Pathways and Incentives to Financing Clean Energy

Webinar July 13, 2016

Nancy Quirk Program Coordinator Advanced Infrastructure Sustainable Jersey quirkn@tcnj.edu (609) 771-2902



Current Municipal Program Energy Actions

	Climate Planning and Energy Efficiency	Renewable Energy and Advanced Infrastructure	Alternative Vehicles
Municipal Operations	 Municipal Carbon Footprint Energy Tracking & Management Energy Audit Implement Efficiency Measures Energy Transition Plan/ESIP High Performance Buildings 	 On-Site Solar Energy On-Site Geothermal On-Site Wind Energy Purchase Renewable Energy 	 Fleet Inventory Green Fleet Target Green Fleet Procurement
Community Energy Use	 Community Carbon Footprint Climate Action Plan HPwES Community Outreach Direct Install Outreach to Local Business Community 	 Wind Ordinance Renewable GEA Program Make Your Town Solar Friendly 	 Make Your Town EV Friendly Public EV Chargers



Energy Actions in Municipal and Schools Programs

- Define sequence of Energy Efficiency actions
- Allow municipalities/schools to choose most appropriate path
- Recognize variability between municipalities/schools
- > Multi-point structure varies by:
 - impact
 - degree of difficulty



NJCEP and Utility Incentives

- NJ Clean Energy Program (NJCEP) incentives
- Utility company incentives may:
 - Complement NJCEP
 - Offer on-bill repayment
 - Offer 0% interest
 - Have programs for local government facilities, local businesses, and homeowners
- Utility and NJCEP incentives included in SJ Action documents





New Jersey's Clean Energy Program

Opportunities for Commercial, Industrial and Institutional Buildings

Marybeth Brenner

Sustainable Jersey – Pathways and Incentives to Financing Clean Energy

July 13, 2016

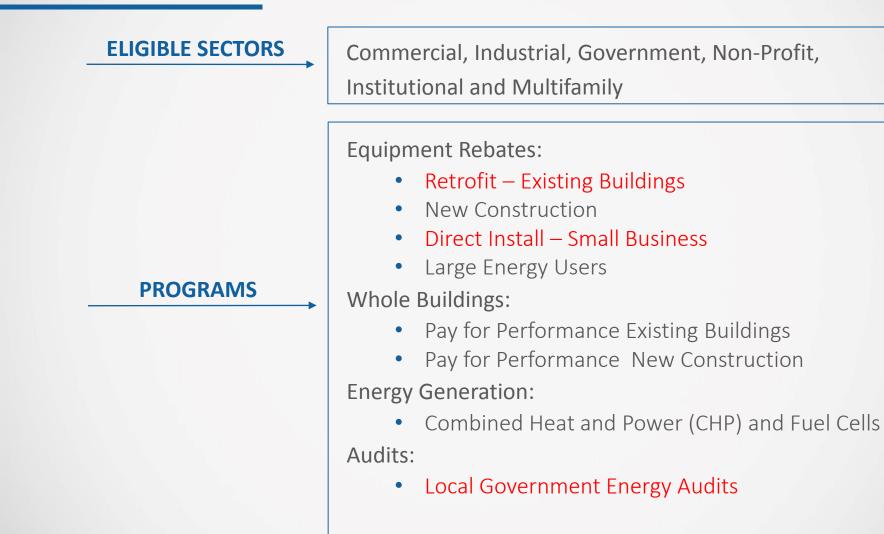
NJCEP BACKGROUND



- 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





LOCAL GOVERNMENT ENERGY AUDIT (LGEA)

rownship of

-0

LGEA: OVERVIEW



- Local governments & schools under Local Public/Schools Contract Laws
- County colleges under County College
 Contracts Law
- NJ State Colleges or State Universities
- 501(c)(3) Non-profit organizations
- State Contracting Agencies & Public Agencies

INCENTIVE

AVAILABLE TO

100% of the audit cost, subject to an annual incentive cap of \$100,000 per entity, per fiscal year. Exceptions possible (up to \$300,000)

LGEA: HOW IT WORKS



- Complete application
- Schedule your audit (no more RFP process)
- Choose among list of recommended, cost-effective energy efficiency upgrades
- Apply for additional incentives from New Jersey's Clean Energy Program

LGEA: NEW FEATURES



- No RFP process for audit firm selection
- Ability to re-apply and get another audit done after 3 years.
- Consistency of audit report format/content.
- Follow up re: NJCEP incentive programs and implementation of recommended measures.

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 for some applications (lighting)
- 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

Ð

D

DIRECT INSTALL



- Program is currently on hold
- Next Steps to re-open:

Approval of general program design by BPU
 Release of RFPs for contractors and equipment
 Selection of Contracts for contractors and vendors
 Approval of all program details

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 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 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

PER

22

HAMILTON TOWNSHIP FIRE DISTRICT #2



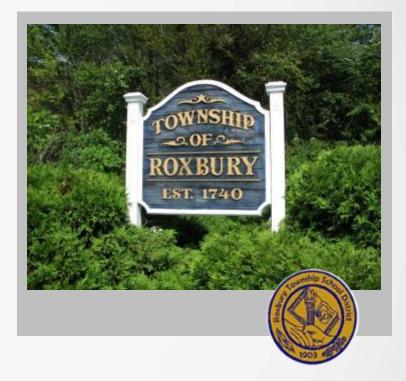
- Municipal Fire Station
- Lighting & HVAC retrofit
- Total Project Cost: \$125,664
- Incentive: \$87,965
- Annual Savings: \$12,961
- Payback Period: 2.9 Years



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



PAY FOR PERFORMANCE (P4P)





- 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





- Existing Buildings: Large Commercial, Industrial Institutional and certain multifamily with an annual peak demand in excess of 200kW
- 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



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

PAY FOR PERFORMANCE EXAMPLES

Dell



FOR MORE INFORMATION

Visit NJCleanEnergy.com Call (866) NJSMART Stay Informed NJCleanEnergy.com/Newsletter To join the Energy Efficiency listserv contact the NJCEP Webmaster.



New Jersey Board of Public Utilities Clean Energy Program

Energy Savings Improvement Program

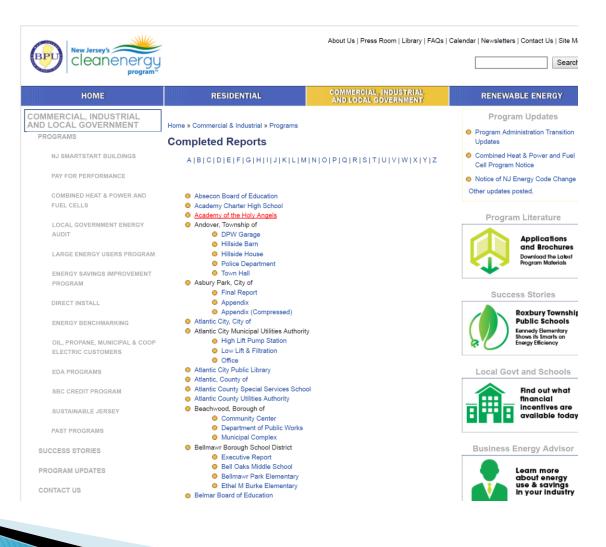
Michael Thulen ESIP Coordinator Pathways and Incentives Workshop

Com, Indust & Local Gov.





LOCAL GOVERNMENT ENERGY AUDIT



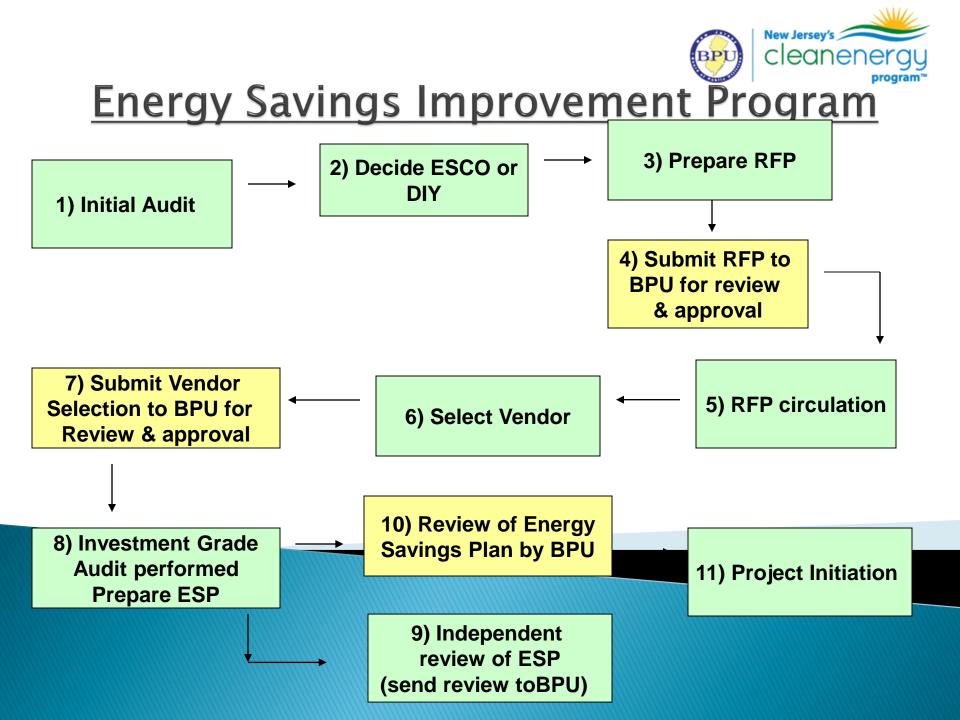


- List of Energy Conservation Measures
- Fuel usage for each of the buildings
- Opportunities in Renewable Energy
- Grant incentive opportunities
- Funding mechanisms ESIP

Energy Savings Improvement Program



	Searc		
номе	RESIDENTIAL	COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT	RENEWABLE ENERGY
OMMERCIAL, INDUSTRIAL			Program Updates
	Home » Commercial & Industrial » Programs Energy Savings Improvement Program		Program Administration Transition
PROGRAMS			Updates
			Combined Heat & David
NJ SMARTSTART BUILDINGS	A new State law allows government agencies to facilities and pay for the costs using the value o	Combined Heat & Power and Fue Cell Program Notice	
PAY FOR PERFORMANCE	Under Chapter 4 of the Laws of 2009 (the law), the "Energy Savings Improvement Program" (ESIP), provides all government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources.		Notice of NJ Energy Code Chang
COMBINED HEAT & POWER AND			Other updates posted.
FUEL CELLS	Disease main the New James de Olasse Frances		
LOCAL GOVERNMENT ENERGY	Please review the New Jersey's Clean Energy I flow chart for recommendations on when to sub programs relative to the ESIP timeframe.	Program (NJCEP) and ESIP Interaction memo and omit incentive applications to various NJCEP	Program Literature
AUDIT			Applications
LARGE ENERGY USERS PROGRAM	This Local Finance Notice outlines how local go their facilities. Below are two sample RFPs:	overnments can develop and implement an ESIP for	and Brochures Download the Latest Program Materials
ENERGY SAVINGS IMPROVEMENT	Local Government		
PROGRAM	School Districts (K-12)		
DIRECT INSTALL	All RFPs and final Energy Savings Plan (ESP) <u>must</u> be submitted to the Board for approval at ESIP@bpu.state.nj.us.		Success Stories
DIREGUINOIREE			NJ TRANSIT
ENERGY BENCHMARKING	The Board also adopted protocols to measure e	energy savings:	LED lighting reduces energy demand,
OIL, PROPANE, MUNICIPAL & COOP	Measuring Energy Savings		improves safety & save on maintenance costs
ELECTRIC CUSTOMERS	Procedures for Implementation		





Energy Savings Improvement Program

- 1) Initial Audit
- 2) Decide whether to go forward as an ESCO or DIY project
- 3) Prepare Draft RFP (Boiler Plate Available) / submit to BPU for review
- 4) RFP proposal review by the BPU completed within 14 days
- 5) RFP circulation must be in local newspapers and direct notification to <u>all</u> DPMC-approved ESCO's
- 6) Select Vendor / award contract
- 7) Vendor Selection review by the BPU completed within 14 days
 - Send all Bids to BPU for Reporting
- 8) Investment Grade Audit performed / prepare ESP
- 9) Independent Third Party review of ESP (must send to BPU)
- 10) Review of Energy Savings Plan by BPU completed within 14 days
- 11) Project initiation
- 12) Measurement and Verification sent to Entity and BPU

Prescriptive Incentives – Prequalified Technologies



- Electric Chillers
- Natural Gas Cooling
- Electric Unitary HVAC Systems & Controls
- Ground Source Heat Pumps
- Gas Heating
- Water Heating
- Lighting Controls

- Variable Frequency Drives VAV Systems or Chill Water Pumps
- NEMA Premium Motors*
- Prescriptive & Performance Lighting*
- Refrigeration Doors/Covers and Controls
- Food Service Equipment



Measurement & Verification 600 2014



	Entity	Projected Guaranteed Annual Savings	Actual Annual Savings	Percentage Difference
Johnson Controls Inc.				
	Barnegat 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%
Honeywell International Inc.				
	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%
Ameresco				
	Franklin Twp	\$99,134.00	\$103,543.00	104.44%
	Somerset Hills	\$345,944.00	\$352,647.00	101.93%
DCO	Manalapan	\$67,021.00	\$78,623.00	117.31%
Constellation				
	Newark Housing			
	Authority	\$4,212,128.00	\$9,411,792.00	123.45%
		\$8,918,577.00	\$14,719,845.00	113.22%

Methods of Finance



- Self Funding Bonds
- Lend Lease Purchase Borrowing

Methods of Revenue



- Energy Savings
 - Electric, Natural Gas, Heating fuel, Propane
- Operational Savings
 - Repair savings, replacement savings & manpower
- Clean Energy Incentives
- Power Purchase Agreements
- Demand Response

Power Purchase Agreements









PPA Solar Example





NJ Clean Energy Incentives



					Se
HOME	RESIDENTIAL	COMMERCIAL, IND	USTRIAL RNMENT	RENEWAR	BLE ENERGY
MMERCIAL, INDUSTRIAL D LOCAL GOVERNMENT	Home » Commercial & Industrial » Programs » NJ SmartStart Buildings				m Updates
PROGRAMS	NJ SmartStart Buildings Application Forms			 Program Admi Updates 	inistration Transi
NJ SMARTSTART BUILDINGS	To receive an equipment incentive, you must submit an application for the appropriate type of equipment, and a fully completed and signed accompanying worksheet (for Performance Lighting,			Combined Heat Cell Program I	Notice
EQUIPMENT INCENTIVES	Prescriptive Lighting, and Lighting Controls Applications only). Effective July 1, 2015 pre-approval is no longer required for prescriptive measures, with the			 Notice of NJ E Other updates pressure 	
FOOD SERVICE EQUIPMENT	exception of prescriptive & performance lighting, light applications. It should be noted that anyone who purc	ng controls and custom	measure		n Literature
APPLICATION	approval does so at his/her own risk.			riogram	in Enterentere
PROCEDURES	NEW! You may submit your application online! This method will allow you to track the status of your application, and if you create an account you will be able to link all subsequent applications for ease of tracking, autofill of basic contact information fields on subsequent applications, and copy applications. You are encouraged to set up an account if you will be submitting multiple				Application: and Brochur Download the Lat Program Material
QUICK START SIGNUP	applications. You are encouraged to set up an accour applications.	it ir you will be submitting	multiple		Plogram Materia
TAX CLEARANCE CERTIFICATE	Apply Online Instructions			Succe	ss Stories
TOOLS AND RESOURCES	Questions? Call us at 866-657-6278.				Library IV
PAY FOR PERFORMANCE	Incentive Applications				Restaurant New Lighting and H equipment for grea savings
COMBINED HEAT & POWER AND FUEL CELLS	Apply for any SmartStart Buildings	Incentive Online	e! Apply Now	\$ ()	savings
LOCAL GOVERNMENT ENERGY	Measure	Electronically Fillable	Printable PDF	Local Gov	t and Schoo
	Electric Chiller	(III)	应	-	financial incentives a
LARGE ENERGY USERS PROGRAM	Supplemental Measure Worksheet				available to
ENERGY SAVINGS IMPROVEMENT PROGRAM	Electric Unitary HVAC		团	Buoinese E	nergy Advis
DIRECT INSTALL	Food Service Equipment		國		
ENERGY BENCHMARKING	Gas Cooling		四		Learn more about energy use & saving
OIL, PROPANE, MUNICIPAL & COOP ELECTRIC CUSTOMERS	Gas Heating		四	V	in your indus
EDA PROGRAMS	Gas Water Heating	E	应	Subscribe	to eNewslett
SBC CREDIT PROGRAM	Ground Source Heat Pump		國		E-Newsletter
SUSTAINABLE JERSEY	Lighting Controls		四	\times	Subscribe for the Latest Rebate New
PAST PROGRAMS	Supplemental Measure Worksheet	2			
SUCCESS STORIES	Performance Lighting		2	F . II	
PROGRAM UPDATES	Supplemental Measure Worksheet			Follow Us:	t C

NJ Clean Energy Incentives



Pre-approval prior to installation is required.

Prescriptive Lighting Application - July 1, 2015 through June 30, 2016

Prescriptive Lighting Measures and Incentives

pare	 measures	and moentry

Linear Fluorescent Lighting - New Fixture				
Type of Existing Fixture	Wattage of Existing Fixture	Proposed Fixture	Incentive	
HID	> 750 Watts	T-5, T-8	\$150/fixture	
HID	400 - 750 Watts	T-5, T-8	\$100/fixture	
HID	250 - 399 Watts	T-5, T-8	\$50/fixture	
HID	< 250 Watts	T-5, T-8	\$25/fixture	
Line	ar Fluorescent Lighting - Retrofit of Ex	isting Fixture		
Measure		Incentive		
For retrofit or replacement of T-8 fixtures by permanent de-lamping & new reflectors - Electonic balast replacement required for all eligible de-lamped fixtures. Incentives for replacement/retrofit of T12 systems are not available		\$10 per fixture		
or retrofit) - Requires lamp and ballast replacement.			(1-4 lamps)	
	Induction Lighting Incentives			
Measure		Incentive		
HID (≥100w) fixture replaced with a new inductio - Replacement unit must use 30% less wattage per fixt	v) fixture replaced with a new induction fixture. ment unit must use 30% less wattage per fixture than existing HID system. \$70 per fixture		fixture	
HD (≥100w) fixture retrofitted with induction lamp power coupler and generator Replacement unit must use 30% less wattage per fixture than existing HID system.		\$50 per fixture		

LED LIGHTING INCENTIVES			
LED Fixture Categories Incentive rate is determined by the approved fixture category per DLC or EnergyStar ®. See Specific Program Requirement #7.			
LED Architectural Flood and Spot luminaires	\$50 per fixture		
LED Bollard Fixtures	\$50 per fixture		
LED display case lighting	\$30 per display case		
LED Fuel Pump canopy	\$100 per fixture		
LED High-Bay and low-Bay Fixtures for commercial & industrial Buildings	\$150 per fixture		
LED High-Bay-Aisle lighting	\$150 per fixture		
	2' fixtures - \$20/fixture		
	3' fixtures - \$30/fixture		
LED linear Ambient luminaires (indirect, indirect/direct, direct/indirect, direct)	4' fixtures - \$45/fixture		
	6' fixtures - \$60/fixture		
	8' fixtures - \$75/fixture		
LED Linear Replacement Lamps (2' & 4' only)	\$5 per lamp		
	1x4 LED (new or retrofit kit) - \$15/fixture		
LED Luminaires for Ambient lighting of interior commercial Spaces (1x4, 2x2, 2x4) - Incentive rates apply to both New fixtures and Retrofit Kits	2x2 LED (new or retrofit kit) - \$15/fixture		
- monthe rates upply to bein new interest and reacont rate	2x4 LED (new or retrofit kit) - \$25/fixture		
LED Outdoor Pole/Arm-mounted Area and Roadway luminaires (New or Retrofit)	\$100 per fixture		
LED Outdoor Pole/Arm-mounted decorative luminaires (New or Retrofit)	\$50 per fixture		
LED Outdoor wall-mounted Area luminaires	\$100 per fixture		
LED Parking garage luminaires	\$100 per fixture		
LED Retrofit Kits for Large Outdoor Pole/Arm-Mounted Area and Roadway Luminaires	\$150 per fixture		
LED Refrigerated/Freezer case lighting:	\$30 per 4' fixture		
incentive for replacement of fluorescent lighting systems in medium or low temperature	\$42 per 5' fixture		
display cases	\$65 per 6' fixture		

Key Links



- Clean Energy Incentives
- http://www.njcleanenergy.com/commerical-industrial/home/home
- ESIP information
- <u>http://www.njcleanenergy.com/commerical-industrial/programs/energy-savings-improvement-plan</u>
- Link to the ESIP legislation
- http://www.njleg.state.nj.us/2012/Bills/AL12/55.pdf

Contacts

- Mike Thulen / ESIP Coordinator esip@bpu.nj.gov
- Ed Mercer / State Energy Mgr. esip@bpu.nj.gov
- Gary Finger / Ombudsman esip@bpu.nj.gov

Optimizing New Jersey's Clean Energy Program for Local Governments

July 13, 2016

Tony O'Donnell Economist/Project Director Sustainable Jersey odonnela@tcnj.edu (609) 771-2921



Basic Process Steps

- Select LGU from list
- Profile generated based on TCNJ/NJIT Data
 - Size, building portfolio
 - NJCEP participation history
- Present questions for LGU to address:
 - Energy usage
 - Administrative capacity
 - Etc.
- Present Portfolio Matches



Pathways Matrix

	Quick Implementers	Mid-Range	DIY Bundlers	ESIP
(1) Unimplemented LGEA potential				
in dollars				
• <\$600K	Х			
• \$600K - \$1.5M		Х	X	Х
• >\$1.5M			x	X=outreach target
(2) Estimated Savings in dollars x #				
of buildings				
• <\$600K	Х			
• \$600K - \$1.5M		Х	X	Х
• >\$1.5M			X	X
(3) Peak Demand				
•0 to 200KW	X			
>200KW		Х	X	X
(4) Management preference				
•Low	X			
•Medium		Х	X	
•High			X	X



Four Pathways/Profiles

- **1.Quick Implementers**
- 2.Mid-Range
- 3.Do It Yourself Bundler
- 4.Clear ESIP Candidate



Profile for Quick Implementers

- Project Size Less than \$600,000
- No Buildings with Peak Demand >200 kW
- Limited Evidence of Upgrade Opportunities; no LGEA or LGEA with Limited Results
- Limited Administrative Capacity for Complex Programs



Recommended Path for Quick Implementers

- 1. An LGEA is not recommended.
- 2. Optimal strategy for these LGUs is effective use of the Direct Install program (with an audit-like walkthrough), probably focusing on lighting upgrades and advanced controls.
- 3. Encouragement should be provided for simple building upgrades, including weatherization, duct sealing, and simple insulation, and early replacement of aging capital equipment if budget allows
- 4. However, these "add ons" should not constrain pursuit of the easy upgrades that can be quickly realized through the DI program(s).



Profile for Mid Range

- Project Size Between \$600,000 and \$1,500,000
- Vague or Mixed Evidence of Upgrade Opportunities;
 Some Prior ECMs Implemented
- Limited Administrative Capacity for Complex Programs



- 1.A simple DI approach is probably inadequate by itself and so other CEP programs are appropriate for consideration.
- 2.Primary path is therefore completion of an LGEA (if one has not already been done)
- 3.Consideration of P4P, DI, or equipment upgrades in various combinations.
- 4.These LGUs are essentially implementing program level measures, without fuller consideration of a more comprehensive (and difficult) upgrade program.



Profile for Do It Yourself Bundler

- Project Size Between \$600,000 and \$1,500,000
- Good Evidence of Upgrade Opportunities; Possible LGEA Showing Unimplemented ECMs
- Strong Administrative Capacity and Appetite for Complex Programs



- 1.These LGUs essentially implement an "ESIP Light" without the significant overhead required of the larger ESIP program.
- 2.Optimal pathway is:
- complete an LGEA if it has not been done already, then
- based on LGEA findings, explore DI, P4P, and equipment upgrade programs.



Profile for Clear ESIP Candidate

- Project Size Greater Than \$1,500,000
- Strong Evidence of Upgrade Opportunities
- Strong Administrative Capacity and Appetite for Complex Programs



- 1.The optimal path for this segment is a full blown ESIP project with the goal of the most comprehensive upgrade bundle possible.
- 2.An LGEA should be done as a first step (if it hasn't been done already), followed by the ESIP RFP process.
- 3.ESIPs are good fits for larger schools and most counties (or municipal groups if aggregated together), but rarely work for small to medium sized municipalities or smaller "other" entities.



Questions?

• For further information, contact:

- Tony O'Donnell, Economist <u>odonnela@tcnj.edu</u> or 609-771-2921
- Nancy Quirk, Program Coordinator Advanced Infrastructure

<u>quirkn@tcnj.edu</u> or 609-771-2902



Upcoming Energy Webinars

- Get Plugged In: Actions and Incentives to Encourage Electric Vehicles
 - Tuesday, July 19th at 1 pm
 - Learn about NJDEP grant program for EV chargers
 - \$250 Grants for Level 1 charging stations
 - \$5,000 Grants for Level 2 charging stations
- Sustainable Jersey Solar Challenge
 - Wednesday, July 20th at 1 pm
 - Learn about the new Solar Challenge
 - \$10,000 award to the winning municipality!



