers
- Includes New Construction, Rehab and Retrofit projects
- Project pre-approval required
- Incentives up to \$500,000 per electric account and \$500,000 per natural gas account.

SMARTSTART: INCENTIVES



Prescriptive Incentives

- Project Categories:
 - New Construction
 - Renovation
 - Remodeling
 - Equipment Replacement
- Specific incentives and individual applications for Lighting, HVAC, VFDs, Refrigeration, Controls and more.

SMARTSTART: INCENTIVES



Custom Incentives

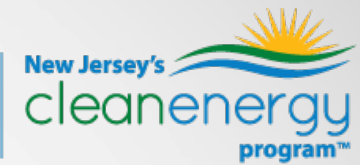
- Designed for new or innovative technologies proven to be cost-effective and not listed as prescriptive
- Incentives paid for approved projects at the lesser of three values:
 - 50% of project cost
 - Buy down to one year payback, OR
 - \$0.16/kWh, \$1.60/ therm saved in first year
- Projects must have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



DIRECT INSTALL



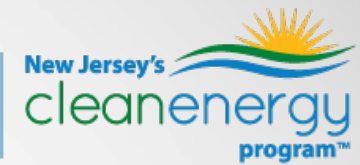
DIRECT INSTALL: OVERVIEW



- A turn-key retrofit program to replace outdated and inefficient equipment
- Lighting, HVAC, Refrigeration
- Open to Small to Mid-Sized Commercial and Industrial facilities with a peak electric demand ≤ 200 kW
- **Provides incentives of 70% of the installed cost**
- Incentives are paid directly to the contractor
 - Customer only pays remaining 30% of installed cost
 - \$125,000 project cap
 - \$250,000 per entity cap



DIRECT INSTALL: BENEFITS



- Turnkey process: participating contractors provide support and process all paperwork
- Minimal cost: Low upfront cost with generous incentives
- Fast turnaround time: Average length of time for job completion, 4-6 months
- Ongoing savings: Projects provide energy savings year after year



DIRECT INSTALL EXAMPLES



EDEN AUTISM SERVICES



- Commercial Office
- Lighting & HVAC retrofit
- Total Project Cost: \$96,741
- **Incentive: \$67,719**
- **Annual Savings: \$14,124**
- **Payback Period: 2.05 Years**



HAMILTON TOWNSHIP FIRE DISTRICT #2

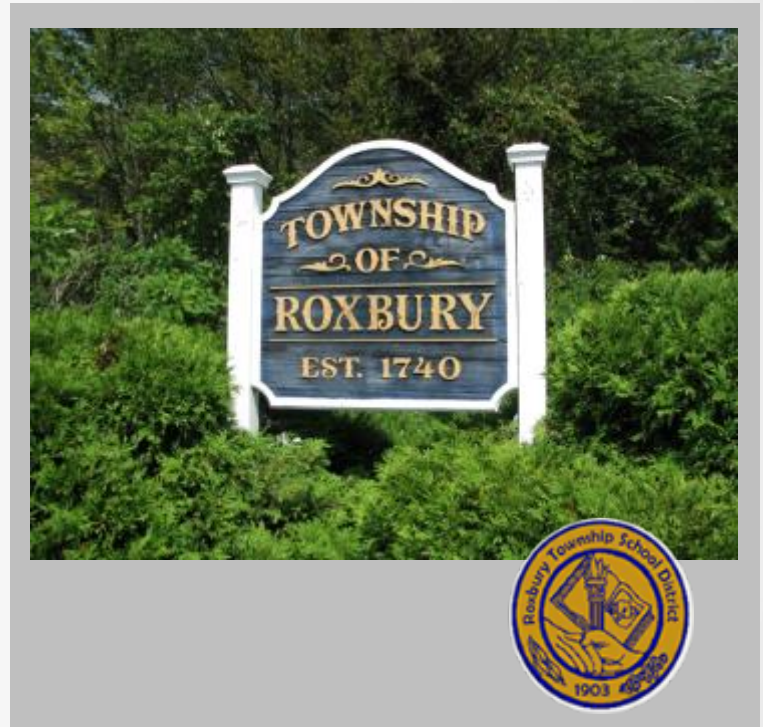


- Municipal Fire Station
- Lighting & HVAC retrofit
- Total Project Cost: \$125,664
- **Incentive: \$87,965**
- **Annual Savings: \$12,961**
- **Payback Period: 2.9 Years**



ROXBURY TOWNSHIP PUBLIC SCHOOLS

- Public Elementary School
- Lighting & HVAC retrofit
- Total Project Cost: \$119,740
- **Incentive: \$83,818**
- **Annual Savings: \$16,229**
- **Payback Period: 2.2 Years**



LIBRARY IV



- Restaurant
- Lighting & HVAC retrofit
- Total Project Cost: \$61,283
- **Incentive: \$42,898**
- **Annual Savings: \$9,052**
- **Payback Period: 2.0 Years**



MIDDLESEX COUNTY EXTENSION SERVICES



- County Park Building
- Lighting & HVAC retrofit
- Total Project Cost: \$79,505
- **Incentive: \$55,654**
- **Annual Savings: \$11,604**
- **Payback Period: 2.1 Years**



McDONALD'S



- Franchise in Piscataway
- Lighting & HVAC retrofit
- Total Project Cost: \$85,331
- **Incentive: \$59,731**
- **Annual Savings: \$9,478**
- **Payback Period: 2.7 Years**



SHOP n BAG



- Grocery store in Farmingdale
- Lighting, refrigeration controls and grocery aisle covers and doors
- Total Project Cost: \$155,121
- Incentive: \$108,585
- Annual Savings: \$34,719
- Payback Period: 1.3 Years



CHURCH OF THE NATIVITY



- Catholic parish and non-profit school in Midland Park
- Lighting & HVAC retrofit
- Total Project Cost: \$24,872
- **Incentive: \$17,410**
- **Annual Savings: \$2,937**
- **Payback Period: 2.5 Years**





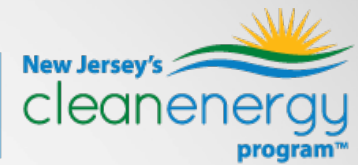
PAY FOR PERFORMANCE (P4P)

P4P: OVERVIEW



- Comprehensive, whole-building approach to saving energy in existing or new facilities
- Goal: reduce consumption by 15% or more
- Incentives up to \$2 million per project, assuming both gas and electric improvements are made; \$4 million annual entity cap
- Incentives paid in three installments at milestones
- Customer chooses from network of pre-approved participating Partners

P4P: OVERVIEW



- Existing Buildings: Large Commercial, Industrial Institutional and certain multifamily with an annual peak demand in excess of 100kW
- New Construction: Projects with over 50,000 square feet of planned conditioned space
- Eligibility requirements flexible for hospitals, 501(c)(3) non-profits, local government buildings, affordable multi-family housing and public universities and colleges

P4P: HOW IT WORKS



- Projects must create an Energy Reduction Plan
 - Prior 12 month energy use baseline for existing buildings
 - Current energy code baseline for new construction projects
 - Incentive Milestone #1 of up to \$50,000
- Implementation of Project
 - Must finish construction or renovation to qualify
 - New Construction projects must submit an As-Built
 - Energy Reduction Plan to address any changes during construction
 - Incentive Milestone #2 paid to customer

P4P: FINAL PAYMENT

To Qualify for Final Payment:

- For existing buildings, after 12 month of consecutive energy billing submit a post-construction report
- Complete commissioning and a Commissioning Report of new construction projects
- Final Incentive Milestone #3 paid to customer

P4P: BENEFITS

- Helps businesses to stay competitive:
 - > 40% of new non-residential buildings are built to green standards
 - More cities are mandating energy performance disclosure of commercial buildings annually
- Increases the value of the building:
 - ENERGY STAR and LEED labeled buildings receive higher prices and have increased occupancy over standard buildings
- Reduces operations and maintenance costs

A wide-angle photograph of a modern office space. In the foreground, a man in a light blue shirt sits at a desk in a cubicle, looking at a Dell monitor and resting his chin on his hand. The cubicle has a white desk and a grey base. To the left, a long hallway with a blue carpet leads into the distance. The office has a high ceiling with exposed white structural beams and large windows on the right side. Various office supplies, plants, and personal items are visible on the desks. A blue semi-transparent box is overlaid on the bottom left of the image, containing the text "PAY FOR PERFORMANCE EXAMPLES".

PAY FOR PERFORMANCE EXAMPLES



TROY HILLS VILLAGE



- Multifamily Apartment
- Lighting & HVAC retrofit
- Total Project Cost:
\$1,480,000
- Incentive: \$683,186
- Annual Savings: \$208,927
- Payback Period: 5.5 Years






EDIBLE GARDEN



- New construction 214,000-square foot greenhouse in Belvidere
- Thermal nighttime canopy, condensing boilers, variable frequency drives on pump motors
- Total Project Cost: \$720,005
- **Incentive: \$315,673**
- **Annual Cost Savings: \$56,845**
- **Payback period: 7.1 years**



A grayscale photograph of an industrial facility, likely a power plant or refinery. Large, white, curved pipes dominate the foreground and middle ground. In the background, there are various pieces of machinery, including what appears to be a large cylindrical tank and some electrical control panels. The lighting is bright, coming from overhead fixtures. A semi-transparent blue rectangular overlay is positioned on the left side of the image, containing white text.

COMBINED HEAT & POWER AND FUEL CELLS

CHP/FC: OVERVIEW



- On-site power generation with recovery and productive use of waste heat
- Two paths for incentives:
 - CHP and Fuel Cell systems fueled by non-renewable sources
 - Biopower systems for technologies fueled by biomass, which is handled through the renewable energy program

CHP/FC: OVERVIEW




- Incentives range from \$0.35-\$4.00/watt
- Cap of \$2-\$3 million depending on technology and size
- Incentives paid in three phases:
 - 30% at equipment purchase
 - 60% at installation completion
 - 10% at performance verification

CHP/FC: BENEFITS



- Lower cost: reduces overall electricity purchases from utility
- Less risk: company's energy prices more stable over time
- More reliable: may reduce disruptions from electric grid
- Less waste: utilizes heat that would otherwise be wasted
- More sustainable: on-site generation results in less greenhouse gas emissions



COMBINED HEAT & POWER AND FUEL CELLS EXAMPLES

STEVE & COOKIE'S



- Restaurant by the Jersey Shore
- Micro CHP
- Total Project Cost: \$189,600
- Incentive: \$40,000
- Annual Cost Savings: \$20,588
- Payback Period: 6.3 Years



JERSEY SHORE UNIVERSITY MEDICAL CENTER



- Hospital and Critical Care Facility
- CHP Equipment
- Total Project Cost: \$3,888,805
- **Incentive: \$1,000,000**
- **Annual Savings: \$2,892,703**
- **Payback Period: 1 Year**





Lighting in Your Community



Gary E Finger
NJBPB Ombudsman



Overview

- There are 565 municipalities in New Jersey
- More than 8 million people (ratepayers) in the State.
- Ratepayers pay more than \$110 million annually to light our streets.
- There are just over 745,492 street lights in New Jersey
- Street lighting is paid for in nearly all cases by local government
- This is a budget item that is ultimately reflected in your property tax bill.





Current National Street Lighting Status

- USDOE estimates between 36 – 44 million street lights in U.S.
- Energy costs approx. \$2 billion annually
- USDOE also estimates that 20% of all energy used is for lighting.
- Primary technology used is High Pressure Sodium



Current National Street Lighting Status

- Over 800 cities in the U.S. have either installed LED street lights or plan to install them shortly
- USDOE estimates that a reduction of 24% (48 million kWh) in energy use can be obtained by retrofitting all lights with newer LED technology
- Added benefit: Reported reduction in crime by 12%



Los Angeles before street light conversion (using sodium vapor bulbs)





Los Angeles after street light conversion (using LED's)



Significant
Green
House Gas
reductions

New
lexicon:
Reduction in
Light
Pollution



Municipal costs in New Jersey

- Newark - \$8.6 million annually
- Jersey City - \$4.0 million annually
- Camden - \$1.9 million annually
- Cherry Hill - \$870,000 annually
- Haddonfield - \$111,000 annually



Community Impact / Government Actions

Parking lot lit with metal halide



Same parking lot with LEDs



**Township ordinance requiring new construction using LED technology.
Reduction in crime impacts public safety budgets.**



Where we stand in New Jersey

- If all utility companies offered A LED street lighting tariff, municipalities could possibly save over \$55 million annually
 - This represents between 1 ½% - 2% on a municipalities annual budget
- Not all EDC's (utility companies) have a tariff in place for LED street lighting
- To date, only Atlantic City Electric has such a tariff
- The BPU can not force the EDC's to introduce a tariff for LED street lighting



Options & Opportunities

- Any municipally owned lighting can be retro-fitted to obtain lower costs and lower Green House Gas Emissions now.
- The Clean Energy program provides incentives to convert to LED in many cases.
- If you are located in a territory that provides a LED street lighting tariff (ACE) consider upgrading to LED
- Review the capital costs and determine the payback for your town
- Consider using ESIP to carry the funding.



Approximate Annual Cost for Street Lighting

• Barnegat	144 street lights	\$19,672
• Beach Haven	490 street lights	\$84,094
• Harvey Cedars	176 street lights	\$35,018
• Long Beach	1351 street lights	\$236,349
• Ship Bottom	332 street lights	\$86,323
• Surf City	217 street lights	\$35,705
• Absecon	2022 street lights	\$127,413
• Stafford Twp	3727 street lights	\$412,965



Options

The Office of Clean Energy provides LED incentives up to \$150 per light, including cobra head street lighting.

Working with the street lighting tariffs submitted by Atlantic City Electric (ACE), under their SPL Rate schedule (Street and Private Lighting) a town can take advantage of improved lighting quality and slightly lower monthly costs.

Under ACE's CSL Rate Schedule (CSL) when a town fronts the capital cost of the lighting the annual municipal lighting rates drops by over 65%.



New Jersey Board of Public Utilities

Energy Saving Improvement Programs



aka: **ESIP**; P.L. 2012, c. 55



Mike Thulen
ESIP Coordinator

WHAT ESIP IS ALL ABOUT

- Retrofitting public facilities with Energy Conservation Measures (ECM) without new capital investment
 - Savings from reduced energy use pays for the improvements = No New Money!
- Applies to all government contracting units, including school districts

ECM CATEGORIES

- Distributed generation (solar, wind, geo, bio...)
- Major HVAC (capital) and minor HVAC (non-capital)
- Energy efficiency, demand response equipment
- Non-energy savings related (building envelope)
- Future capital replacements
- Standalone lighting improvements
- New energy related capital improvements, i.e., new air conditioning installation Must be funded separately from non-operating (i.e., capital improvement) funds
- **Water savings, i.e., low flow fixtures**

HOW ESIP IS FUNDED

- An ESIP is either a Self Refunding Bond or Lend-Lease Operation
- Capital Project Energy refunding comes from the energy savings that were budgeted as energy line item in the general budget
- Incentives from the Clean Energy Program
- Demand Response Savings through lower energy use
- Energy Resiliency Bank
- Federal Tax Incentives from (Lend-Lease programs)
- **ROID Grants cannot be combined with ESIP**

CONTRACTING OPTIONS AVAILABLE

ESCO OPTION

- **Plan A – ESCO Option**
 - ESCO is a single contractor that develops & manages the process, including offering guaranteed savings.
 - Use public bidding or competitive contracting process to award a contract to a firm (ESCO) to develop & manage construction of improvements
 - ESCO must give a guarantee of savings opportunity to government entity
 - Contract award is for “most advantageous, price and other factors considered process” or “lowest responsible bidder.”

CONTRACTING OPTIONS AVAILABLE

DIY MODEL

- **Plan B – DIY Model**
- Hire an energy consultant to develop your Energy Savings Plan
- Develop your own specs and bid the job...
 - Or hire professionals to provide that service
- Rely on built-in verification process to assure savings

CONTRACTING OPTIONS AVAILABLE

HYBRID MODEL

- **Plan C – Hybrid Model – Combination of ESCO & DIY**
- Hire an Architect or Mechanical Engineer to manage an ESCO project
- Develop a plan that the professional will put out to bid as a RFP
- Allow the professional to take the entity (gov't or school) through the interview process
- Allow the professional to be the liaison through the project to the ESCO

ESIP IS A FUNDING PROGRAM

- **Requirements for an Energy Savings Plan**
- No Negative Cash Flow
- No Capital Cost Avoidance (except on a very limited basis)
- No use of SREC's in Cost Savings Calculations
- Independent Third Party Review of Plan
- Maximum 15 Year Pay Back Standard Plan
- Maximum 20 Year Back with Combined Heat & Power Plan

BPU JURISDICTION OF ESIP

- **Guidelines – The Final Word**
- RFP must be approved by the BPU
- Mandatory pre-proposal conference for interested, DPMC certified ESCO's
- BPU will receive, at a minimum, a CD or Flash Drive copy of each phase of the proposal and contract process
- Investment Grade Audit (IGA) for the Energy Savings Plan
- After Independent Third Party Review of Plan, BPU must approve plan
- BPU has complete authority to deny any phase and Clean Energy Incentives when deemed necessary

THE STATUS ESIP SINCE 2012

- LGEA over 2400 building in the State of New Jersey can be audited.
- LGEA over 400 government entities, Municipalities, school districts and state agencies have been audited.
- Over 40 school districts have either started or are in the process of completing an ESIP project.
- Several large cities have started the ESIP process with bidding using the RFP provided by the BPU.
- Clean Energy Program is fully funded to help the ESIP program.
- Several school districts have used CHP to extend financing for 20 years without Clean Energy incentives.

MEASUREMENT & VERIFICATION 2014

<u>Entity</u>	<u>Projected Guaranteed Annual Savings</u>	<u>Actual Annual Savings</u>	<u>Percentage Difference</u>
Barneгат School District	\$317,151.00	\$359,411.00	113.32%
Mercer VoTech	\$1,015,724.00	\$1,126,793.00	110.93%
Millville School District	\$616,411.00	\$803,820.00	130.40%
Salem County VoTech	\$529,649.00	\$623,562.00	117.73%
Wyckoff School District	\$368,277.00	\$403,642.00	109.60%
Kearny Township	\$100,604.00	\$122,534.00	121.79%
Bridgewater/Raritan RSD	\$592,025.00	\$593,612.00	100.26%
Hanover Twp School Dist.	\$212,168.00	\$218,104.00	102.79%
Phillipsburg	\$442,341.00	\$521,762.00	117.95%
Franklin Twp	\$99,134.00	\$103,543.00	104.44%
Somerset Hills	\$345,944.00	\$352,647.00	101.93%
Manalapan	\$67,021.00	\$78,623.00	117.31%
Newark Housing Authority	<u>\$4,212,128.00</u>	<u>\$9,411,792.00</u>	<u>123.45%</u>
	\$8,918,577.00	\$14,719,845.00	113.22%

GETTING STARTED

Start with an Energy Audit:

NJCleanEnergy.com/LGEA

Issue a RFP for a Energy Cost Savings Plan: Boiler
Plate Available

NJCleanEnergy.com/ESIP

**Contract Issued
Work Begins
Energy Costs Drop
Savings Begin**