



# Sustainable Jersey

Bronze, Silver, or Gold?  
Success Stories in Municipal Energy Efficiency

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Sustainable Jersey

# Municipal Program Energy Actions

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



# Gold Star Standard in Energy

## Municipal Emissions Standard

- operations / facilities
- buildings, exterior lighting, fleets

## Community Emissions Standard

- community-wide greenhouse gas (GHG) emissions



The screenshot shows the Sustainable Jersey website homepage. At the top, there is a navigation bar with a search box, social media icons (Facebook, Twitter, Instagram, LinkedIn), and a 'REGISTER' button. Below the navigation bar is a main banner featuring a row of gold stars of increasing size, with the text 'REACH FOR THE STARS! Learn about Sustainable Jersey's new Gold Star Standards in Energy and Waste'. The main content area is divided into three columns: 'ABOUT SUSTAINABLE JERSEY' (describing the organization's mission), 'PARTICIPATING COMMUNITIES' (showing a map of New Jersey with location pins), and 'HEADLINES' (listing recent news items like '2017 NJ Sustainability Summit to Focus on Local Action = Collective Impact' and 'Environmental Defense Fund Fellows Matched with Monmouth County Towns and School Districts to Advance Sustainable Energy Projects').



# Energy Tracking & Management (ET&M)

- Good energy usage information is critical to identifying and prioritizing potential building performance improvement opportunities
- Once upgrades are undertaken, an ET&M system is essential to tracking the actual impact of any upgrade investments that are made
- The importance of energy tracking and management extends far past the initial set-up phase. It is a continuous process that allows for active management of your facilities.

# Benchmarking

- Comparing your energy usage to your own historical data only gives a part of the picture
- Benchmarking allows building managers to see how their energy usage compares to similar buildings
- Benchmarking adjusts for weather-related issues and can help you identify underperforming buildings so that you can properly prioritize facilities upgrades
- In NJ, it's free!!

**Financial Incentives for Energy Efficiency**

**Your First Step to Saving Energy is Easy...and FREE**

We needed to take control of our building's rising energy costs, so we started with a FREE Benchmarking Report from *New Jersey's Clean Energy Program™*. They showed us how we compared to similar buildings and gave us an idea of where we needed to upgrade first.

***That's setting a benchmark for saving energy...and money!***

BPU Clean Energy



# Energy Audits

- Energy audits are the best first step to assess the performance of your facilities in regards to energy use
- The SJ action requires an ASHRAE Level 2 audit to be performed
- ASHRAE Level 2 audits include an in-depth analysis of energy costs, energy usage and building characteristics and offer specific recommended Energy Conservation Measures (ECMs) that can reduce facility energy consumption.
- In NJ, the Local Government Energy Audit offers this type of audit and is 100% cost-free to municipalities!



# Energy Efficiency for Facilities

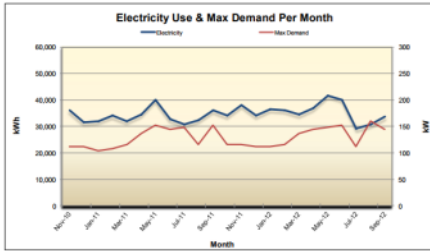


- **5 points** - Audit on at least one building
- **10 points** - Local Government Energy Audit (LGEA) that covers all buildings
- **15 points** – Significant upgrade work (at least 10% cost savings demonstrated)
- **20 points** - LGEA that covers all buildings PLUS significant upgrade work
  - at least 10% demonstrated cost savings for one building
- **30 points** – Efficiency upgrades with 10%-19% decrease in energy consumption
- **40 points** – Efficiency upgrades with 20%-29% decrease in energy consumption
- **50 points** - Efficiency upgrades with at least 30% decrease in energy consumption

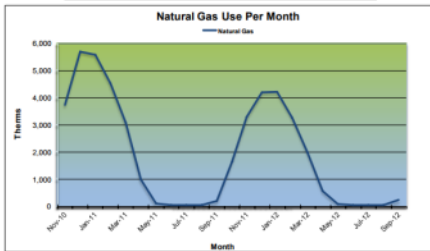


# NJCEP Incentives for Local Governments

Monthly Electricity Use & Max Demand For Example Elementary School



Monthly Natural Gas Use For Example Elementary School



TRC Energy Services is under contract to NJCEP as the Market Manager for this Energy Performance Benchmarking Program.

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Example NJ Elementary School

December 2012

- Local government units
  - Municipalities
  - Schools
  - Water treatment/wastewater
  - First responders
  - Community centers
  - Recreation facilities
- Programs
  - Local Government Energy Audit
  - Direct Install
  - Smart Start
  - Pay For Performance
  - Free Energy Benchmarking



## Local Government Energy Audit: Energy Audit Report



### Municipal Building

Borough of Folsom  
1700 12th Street  
Folsom, NJ 08037  
October 14, 2016



# Success Story #1: Denville Township

## NJCEP & Sustainable Jersey Timeline

- Local Government Energy Audit in 2009
- Has utilized Energy Tracking & Management system using Portfolio Manager since 2012
- Direct Install upgrades in 2011, 2013, & 2017
- Certified in 2017 with 380 points (including 15 for the new *Energy Efficiency for Municipal Buildings* action)



## Energy Savings Impact

- Total dollars spent on electricity in 2010: \$200,816
- Total dollars spent on electricity in 2016: \$160,734
- Change between 2010 to 2016: **20% reduction**



# Denville – ET&M Documentation

My Portfolio: Denville Township						
03/01/2018 12:15 PM EST						
Total Properties: 6						
Property Name	Portfolio Manager ID	Property Use Name	Use Type	Gross Floor Area for Use	Gross Floor Area Units	Gross Floor Area Temporary Value? (Y/N)
Township of Denville Municipal Building	4022819	Building Use	Other	27,000	Sq. Ft.	No
Denville Museum	4045698	Building Use	Museum	2,000	Sq. Ft.	No
Senior Center	4046774	Building Use	Social/Meeting Hall	2,000	Sq. Ft.	No
Vehicle Service/Parking	4046788	Building Use	Repair Services (Vehicle, Shoe, Locksmith, etc.)	2,000	Sq. Ft.	No
Valleyview Firehouse	4046792	Building Use	Fire Station	4,000	Sq. Ft.	No
Main St. Firehouse	4046794	Building Use	Fire Station	5,000	Sq. Ft.	No



# Denville Engagement with NJ Clean Energy Program

Program	Applicant	Premise Sq. Ft	Street Address Line 1	App Status Date	Ann. Elec Savings (KWh)
Local Government Energy Audit	Denville, Township of	28,000	Municipal Government Offices and Courtroom 1 Saint Mary's Place	2/13/2009	
Local Government Energy Audit	Denville, Township of	13,000	Firehouse, Garage-Office and Conference Room 2 Indian Road	2/13/2009	
Direct Install	Denville, Township of	3,600	Firehouse 2 Indian Road	9/8/2011	43,814.64
Direct Install	Denville, Township of	1,500	Senior Center Route 53 - Hall Avenue	9/8/2011	23,129.34
Direct Install	Denville, Township of	11,368	Public Library 121 Diamond Spring Road	10/6/2011	17,108.65
Direct Install	Denville, Township of	8,000	DPW 140 Morris Avenue	10/6/2011	16,618.92
Direct Install	Denville, Township of	34,000	Municipal Building 1 St Mary's Place	11/3/2011	54,559.10
Direct Install	Denville, Township of		Union Hill Firehouse Franklin Rd	2/5/2013	14,759.06
Direct Install	Denville, Township of		Denville/Firehouse 2 Indian Rd	2/5/2013	14,006.13
Direct Install	Denville, Township of		Denville-DPW 140 Morris Ave	2/28/2013	38,055.55
Direct Install	Denville, Township of	34,000	1 St Mary's Place	6/14/2017	81,386.00
Direct Install	Denville, Township of	11,368	121 Diamond Spring Road	6/14/2017	37,568.00
Direct Install	Denville, Township of		100 East Main St	6/14/2017	8,945.00



Total Annual Savings from 2011 DI upgrades: 155,230 kWhrs  
 Total Annual Savings from 2013 DI upgrades: 66,821 kWhrs  
 Total Annual Savings from 2017 DI upgrades: 127,899 kWhrs  
**Total Annual Savings for all upgrades: 349,950 kWhrs**

At 11 cents per kWhr, that equals  
 Approximately \$38,500 annual electric savings



# Success Story #2: Bernards Township

## NJCEP & Sustainable Jersey Timeline

- Local Government Energy Audit on 13 buildings in 2011
- Direct Install upgrades in 2011 & 2017
- Smart Start upgrades in 2014
- Certified in 2016 with 380 points (including 50 for the former *Inventory & Upgrade All Buildings* action)



# Bernards Engagement with NJ Clean Energy Program

Program	Premise Sq. Ft	Street Address Line 1	Date	Ann. Elec Savings (KWh)
Direct Install	21,643	1 Collyer Lane	7/6/2017	65,698.00
Direct Install		289 South Maple Avenue	6/30/2017	7,063.00
Direct Install	10,000	1 Collyer Lane	6/24/2017	46,651.00
Direct Install	26,944	32 S. Maple Ave	6/21/2017	73,988.00
Direct Install	27,063	277 South Maple Ave	6/21/2017	18,395.00
Direct Install		1 Collyer Lane	6/21/2017	9,488.00
Direct Install	3,332	262 S. Finley Ave	6/21/2017	3,441.00
C & I Retrofit	27,063	277 South Maple Ave	4/13/2017	12,779.00
C & I Retrofit	21,643	Bernards Town Hall 1 Collyer Lane	2/4/2014	10,039.52
C & I Retrofit		Township of Bernards 277 South Maple Ave.	1/9/2014	4,407.26
Direct Install	10,000	Bernards Police Dept. 1 Collyer Lane	9/13/2011	118,369.26
Direct Install	1,728	Bernards Community Service 31 Stonehouse Road	9/13/2011	8,269.19
Direct Install	26,944	Bernards Twp Library 32 S. Maple Ave	8/9/2011	87,292.05
Direct Install	5,600	Engineering Services Building 1 Collyer Lane	8/9/2011	79,979.66
Direct Install	21,643	Bernards Town Hall 1 Collyer Lane	8/9/2011	51,612.20
Direct Install	3,332	Bernards Board of Health 262 S. Finley Ave	8/9/2011	6,001.69
Local Government Energy Audit	26,944	Library 32 South Maple Avenue	8/15/2011	
Local Government Energy Audit	27,063	Engineering Services Bldg, Bernards Twp. 277 South	8/15/2011	
Local Government Energy Audit	21,643	Municipal Bldg, Bernards Twp. One Collyer Lane	8/15/2011	
Local Government Energy Audit	7,064	Police Dept. Bernards, Twp. One Collyer Ln	8/15/2011	
Local Government Energy Audit	2,925	Community Center Bernards Twp. 279 South Maple Ave	6/27/2011	
Local Government Energy Audit	512	Southard Park North Maple Ave	6/27/2011	
Local Government Energy Audit	7,520	Pleasant Valley Park Bernards Twp. 3405 Valley Rd	6/27/2011	
Local Government Energy Audit	19,986	Pleasant Valley Park Pool, Bernards Twp. 3405 Valley	6/27/2011	
Local Government Energy Audit	3,744	Dunham Park Somerville Rd & Liberty Corner Road	6/27/2011	
Local Government Energy Audit	2,048	Mountain Park Mountain Rd & Martinsville Rd	6/27/2011	
Local Government Energy Audit	3,332	Health Dept. Bernards twp. 262 South Finley Ave	6/27/2011	
Local Government Energy Audit	2,170	Parks Foreman's Bernards Twp. 31A Stonehouse Rd	6/27/2011	
Local Government Energy Audit	1,728	Community Service Bldg Bernards Twp. 31B Stonehouse	6/27/2011	



Direct Install	26,944	Bernards Twp Library 32 S. Maple Ave	8/9/2011	87,292.05
Direct Install	5,600	Engineering Services Building 1 Collyer Lane	8/9/2011	79,979.66



# Bernards Engagement with NJ Clean Energy Program

## Summary

2011:	273,503 kWhrs saved
2014:	14,447 kWhrs saved
2017:	351,524 kWhrs saved
<hr/>	
Total for all upgrades:	<b>603,474 kWhrs saved</b>

At 11 cents per kWhr, that equals approximately \$66,400 annual electric savings



# Success Story #3: South Brunswick Township

## NJCEP & Sustainable Jersey Timeline

- Smart Start upgrade to park building in 2010
- Local Government Energy Audit on public library and municipal building in 2013
- Direct Install upgrades to six buildings in 2015
- Local Fire District engaged with NJCEP in 2012 doing both an LGEA audit and upgrades to two fire stations
- Registered with SJ, but has not yet applied for certification. Given NJCEP history would qualify for at least 15 points in ***Energy Efficiency for Municipal Buildings*** action (possibly more with EUI calculation)



# South Brunswick Engagement with NJ Clean Energy Program

Program	Applicant	Premise Sq. Ft	Street Address Line 1	App Status Date	Ann. Elec Savings (KWh)
Local Government Energy Audit	South Brunswick Fire District	5,300	Vol. Fire Dept Station 21 481 Georges Road	5/8/2012	
Local Government Energy Audit	South Brunswick Fire District	15,200	Fire Dept. Station 20 573 Ridge Road	5/8/2012	
Direct Install	South Brunswick Fire District	16,000	Station 20 Fire House 573 Ridge Rd	2/28/2012	19,357.69
Direct Install	South Brunswick Fire District		Station 21 Fire House 481 Georges Road	1/31/2012	10,969.58
Direct Install	South Brunswick, Township of	40,000	S. Brunswick Municipal 750 Ridge Road	11/19/2015	105,356.97
Direct Install	South Brunswick, Township of		Publics Works Bldg 750 Ridge Rd.	11/19/2015	61,485.37
Direct Install	South Brunswick, Township of		Ridge Rd. Storage Ridge Rd.	11/19/2015	56,607.37
Direct Install	South Brunswick, Township of		S. Brunswick Senior Ctr 750 Ridge Rd.	11/19/2015	20,114.19
Direct Install	South Brunswick, Township of		S. Brunswick Recycling Ctr Monmouth Junction Rd	11/19/2015	2,423.04
Direct Install	South Brunswick, Township of		Reichler Park 540 Ridge Road	11/19/2015	1,606.86
Local Government Energy Audit	South Brunswick, Township of	84,460	Municipal Bldg 540 Ridge Road	9/12/2013	
Local Government Energy Audit	South Brunswick, Township of	40,000	South Brunswick Public Library 110 Kingston Lane	9/12/2013	
C & I Retrofit	South Brunswick, Township of		Reichler Park 540 Ridge Road	5/28/2010	12,678.82





# South Brunswick Engagement with NJ Clean Energy Program



Total Annual Savings from 2012 DI upgrades for Fire District: 30,327 kWhrs  
Total Annual Savings from 2015 DI upgrades for municipality: 247,594 kWhrs  
Total Annual Savings from Smart Start upgrades for municipality: 12,679 kWhrs  
**Total Annual Savings for all upgrades: 290,600 kWhrs**  
At 11 cents per kWhr, that equals approximately \$32,000 annual electric savings



# Gaining Additional Points for Energy Savings

By demonstrating a deeper implementation of energy efficiency measures, a municipality can score successively higher point levels in the **Energy Efficiency for Municipal Buildings** action. To achieve this, you can provide baseline data from an audit for your buildings portfolio (as here) or you can demonstrate savings based on actual energy usage data post upgrade (next slide).

Building	Building area in square feet	Baseline Energy Data from Energy Audit						total kbtu per month	Baseline EUI	Baseline Energy Data from Energy Audit					total kbtu per month after energy upgrades	EUI after Energy Upgrades	% Change EUI in Facility
		Enter your grid purchased electricity (kWh) in this column	Enter your natural gas (therms) in this column	Enter your oil (gallons) in this column	Enter your propane (gallons) into this column	Enter your on-site generated electricity (kWh) into this column	Enter potential electricity savings from ECMs (kWh) in this column			Enter potential natural gas savings from ECMs (therms) in this column	Enter potential oil savings from ECMs (gallons) in this column	Enter potential propane savings from ECMs (gallons) in this column	Enter potential on-site generated electricity from ECMs (kWh) in this column				
A. Russell Knight Elementary School	43,000	187,243	17,999				3,896,532	90.6	38,731	3,347				3,130,024	72.8	-19.7%	
Alternative High School	41,240	341,460	26,605				6,452,934	156.5	54,610	5,889				5,249,344	127.3	-18.7%	
Barclay School	32,300	153,760	22,855				4,047,628	125.3	17,953	3,347				3,503,794	108.5	-13.4%	
Bret Harte Elementary School	56,600	272,910	27,529				5,815,295	102.7	42,570	4,582				4,877,973	86.2	-16.1%	
Cherry Hill High-East High School	369,000	2,516,956	265,838				54,886,769	148.7	474,257	89,548				40,401,702	109.5	-26.4%	
Cherry Hill High-West High School	272,580	2,320,200	136,246				39,170,984	143.7	257,291	20,959				34,212,948	125.5	-12.7%	
Clara Barton Elementary School	50,100	262,560	22,763				5,203,975	103.9	-91,315	22,851				3,783,226	75.5	-27.3%	
Henry C. Beck Middle School	119,504	936,480	55,922				15,907,935	133.1	63,127	13,736				13,789,135	115.4	-13.3%	
Horace Mann Elementary School	41,000	221,490	11,956				3,629,048	88.5	63,951	1,547				2,781,262	67.8	-23.4%	
James F. Cooper Elementary School	49,850	204,660	22,436				4,549,061	91.3	19,243	5,864				3,727,118	74.8	-18.1%	
James Johnson Elementary School	51,550	244,284	23,034				5,036,565	97.7	29,938	3,367				4,362,190	84.6	-13.4%	
John A. Carusi Middle School	129,552	778,400	59,343				14,572,983	112.5	154,950	7,555				12,119,137	93.5	-16.8%	
Joseph D. Sharp Elementary School	44,434	284,895	20,054				5,158,786	116.1	38,688	2,737				4,456,789	100.3	-13.6%	
Joyce Kilmer Elementary School	55,942	263,610	44,860				7,535,400	134.7	25,416	5,731				6,661,266	119.1	-11.6%	
Kingston Elementary School	44,000	212,460	31,592				5,594,083	127.1	61,519	7,887				4,106,660	93.3	-26.6%	
Richard Stockton Elementary School	54,655	365,220	34,293				7,514,718	137.5	44,437	4,343				6,582,480	120.4	-12.4%	
Rosa International Middle School	88,737	514,600	49,531				10,715,636	120.8	60,426	6,228				9,414,121	106.1	-12.1%	
Thomas Paine Elementary School	51,866	229,545	25,013				5,086,398	98.1	50,514	6,543				3,858,034	74.4	-24.1%	
Woodcrest Elementary School	53,185	374,160	21,701				6,288,382	118.2	69,696	1,852				5,347,003	100.5	-15.0%	



# Gaining Additional Points for Energy Savings

Project:	Readington Middle School, Readington, NJ										
School area in square feet	121,536										
Source EUI kbtu/sf/yr	<b>154.4</b>										
2012-13	Enter your grid purchased electricity (kWh) in this column	kwh converted to kbtu	Enter your natural gas (therms) in this column	therms converted to kbtu	Enter your oil (gallons) in this column	gallons converted to kbtu	Enter your propane (gallons) into this column	gallons converted to kbtu	Enter your on-site generated electricity (kWh) into this column	kWh converted to kbtu	total kbtu per month
July	92,311	989,280	181	18,974		0		0		0	1,008,254
August	61,410	658,120	176	18,438		0		0		0	676,558
September	109,093	1,169,130	337	35,406		0		0		0	1,204,536
October	83,433	894,136	1,652	173,408		0		0		0	1,067,544
November	99,663	1,068,070	3,599	377,937		0		0		0	1,446,007
December	126,528	1,355,978	9,704	1,018,920		0		0		0	2,374,898
January	142,544	1,527,618	10,364	1,088,220		0		0		0	2,615,838
February	123,238	1,320,719	10,238	1,074,990		0		0		0	2,395,709
March	118,747	1,272,590	8,942	938,910		0		0		0	2,211,500
April	109,901	1,177,789	4,628	485,940		0		0		0	1,663,729
May	89,132	955,212	1,442	151,410		0		0		0	1,106,622
June	86,706	929,213	647	67,935		0		0		0	997,148
Annual totals	1,242,706		51,909		0		0		0		18,768,344
	kwh		therms		gallons		gallons		kwh		kbtu



# Municipalities Potentially Affected by New Action

<u>Municipality</u>	<u>County</u>	<u>Municipality</u>	<u>County</u>	<u>Municipality</u>	<u>County</u>
Atlantic City	Atlantic	Newark City	Essex	Chatham Boro	Morris
Hamilton Twp	Atlantic	Glassboro Boro	Gloucester	Chatham Twp	Morris
Pleasantville City	Atlantic	High Bridge Boro	Hunterdon	Long Beach Twp	Ocean
Somers Point City	Atlantic	Lambertville City	Hunterdon	Bridgewater Twp	Somerset
Glen Rock Boro	Bergen	East Windsor Twp	Mercer	Montgomery Twp	Somerset
Mahwah Twp	Bergen	Trenton City	Mercer	Hopatcong Boro	Sussex
Old Tappan Boro	Bergen	Perth Amboy City	Middlesex	Elizabeth City	Union
Park Ridge Boro	Bergen	Holmdel Twp	Monmouth	Fanwood Boro	Union
Woodbine Boro	Cape May	Howell Twp	Monmouth	Springfield Twp	Union
Maurice River Twp	Cumberland	Boonton Twp	Morris	Mansfield Twp	Warren
Millburn Twp	Essex				



# Sustainable Jersey Webinars

## **Success Stories in Commercial Energy Efficiency Outreach**

Wednesday, April 4, 2018, 1:00pm – 2:00pm

[REGISTER](#)

## **Success Stories in Residential Energy Efficiency Outreach**

Wednesday, May 2, 2018, 1:00pm – 2:00pm

[REGISTER](#)



# FREE Technical Assistance

## Roots for Rivers Reforestation Grant & TA Program

The program will support municipal/school district efforts to undertake their own floodplain reforestation initiative on public or private land.

**Application Deadline: Friday, March 16 at 11:59pm**

## Energy Initiative Technical Assistance

This opportunity is in partnership with the Environmental Defense fund and New Jersey Natural Gas. The focus of this initiative is on implementing projects that will improve building performance through energy efficiency analysis and planning & upgrades, but may also focus on renewable energy and other energy-related improvements. Check out our [video](#) on the 2017 EDF program!

**Application Deadline: Friday, April 13 at 11:59pm**



# Sustainability Summit

**Thursday, June 21, 9:00am – 3:00pm**

**The College of New Jersey**

Every year Sustainable Jersey brings a unique mix of public, private, state and local partners together to support communities in achieving remarkable progress. Last year, over 300 people attended the 2017 New Jersey Sustainability Summit to find ways that we can all work together to build local capacity for change and have a collective impact. Stay tuned for more information and registration link coming soon!



# Municipal Sponsors

## Program Underwriters



## Grants Program Underwriters



## Corporate Sponsors

### Platinum



### Gold



### Silver



### Bronze





# Thank you!

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