



Getting Started on Energy Actions: How Energy Savings Improvement Plans Fund Energy Upgrades

November 13, 2019



Webinar Panelists

Erica DeMichele

Delran School District

Arif Welcher

New Jersey Board for Public Utilities

Tracey Woods

Sustainable Jersey



Topics

Sustainable Jersey Energy Efficiency Actions

Energy Tracking and Management Action

Energy Efficiency for Municipal/School Facilities Actions

Overview of ESIP

Pairing Incentives with ESIP Financing

Models of ESIP

Case studies



Energy Tracking and Management Action

For base 10 points

- Building portfolio
 - Address
 - Date built
 - Square footage
 - Use
 - Schedule of occupancy
 - Utility account numbers
- Most recent twelve-months of energy use data for all buildings
 - Energy Star Portfolio Manager (ESPM)
 - Share ESPM Account with Sustainable Jersey

For additional 10 points

- Benchmarking report for each building in the inventory
 - ESPMor
 - NJCEP Benchmarking Report
- Demonstrate ongoing Energy Tracking and Management system
 - Identify staff responsible
 - Identify frequency (monthly, quarterly)



Share Your ESPM Account with Sustainable Jersey (sustainablejersey)

ENERGY STAR® Portfolio Manager®

MyPortfolio | Sharing | Reporting | Recognition

Add Contact

There are two ways to add a contact. First, search below to see if the contact you would like to add has a Portfolio Manager account. If you find the person, send a Connection Request, and when they accept the request, they will be added to your Contacts. Second, if the contact you would like to add does not have a Portfolio Manager account, then you can create an entry within your personal contacts.

Find Contact in Portfolio Manager

Search using any of the criteria below:

Name:

Organization:

Username:

Email:

Connecting with Other Users

If you think your contact already has an account in Portfolio Manager, search for them. If you find the person, send a Connection Request, and if they accept they will be added to your Contacts. You can easily [share your property](#) information with your contacts.

Keeping Personal Contacts

If the contact you want to add does not have a Portfolio Manager account, you can still add them as your personal contact.

ENERGY STAR® Portfolio Manager®

Welcome Account | Notifications | ENERGY STAR | Contacts | Help | Sign Out

SUSTAINABLEJERS EY: Settings Notifications

MyPortfolio | **Sharing** | Reporting | Recognition

My Shared Properties (0)

Sharing Notifications (0)

You have no new notifications.

Overview of Shared Properties [Learn more about Sharing Properties](#)

www.energystar.gov/sites/default/files/tools/How%20to%20Share%20Properties%20with%20Other%20Users%20in%20Portfolio%20Manager May%202019 Final 508.pdf

ENERGY STAR® Portfolio Manager®

Welcome zenontc: Account | Notifications | ENERGY STAR | Contacts | Help | Sign Out

Settings Notifications

MyPortfolio | **Sharing** | Reporting | Recognition

Share (or Edit Access to) Properties

Sometimes it's really important to be able to share your property with someone else. Maybe they need to help monitor your property, enter energy information (perhaps automatically) or process applications for recognition. If this sounds like what you need, start out by selecting the property(ies) that you'd like to share and who you'd like to share with them. If you have already shared properties, you can also use this form to edit people's access to your properties.

1 Select Properties

We'll get into the details of the level of access later. For now, which properties do you want to share with other users?

All Properties

2 Select People (Accounts)

Which people (accounts) do you want to share these properties with (or modify their current access to)? The access for each can be different and you'll be able to specify that on the next page.

Select contacts from my contacts book:

Sustainable Jersey (SUSTAINABLEJERSEY)

To select multiple contacts, hold down your Control (CTRL) key and click on each selection. Only your connected contacts appear in this list.

3 Choose Permissions

If you only need to choose one permission (because you are doing a single share or you want to give the same permissions for all of your shares), select "Bulk Sharing." If you need to assign different permissions or share with Data Exchange providers, select the 2nd option.

Bulk Sharing ("One-Size-Fits-All") - I only need to choose one permission (either Read Only Access or Full Access) and I want to choose the same permission for all of my share requests.

Read Only Access

Full Access

Custom Access (meters are all shared at the same level)

Exchange Data (You can share in bulk for exchanging data [here](#) or you can assign permissions one by one for each property using the radio button below.)

Remove Access

Personalized Sharing & Exchange Data ("Custom Orders") - I need to give different permissions for different share requests, and/or I need to give Exchange Data permission.

Sharing with Accounts

In order to share properties with others (either individuals or organizations), you need to be "connected" with them. To make a connection, go to the "Add Contact" or "Add Organization" page and search for them within Portfolio Manager (they need to have a Portfolio Manager account). Once you find them, send a "Connection" request. After they accept your connection request, they will show up on the list to the left.

Exchanging Data

To get started, first [connect with an organization that exchanges data](#). Once you are connected, their name will appear on the selection list on the left. Note: you can now share in bulk for [exchanging data](#).

Who gets to Share Forward?

Full Access - Automatically includes "Share Forward" rights

Read Only - Automatically does NOT include "Share Forward" rights

Custom - You decide, along with the individual permissions for property, meter, goals and recognition permissions.

Exchange Data - You decide, along with the individual permissions for property, meter, goals and recognition permissions.



Energy Efficiency for Facilities Action

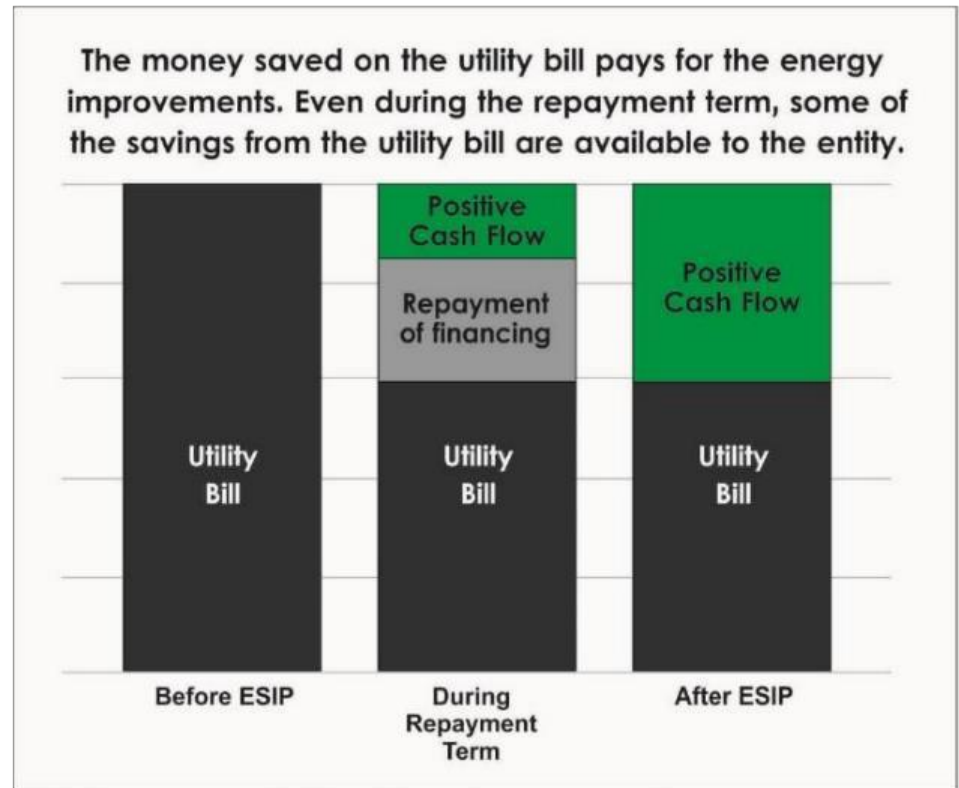
- **5 points** – ASHRAE Level 2 (LGEA) Audit on at least one building
- **10 points** - ASHRAE Level 2 (LGEA) Audit on at all buildings
- **15 points** – Upgrade work at least one building, 10% decrease use
- **20 points** - LGEA all buildings, PLUS Upgrade one building 10% decrease
- **30 points** - Efficiency upgrades; 10%-19% decreased energy use
- **40 points** - Efficiency upgrades; 20%-29% decreased energy use
- **50 points** - Efficiency upgrades; at least 30% decreased energy use



What is an ESIP?

Energy Savings Improvement Plan

- Financing mechanism that funds energy conservation measures with energy savings
- ESIP financing does not add to debt load of entity
- No negative cash flow- each year of the project must be cash positive
- Maximum payback period is 15 years, 20 years for projects with CHP



Adapted from a chart created by SmartWatt. <https://www.smartwatt.com/what-is-a-performance-contract/>

Delran School District ESIP, 50 Points

	Baseline Energy Usage Data from Energy Audit Date -----> ----->				Energy Usage Data Most recent 12 months Dated-----> ----->							
				12/1/2016					8/1/2018			
Building	Building area in square feet	Enter your grid purchased electricity (kWh) in this column	Enter your natural gas (therms) in this column	total kbtu per month	Baseline EUI	Enter your grid purchased electricity (kWh) in this column	Enter your natural gas (therms) in this column	Enter your on-site generated electricity (kWh) into this column	total kbtu per month	Current EUI	% Change EUI in Facility	Weighted
High School	138,441	2,148,692	79,690	31,394,595	226.8	926,076	65,720	688,118	19,173,737	138.5	-38.9%	-14.37%
Intermediate School	64,444	915,059	18,950	11,796,273	183.0	451,275	23,880	310,942	8,404,878	130.4	-28.7%	-4.94%
Elementary School	74,014	564,767	22,050	8,367,756	113.1	240,434	29,340	165,310	6,221,591	84.1	-25.6%	-5.06%
Middle School	98,123	876,469	47,450	14,375,211	146.5	342,055	48,840	315,558	9,870,941	100.6	-31.3%	-8.20%
												-32.57%
Adapted from Solar Oregon's site EUI calculator for homes http://solaroregon.org/downloads/eui-calculator/view												

- 50 Points – Energy Efficiency for School Facilities
- 30 Points – On-site Solar
- 20 Points – Energy Tracking and Management



Delran Township School District

Energy Savings Improvement Program

Erica DeMichele, Delran School District



Achieving the District's Key Capital Goals

through a budget-neutral Energy Savings Improvement Program

Energy Conservation Measure (ECM)	Delran High School	Delran Middle School	Delran Intermediate School	Millbridge Elementary School
Hot Water Pump Variable Frequency Drives & Control Valve Upgrades				
Building Automation System (BAS) Upgrade				
Rooftop Unit (RTU) Upgrade with AC - Music Room				
Retro-commissioning - D Wing				
Lighting Upgrade - Interior				
Lighting Upgrade - Exterior				
Urinal Replacement - Faculty Lounge & Boys Locker Room				
Building Envelope Upgrades				
Walk-In Cooler & Freezer Controls				
Vending Misers				
Plug Load Controllers				
Solar Power Purchase Agreement (PPA)				
Water Conservation				

Financial Impact

Annual Savings:

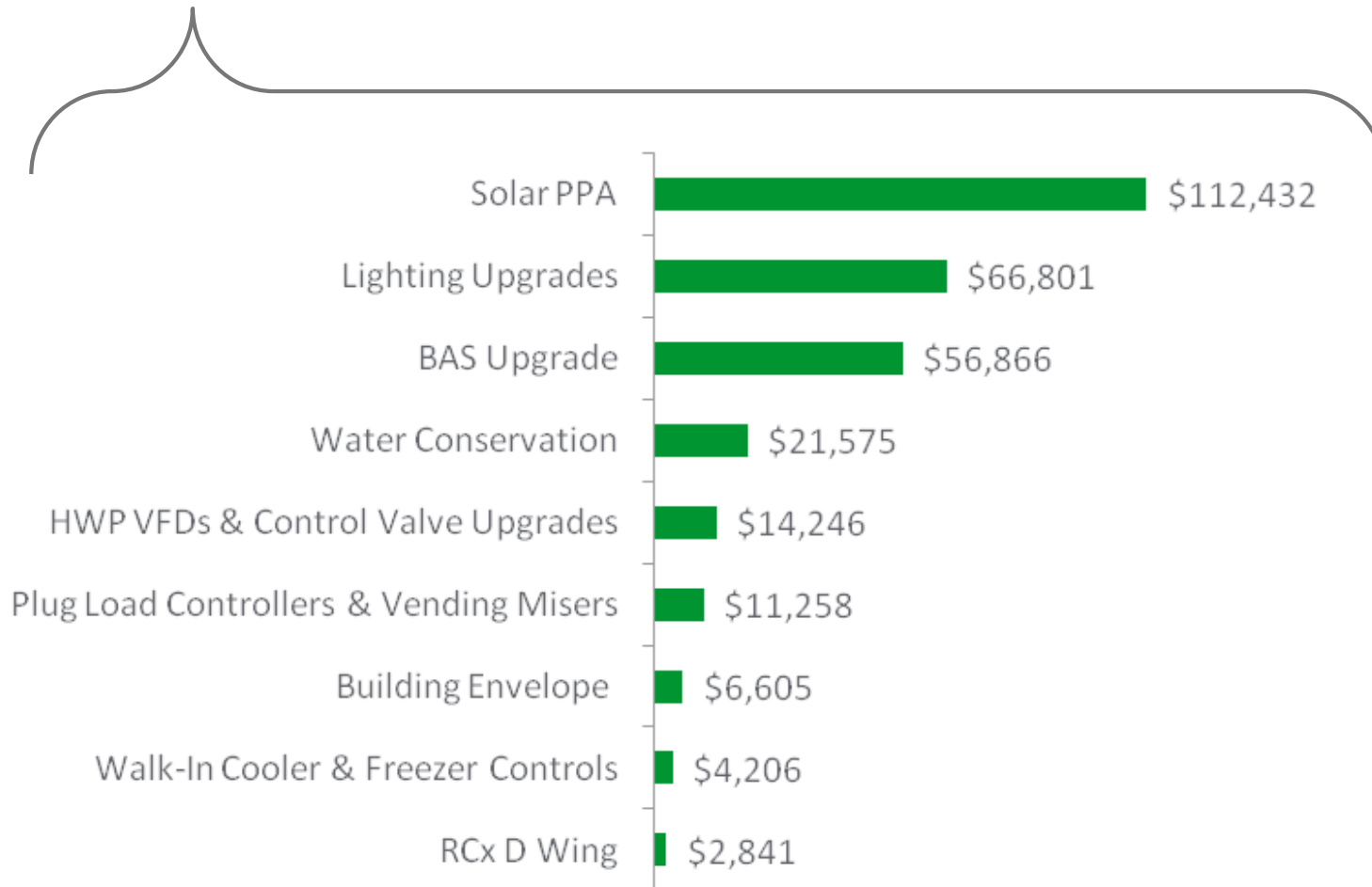
\$283,343

Anticipated Incentives:

\$325,555

Project Cost:

\$4,512,672



Solar PV Deployment by School

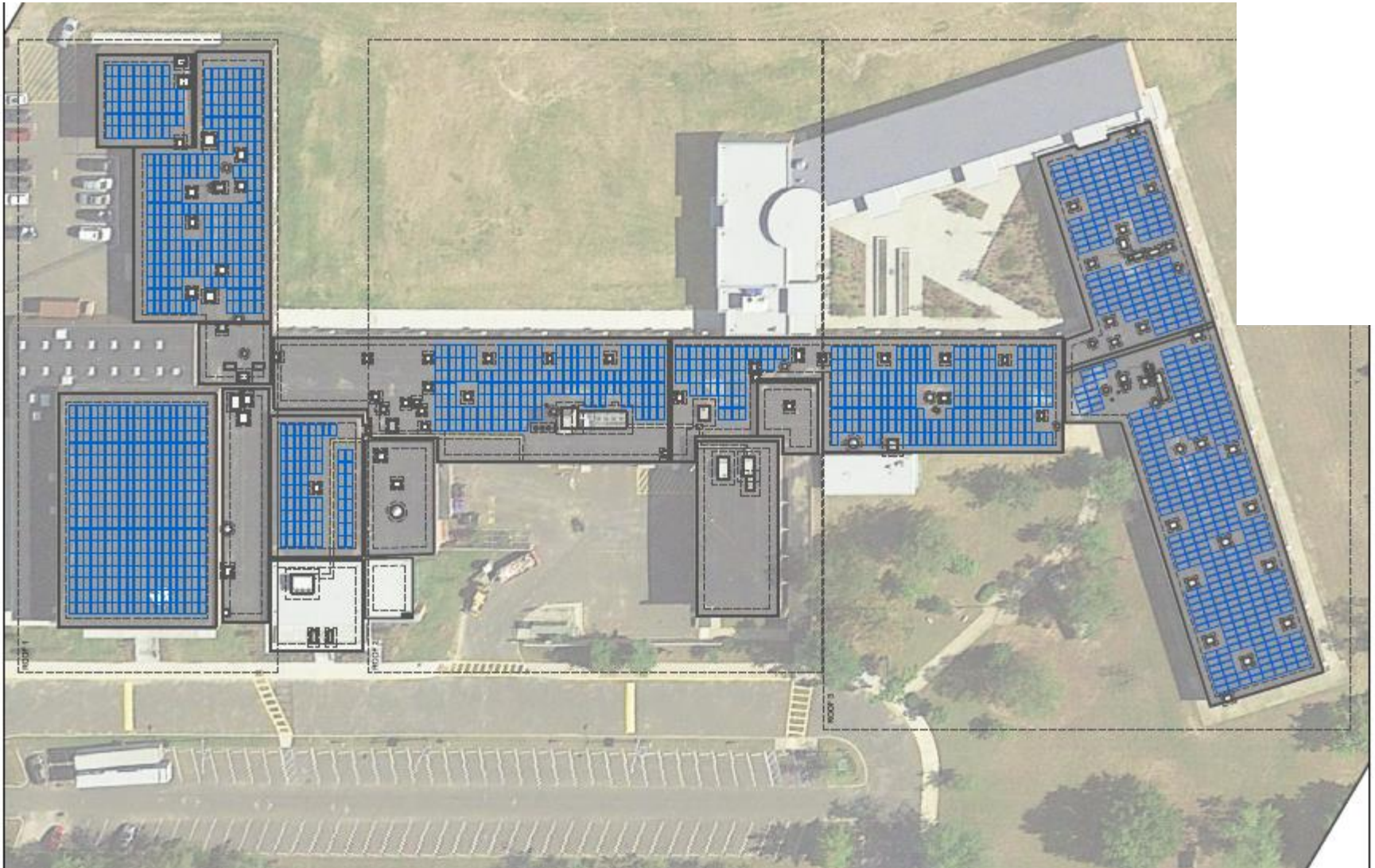
School	System Size
High School	908.8 kW
Middle School	531.6 kW
Intermediate School	355.8 kW
Elementary School	316.2 kW
Total	2,112 kW

- > Current electric: \$0.1258 - \$0.1276/kWh (not including demand)
- > PPA Option: \$0.084 with 2.2% Escalator
- > **Results:**
 - > \$112,000 in Year 1 Savings
 - > \$1.8M in ESIP scope
 - > 83% electric offset
 - > New roofs at High School and Millbridge

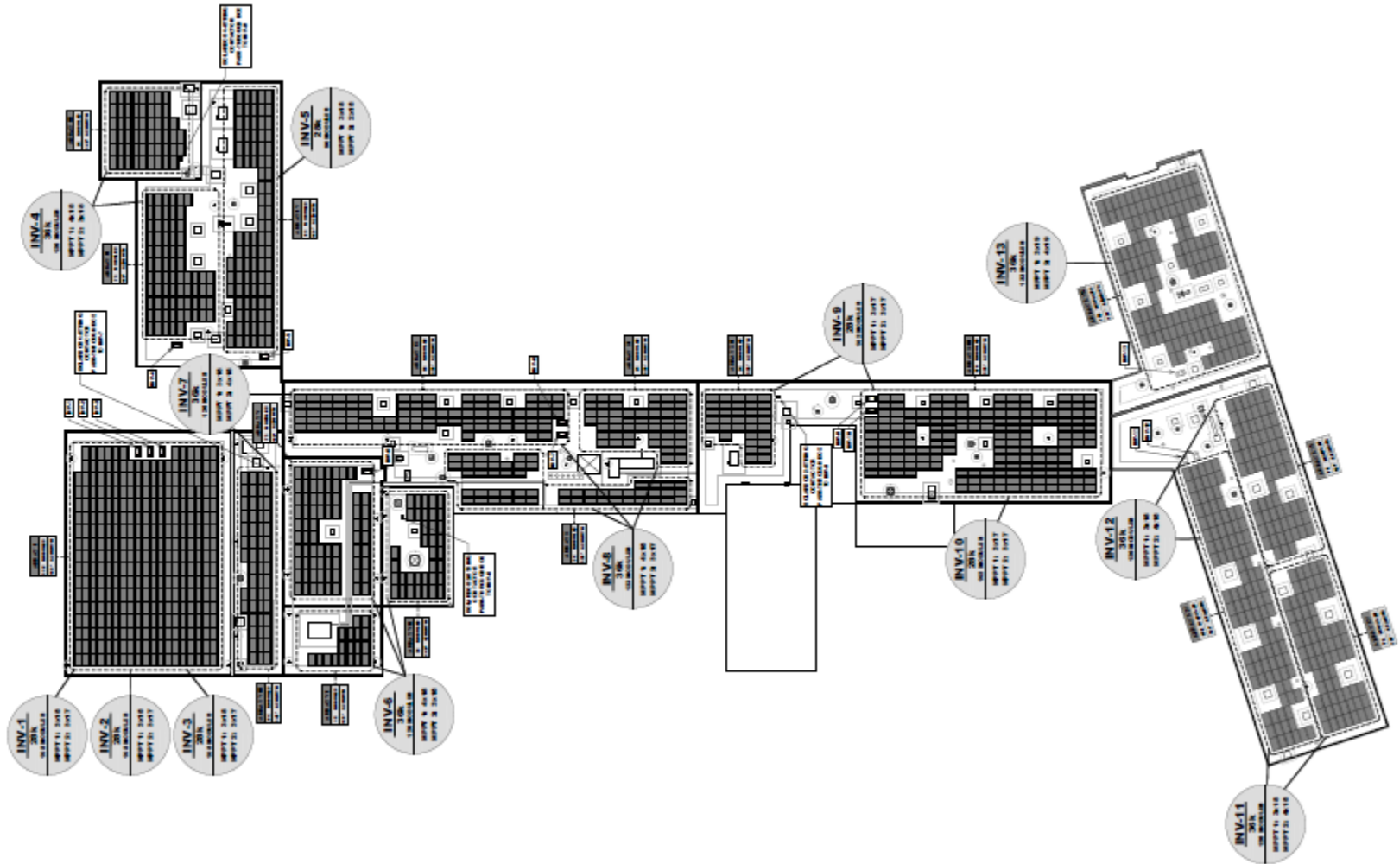
High School



Middle School



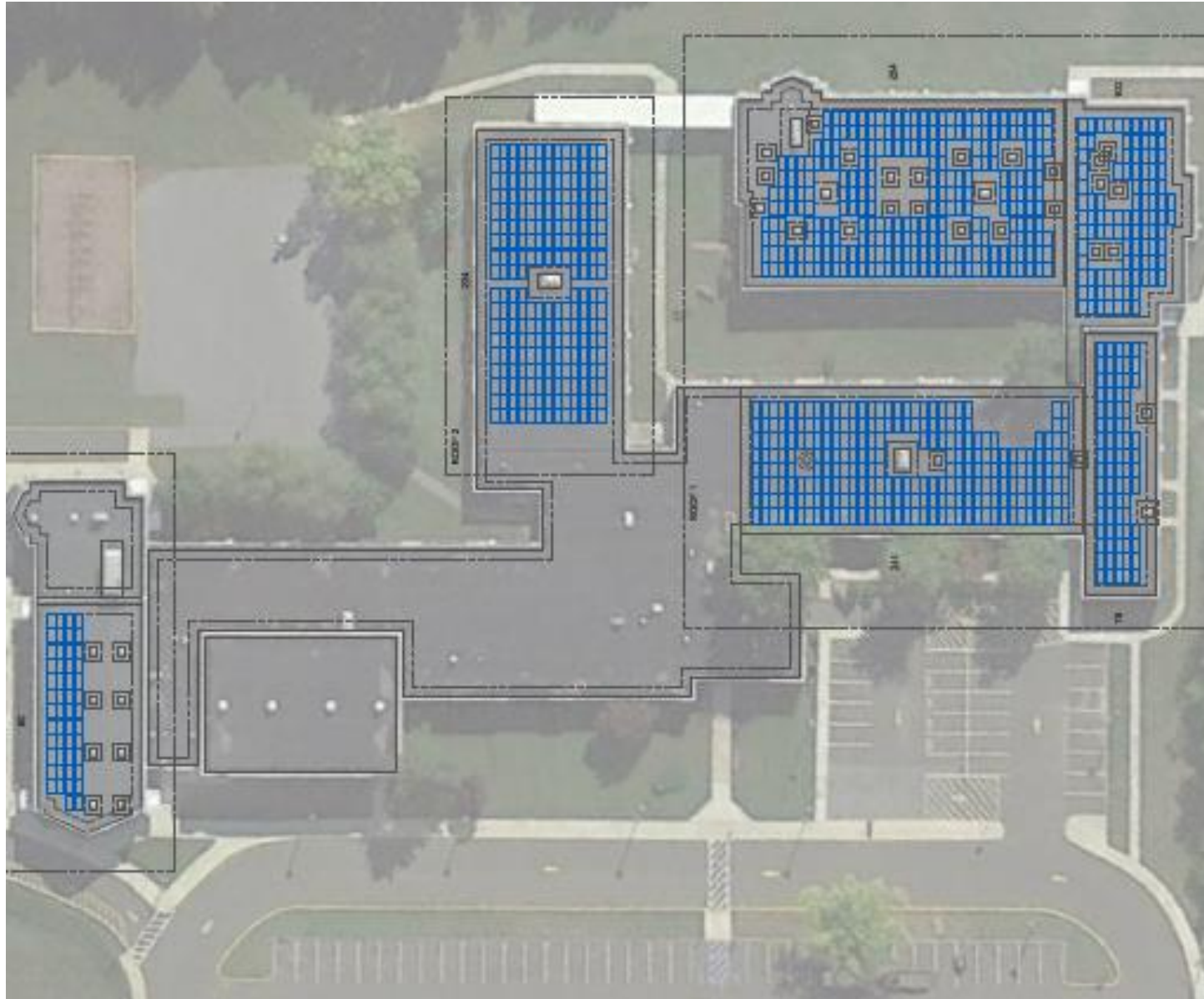
Middle School

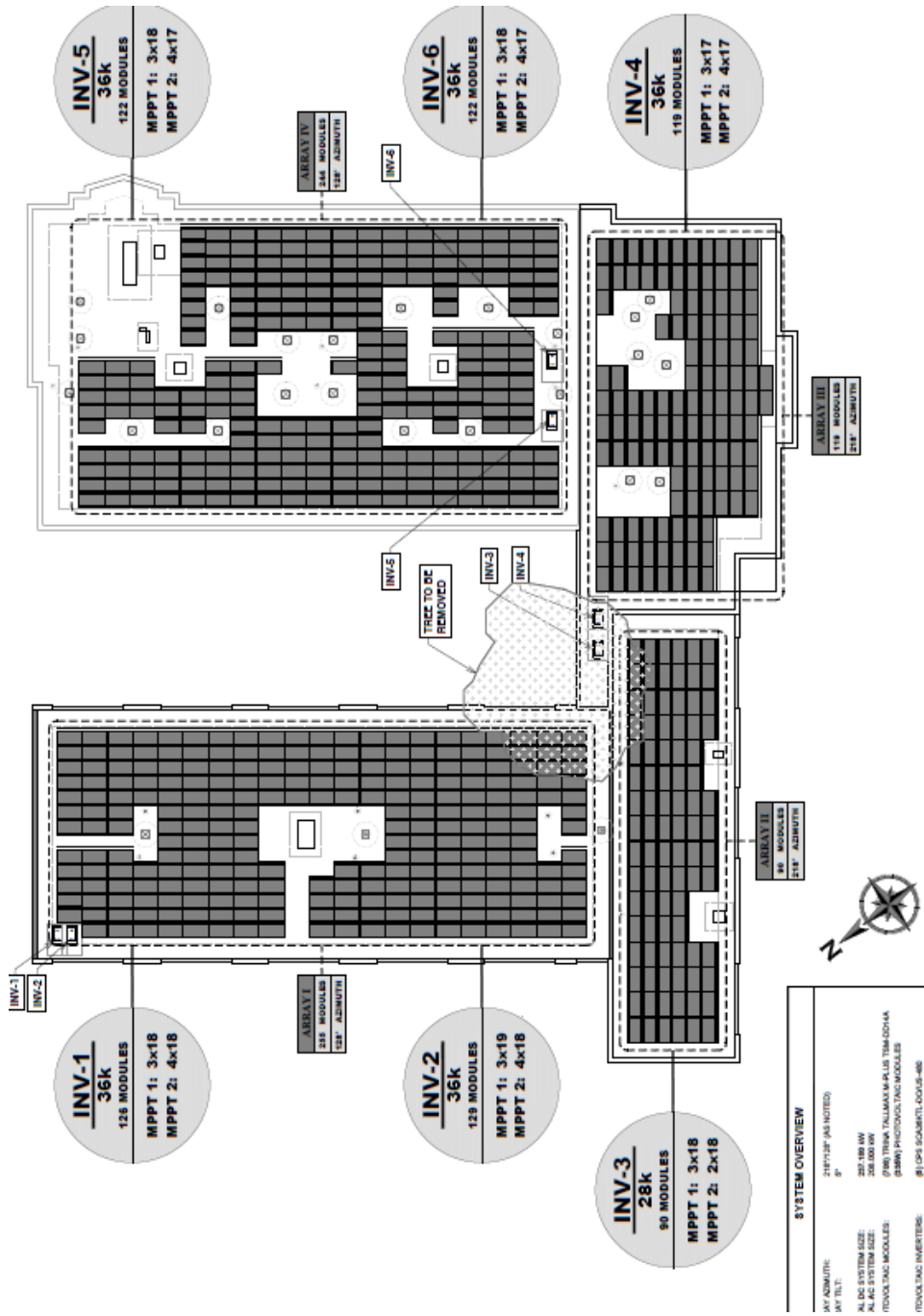


Intermediate School



Elementary School





Value to Delran Township School District

- > **\$4.5+ M of capital improvements**
with no increase in the budget
- > **Improved learning environment**
through upgrades to BAS, HVAC, and lighting systems
- > **Increased awareness**
Through an energy dashboard system & marketing program
- > **Sustainability**
With 80% of electricity use from onsite solar PV



From the School District's Point of View



Energy Savings Improvement Plan

ESIP How-To Guide

- Case Studies
- Flow chart
- Contracting options
- Glossary

How to Implement an Energy Savings Improvement Plan
Sustainable Jersey How-To Guide, V.2



Sustainable Jersey
Sustainability Institute at The College of New Jersey
Forcina Hall, 3rd Floor
2000 Pennington Rd.
Ewing, NJ 08628-0718

<http://www.sustainablejersey.com/grants-resources/publications/>



Overview of the ESIP Process

Energy Audit Local Government Energy Audit (LGEA)
Determine Method of Implementation
Investment Grade Audit
Drafting of the Energy Savings Plan
Approval of the Energy Savings Plan Financing
Construction
Commissioning



Local Government Energy Audit

Level 2 Energy Audit

- Local Government Energy Audit (LGEA)
- The local government unit must submit 14 months of utility bills as part of the LGEA application process



Determine Method of Implementation

- **Option A: Energy Service Company (ESCO)**
Hire an ESCO from a prequalified DPMC list
- **Option B: Do it Yourself (DIY)**
Local government unit can hire a consultant or use in-house capacity to lead the ESIP process
- **Option C: Hybrid**
Combination of the ESCO and DIY Plans

What's an ESCO?

In ESIP, Energy Service Companies or ESCOs are companies approved by the NJ Department of Property Management and Construction to develop, design, build, and fund ESIP projects.



Investment Grade Audit/Energy Savings Plan

Investment Grade Audit

- Cost paid by entity, or rolled into ESIP funding if project proceeds
- Verified by independent third party

For larger projects, an RFP may be advisable for selecting a verification service

Energy Savings Plan

- Description of the energy conservation measures/cost
- Details of incentives/funding
- Estimate of greenhouse gas reductions

TIP: Discuss priorities of the entity before Investment Grade Audit.



Incentives

New Jersey's Clean Energy Program & ESIP Interaction

ESIP Process

New Jersey's Clean Energy Program Interaction

Initial Energy Audit completed
for entity building(s)

Local Government Energy Audit
(LGEA) may be used to meet
this requirement

Entity issues ESIP RFP
(previously approved by BPU) and
selects ESCO or DIY approach

Investment Grade Energy Audit
completed and Energy Savings
Plan (ESP) developed

P4P Energy Reduction Plan (ERP),
Direct Install, or SmartStart
application recommended
submittal time frame

Third party review of ESP

Review and approval of ESP
by Board of Public Utilities (BPU)

Entity adopts ESP,
determines guarantee

ESIP is designed to
pair with NJCEP
incentives

Image source: njcleanenergy.com/commercial-industrial/programs/energy-savings-improvement-program

ESIP Financing Options

Refunding Bond and Lease Purchase Agreements

In both financing options:

- Does not add to the debt load of the entity
- Funding repayment term must not exceed estimated useful life measures
- Repayments of these ESIP financing classed as utility expenses

Strategies for ESIP

Multi-entity ESIP

Cape May City and Cape May School District

Joint-entity ESIPs:

- Require a single financing entity
- Help smaller entities get more ESCO interest



Cape May's ESIP-School District plus Municipal

Building	Building area in square feet	Baseline Energy Usage Data from Energy Audit Date ----->		total kbtu per month	Baseline EUI	Potential Savings identified from Energy Audit		total kbtu per month after energy upgrades	EUI after Energy Upgrades	% Change EUI in Facility	Weighted
		Enter your grid purchased electricity (kWh) in this column	Enter your natural gas (therms) in this column			Enter potential electricity savings from ECMs (kWh) in this column	Enter potential natural gas savings from ECMs (therms) in this column				
City Hall	22,479	272,704	2,376	3171999.68	141.11	55,306	1,788	2391555.23	106.39	-0.25	-0.06
Franklin Street School	10,676	9,463	1,875	298288.27	27.94	4,249	1,165	130427.50	12.22	-0.56	-0.06
Welcome Center	2000	50,877	1,496	702319.65	205.36	17,709	1,237	382650.49	111.89	-0.46	-0.02
Water Works Building	3,420	1,624,600	2,544	17677665.77	8838.83	3,092	228	17620589.36	8810.29	0.00	0.00
Fire House	2,000	120,160	4,110	1719283.09	251.36	20,440	1,131	1381476.29	201.97	-0.20	-0.01
Public Works Complex	6,840	18,160	10,719	1320112.45	317.03	4,460	1,131	1153560.43	277.03	-0.13	-0.01
Library	4,164	58,591	1,931	830664.20	199.49	17,904	103	627975.26	150.81	-0.24	-0.01
Nature Center 1	1,296	5,291		56702.69	43.75	4,462	0	8884.24	6.86	-0.84	-0.01
Nature Center 2	1,876	5,286	1,065	168474.11	89.80	4,446	875	28952.13	15.43	-0.83	-0.02
Elementary School	43,560	220,600	17,300	4180630.49	95.97	121,070	878	2790955.09	64.07	-0.33	-0.15
Street Lights		62,530				35,910	0				
		2,448,262	43,416			289,048	8,536				-33.68%
Adapted from Solar Oregon's site EUI calculator for homes http://solaroregon.org/downloads/eui-calculator/view											

Cape May Case Study

Energy Conservation Measures*

- Building Management System –
 - City Hall, Library & Welcome/ Transportation Center \$88,518
- Programmable thermostats installation - smaller buildings
- Emergency generator at school - \$308,174
- Building envelope improvements in seven buildings
- Walk-in cooler controls at school - \$3,082

* Selected Measures, full list available at <http://sj-site-persistent-prod.s3.amazonaws.com/fileadmin/cicbase/documents/2017/11/2/15096439418002.pdf>



Cape May Case Study

Incentives/Rebates:

- Demand Response – Energy Efficiency Credit \$3,472
- NJ Smart Start Rebates – LED Lighting Replacement/Retrofits \$34,570

Total Incentives \$38,042



Cape May Welcome Center, one of the buildings included in ESIP.
<https://www.capemay.com/plan-your-visit>



Cape May's ESIP-School District plus Municipal

FORM VI

**ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ESCO's PRELIMINARY ANNUAL CASH FLOW ANALYSIS FORM
CITY OF CAPE MAY - ENERGY SAVING IMPROVEMENT PROGRAM**

ESCO NAME: Johnson Controls

Note: Respondents must use the following assumptions in all financial calculations:

(a) The cost of all types of energy should be assumed to inflate at **2.4% gas, 2.2% electric per year**; and

1. Term of Agreement: **15 years (180 Months)**
2. Construction Period ⁽²⁾ (months): **12 months**
3. Cash Flow Analysis Format:

Project Cost ⁽¹⁾: \$786,709

Interest Rate to Be Used for Proposal Purposes: 3.25%

Year	Annual Energy Savings	Annual Operational Savings	Energy Rebates/ Incentives	Total Annual Savings	Annual Project Costs	Board Costs	Annual Service Costs ⁽³⁾	Net Cash Flow to Client	Cumulative Cash Flow
Installation	\$4,393	\$0	\$0	\$4,393	\$0	\$0	\$0	\$4,393	\$4,393
1	\$53,897	\$9,412	\$35,126	\$98,434	\$92,614	\$97,645	\$5,031	\$790	\$5,182
2	\$55,107	\$9,412	\$688	\$65,206	\$59,115	\$64,397	\$5,283	\$809	\$5,991
3	\$56,344	\$9,412	\$1,585	\$67,340	\$60,954	\$66,501	\$5,547	\$840	\$6,831
4	\$57,609	\$9,412	\$643	\$67,664	\$66,819	\$66,819	\$0	\$845	\$7,676
5	\$58,902	\$9,412	\$0	\$68,314	\$67,460	\$67,460	\$0	\$854	\$8,530
6	\$60,225	\$0	\$0	\$60,225	\$59,352	\$59,352	\$0	\$873	\$9,403
7	\$61,577	\$0	\$0	\$61,577	\$60,684	\$60,684	\$0	\$893	\$10,296
8	\$62,960	\$0	\$0	\$62,960	\$62,047	\$62,047	\$0	\$913	\$11,209
9	\$64,374	\$0	\$0	\$64,374	\$63,440	\$63,440	\$0	\$933	\$12,143
10	\$65,819	\$0	\$0	\$65,819	\$64,865	\$64,865	\$0	\$954	\$13,097
11	\$67,297	\$0	\$0	\$67,297	\$66,322	\$66,322	\$0	\$976	\$14,073
12	\$68,809	\$0	\$0	\$68,809	\$67,811	\$67,811	\$0	\$998	\$15,070
13	\$70,354	\$0	\$0	\$70,354	\$69,334	\$69,334	\$0	\$1,020	\$16,091
14	\$71,934	\$0	\$0	\$71,934	\$70,891	\$70,891	\$0	\$1,043	\$17,134
15	\$73,550	\$0	\$0	\$73,550	\$72,296	\$72,296	\$0	\$1,254	\$18,387
Totals	\$953,150	\$47,058	\$38,042	\$1,038,250	\$1,004,003	\$1,019,863	\$15,860	\$18,387	\$18,387

NOTES:

(1) Includes: Hard costs and project service fees defined in ESCO's PROPOSED "FORM V"

Municipal Utility Authority ESIP

- Wastewater processing is VERY energy intensive
- ESIP can be used to upgrade MUA equipment and reduce energy usage

Polls



Denville School District

- 2015 - \$1.8M ESIP
- 1.2M pounds of greenhouse gas (GHG) emissions reduction
- Project will result in \$85,226 additional energy savings over 15 years
- \$92,637 in rebates and incentives, Smart Start program

ECM	ECM Description	Valleyview Middle School	Lakeview Elementary School	Riverview Elementary School	Bus Garage
1a	Lighting Upgrades - LED	✓	✓	✓	✓
1b	Vending Misers	✓	✓	✓	
1c	Destratification Fans	✓	✓	✓	
1d	Plug Load Management via Wi-Fi	✓	✓	✓	
2a	Boiler Replacements		✓		
2b	Boiler Burner Controls			✓	
2c	Rooftop Unit Replacement	✓	✓	✓	
2d	Premium Efficiency Motors and VFDs		✓	✓	
2e	Steam Trap Replacement			✓	
2f	Pipe Insulation			✓	
2g	Domestic Hot Water Replacements	✓	✓		
2h	Split System Replacements	✓		✓	
2i	Window AC Unit Replacements				
2j	Unit Heater Replacements				✓
3a	Building Management System Upgrades	✓	✓	✓	
3b	Demand Control Ventilation	✓	✓	✓	
3c	Energy Monitoring and Education	✓	✓	✓	
4a	Building Envelope Improvements	✓	✓	✓	✓
4b	Roof Replacements	✓			
5a	Computer Power Management	✓	✓	✓	
6a	Water Conservation	✓	✓	✓	
7a	Demand Response/Permanent Load Reduction	✓	✓	✓	
7b	Energy Sourcing	✓	✓	✓	
8a	Renewable Energy – Solar PPA System	✓	✓	✓	

List of Energy Conservation Measures included in the Denville School District Energy Savings Plan



Great Meadows Regional School District

- In 2015- \$2.6M energy savings program
- \$176,000 in New Jersey's Clean Energy Program rebates and incentives
- 328K pounds of greenhouse gas emissions reduction
- Savings in excess of project cost: \$152,637 over the 15 year term



Newark Public Schools

- Six Newark schools, \$1.52M in incentives through NJCEP's Pay for Performance program
- Energy saving 3.94 gWh of electricity / 351,000 therms of natural gas
- Projected energy savings in excess of project cost: \$72,584 over the 15 year term



Old Bridge Public Schools

- 2017, \$16.1M ESIP
- \$1.8M in Incentives from NJCEP, Pay for Performance
- ESCO prepared bid documents for a solar PPA, providing 35% of District's electrical
- Reduce greenhouse gas (GHG) emissions - 1.2M pounds
- Projected energy savings in excess of project cost: \$373,456 over the 15 year term



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Program Underwriters



Grants Program



Corporate Sponsors

* 10th Anniversary Sponsors

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Sustainable Jersey for Schools Supporters & Sponsors

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Grants Program



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BRONZE



Upcoming Events

Webinar

Residential Energy Efficiency Outreach Campaigns,
a Guide for Municipalities and Green Teams
December 4, 2019 @ 1 PM – 2 PM

Implementing Complete Streets at the Local Level-Free Training
January 9, 2019 @ 9:30 AM – 4:00 PM
Rowan College of South Jersey, Cumberland Campus
3322 College Drive, Vineland, NJ 08360

Registration on Events page of SustainableJersey.com



Sustainable Jersey Annual Luncheon

Tuesday, November 19, 2019

12:00pm – 1:45pm

The Crown Ballroom, Sheraton Convention Center Hotel, Atlantic City

Highlights:

- Pre-Luncheon Networking Session (10:30am - Noon) **Certifying communities should arrive early to have their group photo taken prior to the start of the luncheon*
- Luncheon (Noon – 1:45pm)
- Recognition of the 2019 Sustainable Jersey Certified Communities
- Conveyance of Special Awards



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