



Local Government Energy Audit: Energy Audit Report



Copyright ©2018 TRC Energy Services. All rights reserved.

Reproduction or distribution of the whole, or any part of the contents of this document without written permission of TRC is prohibited. Neither TRC nor any of its employees makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any data, information, method, product or process disclosed in this document, or represents that its use will not infringe upon any privately-owned rights, including but not limited to, patents, trademarks or copyrights.

***William Roper Early Education
Learning Center***

**Woodstown-Pilesgrove Regional School
District**

**211 East Lake Road
Pilesgrove, New Jersey 08098**

October 24, 2018

Final Report by:

TRC Energy Services

Disclaimer

The intent of this energy analysis report is to identify energy savings opportunities and recommend upgrades to the facility's energy using equipment and systems. Approximate savings are included in this report to help make decisions about reducing energy use at the facility. This report, however, is not intended to serve as a detailed engineering design document. Further design and analysis may be necessary in order to implement some of the measures recommended in this report.

The energy conservation measures and estimates of energy savings have been reviewed for technical accuracy. However, estimates of final energy savings are not guaranteed, because final savings may depend on behavioral factors and other uncontrollable variables. TRC Energy Services (TRC) and New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

Estimated installation costs are based on TRC's experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. The owner of the facility is encouraged to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Since actual installed costs can vary widely for certain measures and conditions, TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. The owner of the facility should review available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

Table of Contents

1	Executive Summary	1
1.1	Facility Summary	1
1.2	Your Cost Reduction Opportunities.....	1
	Energy Conservation Measures.....	1
	Energy Efficient Practices	3
	On-Site Generation Measures.....	3
1.3	Implementation Planning.....	4
2	Facility Information and Existing Conditions	5
2.1	Project Contacts	5
2.2	General Site Information	5
2.3	Building Occupancy	5
2.4	Building Envelope	5
2.5	On-Site Generation.....	6
2.6	Energy-Using Systems	6
	Lighting System	6
	Packaged Terminal Air Conditioning Units with Electrical Resistance Heat.....	7
	Domestic Hot Water Heating (DHW) System.....	7
	Building Plug Load	7
3	Site Energy Use and Costs	8
3.1	Total Cost of Energy	8
3.2	Electricity Usage	9
3.3	Benchmarking.....	10
3.4	Energy End-Use Breakdown	11
4	Energy Conservation Measures	12
4.1	Recommended ECMs	12
4.1.1	Lighting Upgrades.....	13
	ECM 1: Install LED Fixtures	13
	ECM 2: Retrofit Fixtures with LED Lamps.....	14
4.1.2	Plug Load Equipment Control - Vending Machines.....	15
	ECM 3: Vending Machine Control	15
5	Energy Efficient Practices	16
	Perform Proper Lighting Maintenance.....	16
	Ensure Lighting Controls Are Operating Properly	16
	Clean Evaporator/Condenser Coils on AC Systems	16
	Clean and/or Replace HVAC Filters	16
	Perform Proper Water Heater Maintenance	17
	Water Conservation	17
6	On-Site Generation Measures	18
6.1	Photovoltaic.....	18

6.2	Combined Heat and Power	20
7	Demand Response	21
8	Project Funding / Incentives	22
8.1	SmartStart	23
8.2	Direct Install	24
8.3	Energy Savings Improvement Program	25
9	Energy Purchasing and Procurement Strategies	26
9.1	Retail Electric Supply Options.....	26
9.2	Retail Natural Gas Supply Options	26

Appendix A: Equipment Inventory & Recommendations

Appendix B: ENERGY STAR® Statement of Energy Performance

Table of Figures

Figure 1 – Previous 12 Month Utility Costs.....	2
Figure 2 – Potential Post-Implementation Costs	2
Figure 3 – Summary of Energy Reduction Opportunities	2
Figure 4 – Photovoltaic Potential.....	3
Figure 5 – Project Contacts	5
Figure 6 - Building Schedule.....	5
Figure 7 – Building Façade	5
Figure 8 - Building Lighting Systems	6
Figure 9 – Building Cooling and Heating System	7
Figure 10 - Domestic Hot Water Heater	7
Figure 11 - Utility Summary	8
Figure 12 - Energy Cost Breakdown.....	8
Figure 13 - Electric Usage & Demand.....	9
Figure 14 – Electric Usage & Demand.....	9
Figure 15 - Energy Use Intensity Comparison – Existing Conditions.....	10
Figure 16 - Energy Use Intensity Comparison – Following Installation of Recommended Measures	10
Figure 17 - Energy Balance (% and kBtu/SF)	11
Figure 18 – Summary of Recommended ECMs.....	12
Figure 19 – Summary of Lighting Upgrade ECMs.....	13
Figure 20-Summary of Plug Load Equipment Control ECMs	15
Figure 21 - Photovoltaic Screening	18
Figure 22 - Combined Heat and Power Screening	20
Figure 23 - ECM Incentive Program Eligibility.....	22

I EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPUB) has sponsored this Local Government Energy Audit (LGEA) Report for the William Roper Early Education Learning Center.

The goal of an LGEA report is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and provide information and assistance to help facilities implement ECMs. The LGEA report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

This study was conducted by TRC Energy Services (TRC), as part of a comprehensive effort to assist New Jersey schools in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

I.1 Facility Summary

The William Roper Early Education Center is a 16,856 square foot facility constructed in 2013. The facility is a single-story, all-electrical commercial building comprised of spaces typically found within educational facilities. Such spaces include classrooms, multipurpose room, corridors, storage rooms, restrooms, and a small kitchen.

Interior lighting at the facility mainly consists of T8, 3-lamp linear fluorescent fixtures controlled by occupancy sensors. Exterior lighting is comprised of metal halide (MH) wall-mounted and pole-mounted fixtures, and few compact fluorescent (CFL) fixtures all controlled by photocells.

Heating and cooling is provided by 16 3.5-ton packaged terminal air-conditioning units equipped with 15 kW electrical resistance heaters; two wall-mounted electrical resistance heaters provide heating to the electrical and storage rooms.

A thorough description of the facility and our observations can be found in Section 2.

I.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated three measures which together represent an opportunity for William Roper Early Education Learning Center to reduce annual energy costs by roughly \$8,868 and annual greenhouse gas emissions by 38,508 lbs CO₂e. We estimate that if all measures were implemented as recommended, the project would pay for itself in roughly 4.9 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce William Roper Early Education Learning Center's annual energy use by 25%.

Figure 1 – Previous 12 Month Utility Costs

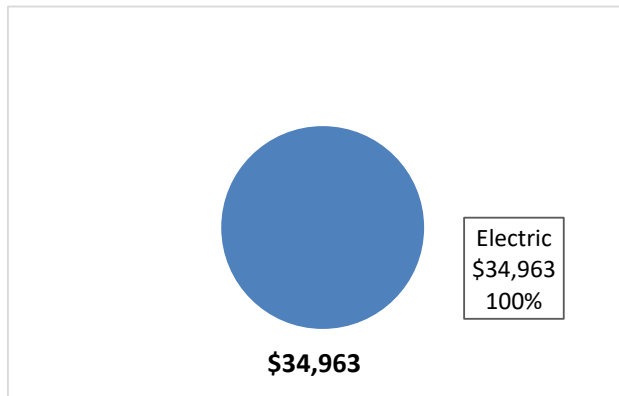
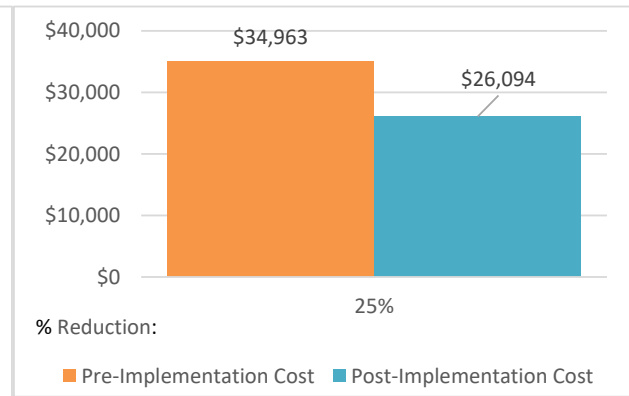


Figure 2 – Potential Post-Implementation Costs



A detailed description of William Roper Early Education Learning Center’s existing energy use can be found in Section 3.

Estimates of the total cost, energy savings, and financial incentives for the proposed energy efficient upgrades are summarized below in Figure 3. A brief description of each category can be found below and a description of savings opportunities can be found in Section 4.

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure	Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		36,629	8.9	0.0	\$8,494.62	\$48,393.47	\$5,505.00	\$42,888.47	5.0	36,885
ECM 1	Install LED Fixtures	26,806	3.7	0.0	\$6,216.57	\$34,373.70	\$2,800.00	\$31,573.70	5.1	26,993
ECM 2	Retrofit Fixtures with LED Lamps	9,823	5.1	0.0	\$2,278.06	\$14,019.78	\$2,705.00	\$11,314.78	5.0	9,892
Plug Load Equipment Control - Vending Machine		1,612	0.0	0.0	\$373.80	\$230.00	\$0.00	\$230.00	0.6	1,623
ECM 3	Vending Machine Control	1,612	0.0	0.0	\$373.80	\$230.00	\$0.00	\$230.00	0.6	1,623
TOTALS		38,241	8.9	0.0	\$8,868.43	\$48,623.47	\$5,505.00	\$43,118.47	4.9	38,508

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Lighting Upgrades generally involve the replacement of existing lighting components such as lamps and ballasts (or the entire fixture) with higher efficiency lighting components. These measure save energy by reducing the power used by the lighting components due to improved electrical efficiency.

Plug Load Equipment control measures generally involve installing automated devices that limit the power usage or operation of equipment that is plugged into electric outlets when not in use.

Energy Efficient Practices

TRC also identified six low cost (or no cost) energy efficient practices. A facility’s energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at William Roper Early Education Learning Center include:

- Perform Proper Lighting Maintenance
- Ensure Lighting Controls Are Operating Properly
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Perform Proper Water Heater Maintenance
- Water Conservation

For details on these energy efficient practices, please refer to Section 5.

On-Site Generation Measures

TRC evaluated the potential for installing on-site generation for William Roper Early Education Learning Center. Based on the configuration of the site and its loads there is a moderate potential for installing a photovoltaic (PV) array.

Figure 4 – Photovoltaic Potential

Potential	Medium	
System Potential	94	kW DC STC
Electric Generation	111,989	kWh/yr
Displaced Cost	\$9,740	/yr
Installed Cost	\$366,600	

For details on our evaluation and on-site generation potential, please refer to Section 6.

1.3 Implementation Planning

To realize the energy savings from the ECMs listed in this report, a project implementation plan must be developed. Available capital must be considered and decisions need to be made whether it is best to pursue individual ECMs separately, groups of ECMs, or a comprehensive approach where all ECMs are implemented together, possibly in conjunction with other facility upgrades or improvements.

Rebates, incentives, and financing are available from NJCEP, as well as other sources, to help reduce the costs associated with the implementation of energy efficiency projects. Prior to implementing any measure, please review the relevant incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives prior to purchasing materials or commencing with installation.

The ECMs outlined in this report may qualify under the following program(s):

- SmartStart
- Direct Install
- Energy Savings Improvement Program (ESIP)

For facilities wanting to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate in this program you may utilize internal resources, or an outside firm or contractor, to do the final design of the ECM(s) and do the installation. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation. The incentive estimates listed above in Figure 3 are based on the SmartStart program. More details on this program and others are available in Section 8.

This facility may also qualify for the Direct Install program which can provide turnkey installation of multiple measures, through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures, although measure eligibility will have to be assessed and be verified by the designated Direct Install contractor and, in most cases, they will perform the installation work.

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.3 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce electric loads at commercial facilities, when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability. By enabling grid operators to call upon commercial facilities to reduce their electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and facilities receive payments whether or not they are called upon to curtail their load during times of peak demand. Refer to Section 7 for additional information on this program.

Additional information on relevant incentive programs is located in Section 8 or: www.njcleanenergy.com/ci.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Rose Wang Chin	Business Admin/Board Secretary	chin.r@woodstown.org	(856) 769-0144 Ext. 22251
Designated Representative			
Bryan McGair	Account Executive	bryan.mcgair@schneider-electric.com	(609) 654-4831
TRC Energy Services			
Moussa Traore	Auditor	mtraore@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On April 12, 2018, TRC performed an energy audit at William Roper Early Education Learning Center located in Pilesgrove, New Jersey. TRC’s auditor met with Ryan Danner to review the facility operations and help focus our investigation on specific energy-using systems.

2.3 Building Occupancy

The William Roper Early Education Learning Center’s typical schedule is presented in the table below. The entire facility is used approximately 41 weeks per year. During a typical day, the facility is occupied by approximately 194 students and staff.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
William Roper Early Education Learning Center	Weekday	8:00 AM - 4:00 PM
William Roper Early Education Learning Center	Weekend	Closed

2.4 Building Envelope

William Roper Early Education Learning Center is a single-story building with vinyl siding exterior. The building has clear double-pane windows, metal doors, and a sloped roof constructed of built-up material, all in good condition.

Figure 7 – Building Façade



2.5 On-Site Generation

William Roper Early Education Learning does not have any on-site electric generation capacity.

2.6 Energy-Using Systems

Please see Appendix A: Equipment Inventory & Recommendations for an inventory of the facility's equipment.

Lighting System

Interior lighting mainly consists of three-lamp T8 linear fluorescent fixtures. All interior fixtures, with the exception of the LED exit signs, are controlled by occupancy sensors.

Exterior lighting is comprised of metal halide (MH) and compact fluorescent light (CFL) fixtures, all controlled by photocells. Four recessed CFL fixtures with pin-base lamps are found in the main entrance canopy, and 13 150-Watt MH fixtures are mounted on the exterior walls. The facility's parking lot is lit by 15 400-Watt MH pole mounted fixtures.

The existing lighting sources are all inefficient in performance when compared to the latest lighting technology available in the market.

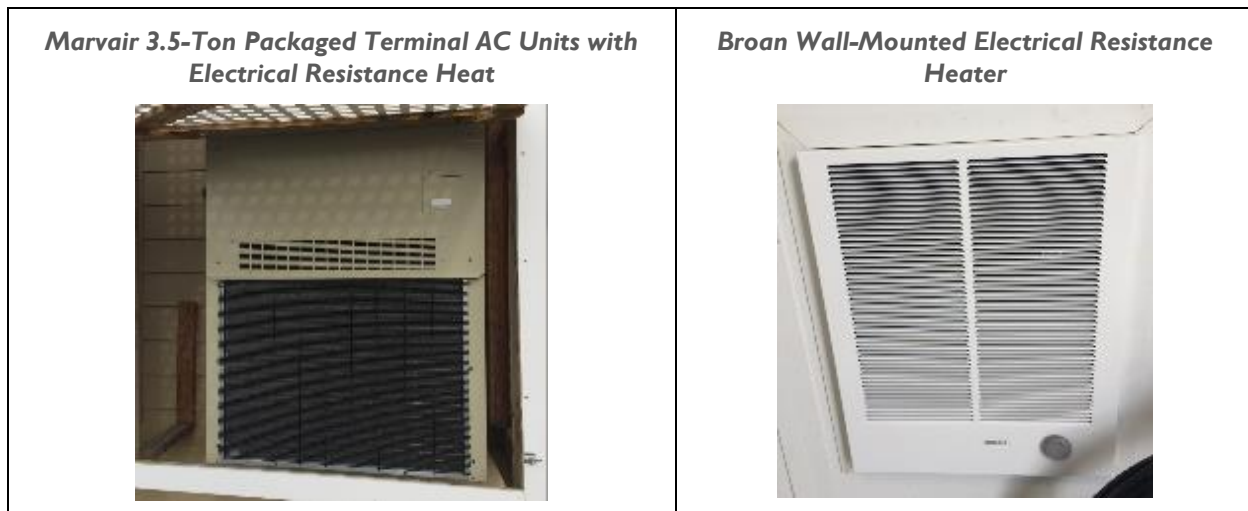
Figure 8 - Building Lighting Systems



Packaged Terminal Air Conditioning Units with Electrical Resistance Heat

The facility is conditioned by 16 3.5-ton Marvair packaged terminal air conditioners equipped with 15-kW electrical resistance heaters. Two Broan wall-mounted electrical resistance heaters provide heating to the electrical and storage rooms. The units are in good condition.

Figure 9 – Building Cooling and Heating System



Domestic Hot Water Heating (DHW) System

The domestic hot water heating system is comprised of a single 3 kW electric water heater with an 80-gallon storage tank. The heater is five years old and is in good condition.

Figure 10 - Domestic Hot Water Heater



Building Plug Load

The facility has 12 computer workstations and two printer-copier machines. Additional plug loads include three small freezers, 11 televisions, a water cooler, and three microwave ovens.

3 SITE ENERGY USE AND COSTS

Utility data for electricity was analyzed to identify opportunities for savings. In addition, data for electricity was evaluated to determine the annual energy performance metrics for the building in energy cost per square foot and energy usage per square foot. These metrics are an estimate of the relative energy efficiency of this building. There are a number of factors that could cause the energy use of this building to vary from the “typical” energy usage profile for facilities with similar characteristics. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and energy efficient behavior of occupants all contribute to benchmarking scores. Please refer to the Benchmarking section within Section 3.3 for additional information.

3.1 Total Cost of Energy

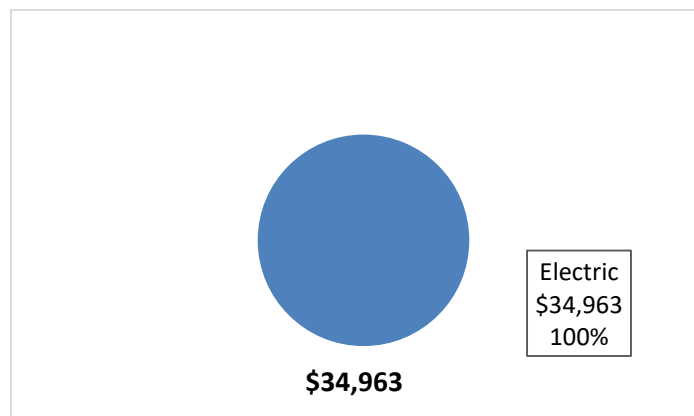
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 11 - Utility Summary

Utility Summary for William Roper Early Education Learning Center		
Fuel	Usage	Cost
Electricity	150,759 kWh	\$34,963
Total		\$34,963

The current annual energy cost for this facility is \$34,963 as shown in the chart below.

Figure 12 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by Atlantic City Electric. The average electric cost over the past 12 months was \$0.232/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly electricity consumption and peak demand are shown in the chart below.

It should be noted that the energy use intensity (EUI) estimated for this facility of 8.9 kWh/sq.ft. is notably lower than the average EUI for educational-type facilities in the Atlantic region of 9.6 kWh/sq.ft. In addition, since the facility is all electric, it would be expected for its EUI to be higher than average, but this is not the case. Based on TRC’s experience this may be attributed to the site being very efficient in the operation of their electricity systems, or it may be related to an incorrect electric meter multiplier or an issue with the meter itself, which is an extremely rare occurrence.

Due to the lower-than-expected energy consumption, low operating hours have been assumed to balance the energy assessment to the historical electric data. Hence, this audit provides conservative estimates as they relate to the implementation of the energy efficiency measures evaluated.

The graph below indicated an electrical heating profile as evidenced by the peak winter usage.

Figure 13 - Electric Usage & Demand

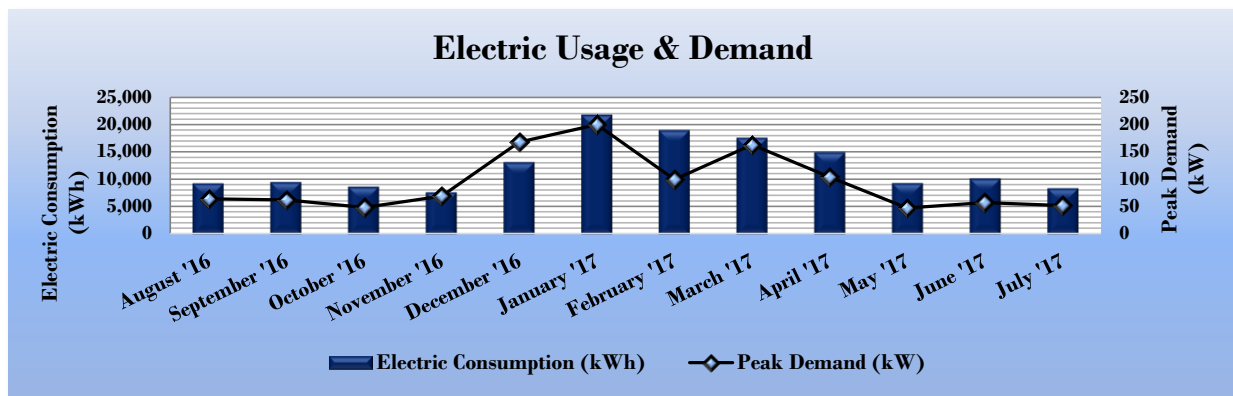


Figure 14 – Electric Usage & Demand

Electric Billing Data for William Roper Early Education Learning Center				
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Total Electric Cost
8/16/16	29	9,280	64	\$2,311
9/15/16	30	9,520	62	\$2,448
10/17/16	32	8,720	48	\$2,433
11/12/16	26	7,680	69	\$2,044
12/13/16	31	13,120	168	\$3,529
1/17/17	35	21,760	200	\$5,174
2/14/17	28	18,960	99	\$3,410
3/15/17	29	17,600	163	\$3,851
4/17/17	33	14,960	104	\$3,182
5/16/17	29	9,360	47	\$2,367
6/15/17	30	10,160	57	\$2,398
7/15/17	30	8,400	51	\$1,529
Totals	362	149,520	200	\$34,675
Annual	365	150,759	200	\$34,963

3.3 Benchmarking

This facility was benchmarked using Portfolio Manager®, an online tool created and managed by the United States Environmental Protection Agency (EPA) through the ENERGY STAR® program. Portfolio Manager® analyzes your building’s consumption data, cost information, and operational use details and then compares its performance against a national median for similar buildings of its type. Metrics provided by this analysis are Energy Use Intensity (EUI) and an ENERGY STAR® score for select building types.

The EUI is a measure of a facility’s energy consumption per square foot, and it is the standard metric for comparing buildings’ energy performance. Comparing the EUI of a building with the national median EUI for that building type illustrates whether that building uses more or less energy than similar buildings of its type on a square foot basis. EUI is presented in terms of “site energy” and “source energy.” Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

Figure 15 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	William Roper Early Education Learning Center	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft ²)	95.8	141.4
Site Energy Use Intensity (kBtu/ft ²)	30.5	58.2

Implementation of all recommended measures in this report would improve the building’s estimated EUI significantly, as shown in the table below:

Figure 16 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	William Roper Early Education Learning Center	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft ²)	71.5	141.4
Site Energy Use Intensity (kBtu/ft ²)	22.8	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building’s energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 90.

A Portfolio Manager® Statement of Energy Performance (SEP) was generated for this facility, see Appendix B: ENERGY STAR® Statement of Energy Performance.

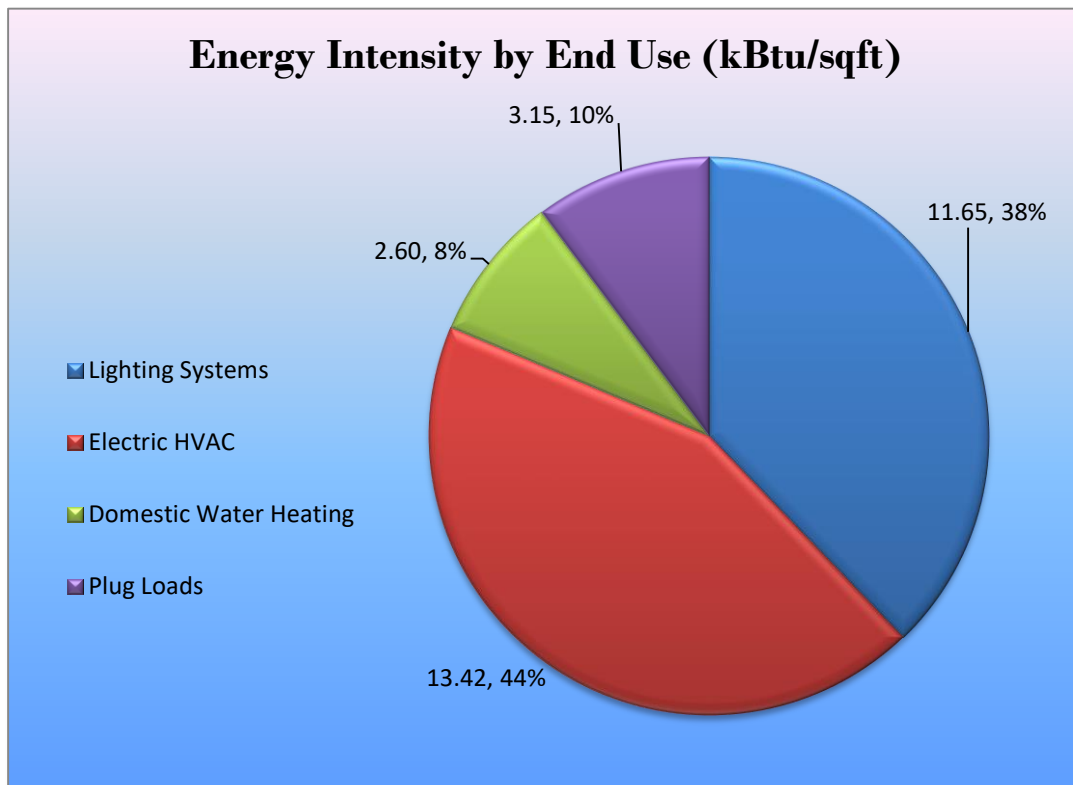
For more information on ENERGY STAR® certification go to: <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1>.

A Portfolio Manager® account has been created online for your facility and you will be provided with the login information for the account. We encourage you to update your utility information in Portfolio Manager® regularly, so that you can keep track of your building’s performance. Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building’s performance at: <https://www.energystar.gov/buildings/training>.

3.4 Energy End-Use Breakdown

In order to provide a complete overview of energy consumption across building systems, an energy balance was performed at this facility. An energy balance utilizes standard practice engineering methods to evaluate all components of the various electric and fuel-fired systems found in a building to determine their proportional contribution to overall building energy usage. This chart of energy end uses highlights the relative contribution of each equipment category to total energy usage. This can help determine where the greatest benefits might be found from energy efficiency measures.

Figure 17 - Energy Balance (% and kBtu/SF)



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the William Roper Early Education Learning Center regarding financial incentives for which they may qualify to implement the recommended measures. For this audit report, most measures have received only a preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to demonstrate project cost-effectiveness and help prioritize energy measures. Savings are based on the New Jersey Clean Energy Program Protocols to Measure Resource Savings dated June 29, 2016, approved by the New Jersey Board of Public Utilities. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances. A higher level of investigation may be necessary to support any custom SmartStart or Pay for Performance, or Direct Install incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJCEP prescriptive SmartStart program. Some measures and proposed upgrade projects may be eligible for higher incentives than those shown below through other NJCEP programs as described in Section 8.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

The measures below have been evaluated by the auditor and are recommended for implementation at the facility.

Figure 18 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		36,629	8.9	0.0	\$8,494.62	\$48,393.47	\$5,505.00	\$42,888.47	5.0	36,885
ECM 1	Install LED Fixtures	26,806	3.7	0.0	\$6,216.57	\$34,373.70	\$2,800.00	\$31,573.70	5.1	26,993
ECM 2	Retrofit Fixtures with LED Lamps	9,823	5.1	0.0	\$2,278.06	\$14,019.78	\$2,705.00	\$11,314.78	5.0	9,892
Plug Load Equipment Control - Vending Machine		1,612	0.0	0.0	\$373.80	\$230.00	\$0.00	\$230.00	0.6	1,623
ECM 3	Vending Machine Control	1,612	0.0	0.0	\$373.80	\$230.00	\$0.00	\$230.00	0.6	1,623
TOTALS		38,241	8.9	0.0	\$8,868.43	\$48,623.47	\$5,505.00	\$43,118.47	4.9	38,508

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

4.1.1 Lighting Upgrades

Our recommendations for upgrades to existing lighting fixtures are summarized in Figure 19 below.

Figure 19 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		36,629	8.9	0.0	\$8,494.62	\$48,393.47	\$5,505.00	\$42,888.47	5.0	36,885
ECM 1	Install LED Fixtures	26,806	3.7	0.0	\$6,216.57	\$34,373.70	\$2,800.00	\$31,573.70	5.1	26,993
ECM 2	Retrofit Fixtures with LED Lamps	9,823	5.1	0.0	\$2,278.06	\$14,019.78	\$2,705.00	\$11,314.78	5.0	9,892

During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled.

ECM I: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Interior	0	0.0	0.0	\$0.00	\$0.00	\$0.00	\$0.00	0.0	0
Exterior	26,806	3.7	0.0	\$6,216.57	\$34,373.70	\$2,800.00	\$31,573.70	5.1	26,993

Measure Description

We recommend replacing existing metal halide (MH) wall-pack and pole-mounted lighting fixtures with new high-performance LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which may be twice as long as MH lamps.

ECM 2: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Interior	9,567	5.1	0.0	\$2,218.72	\$13,589.75	\$2,705.00	\$10,884.75	4.9	9,634
Exterior	256	0.0	0.0	\$59.33	\$430.02	\$0.00	\$430.02	7.2	258

Measure Description

We recommend retrofitting existing incandescent, compact fluorescent and linear fluorescent lamps with LED lamps. Many LED tube lamps are direct replacements for existing incandescent and fluorescent lamps. LED lamps can be installed while leaving the fluorescent fixture ballast in place and can be used in existing fixtures as a direct replacement for most other lighting technologies. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of fluorescent tubes and more than 10 times longer than many incandescent lamps.

4.1.2 Plug Load Equipment Control - Vending Machines

Our recommendations for plug load equipment control measures are summarized in Figure 20 below.

Figure 20-Summary of Plug Load Equipment Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Plug Load Equipment Control - Vending Machine		1,612	0.0	0.0	\$373.80	\$230.00	\$0.00	\$230.00	0.6	1,623
ECM 3	Vending Machine Control	1,612	0.0	0.0	\$373.80	\$230.00	\$0.00	\$230.00	0.6	1,623

ECM 3: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
1,612	0.0	0.0	\$373.80	\$230.00	\$0.00	\$230.00	0.6	1,623

Measure Description

Vending machines operate continuously, even during non-business hours. It is recommended to install occupancy sensor controls on refrigerated vending machines to reduce the energy use. These controls power down vending machines when the vending machine area has been vacant for some time, then power up at regular intervals, as needed, to turn machine lights on or keep the product cool. Energy savings are dependent on vending machine and activity level in the area surrounding the machines.

5 ENERGY EFFICIENT PRACTICES

In addition to the quantifiable savings estimated in Section 4, a facility's energy performance can also be improved through application of many low cost or no-cost energy efficiency strategies. By employing certain behavioral and operational changes and performing routine maintenance on building systems, equipment lifetime can be extended; occupant comfort, health and safety can be improved; and energy and O&M costs can be reduced. The recommendations below are provided as a framework for developing a whole building maintenance plan that is customized to your facility. Consult with qualified equipment specialists for details on proper maintenance and system operation.

Perform Proper Lighting Maintenance

In order to sustain optimal lighting levels, lighting fixtures should undergo routine maintenance. Light levels decrease over time due to lamp aging, lamp and ballast failure, and buildup of dirt and dust on lamps, fixtures and reflective surfaces. Together, these factors can reduce total illumination by 20% - 60% or more, while operating fixtures continue drawing full power. To limit this reduction, lamps, reflectors and diffusers should be thoroughly cleaned of dirt, dust, oil, and smoke film buildup approximately every 6 – 12 months.

Ensure Lighting Controls Are Operating Properly

Lighting controls are very cost-effective energy efficient devices, when installed and operating correctly. As part of a lighting maintenance schedule, lighting controls should be tested annually to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight sensors, maintenance involves cleaning of sensor lenses and confirming setpoints and sensitivity are appropriately configured.

Clean Evaporator/Condenser Coils on AC Systems

Dirty evaporators and condensers coils cause a restriction to air flow and restrict heat transfer. This results in increased evaporator and condenser fan load and a decrease in cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

Clean and/or Replace HVAC Filters

Air filters work to reduce the amount of indoor air pollution and increase occupant comfort. Over time, filters become less and less effective as particulate buildup increases. In addition to health concerns related to clogged filters, filters that have reached saturation also restrict air flow through the facility's air conditioning or heat pump system, increasing the load on the distribution fans and decreasing occupant comfort levels. Filters should be checked monthly and cleaned or replaced when appropriate.

Perform Proper Water Heater Maintenance

At least once a year, drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Once a year check for any leaks or heavy corrosion on the pipes and valves. For gas water heaters, check the draft hood and make sure it is placed properly, with a few inches of air space between the tank and where it connects to the vent. Look for any corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional. For electric water heaters, look for any signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank. For water heaters over three to four years old have a technician inspect the sacrificial anode annually.

Water Conservation

Installing low-flow faucets or faucet aerators, low-flow showerheads, and kitchen sink pre-rinse spray valves saves both energy and water. These devices save energy by reducing the overall amount of hot water used hence reducing the energy used to heat the water. The flow ratings for EPA WaterSense™ (<http://www3.epa.gov/watersense/products>) labeled devices are 1.5 gallons per minute (gpm) for bathroom faucets, 2.0 gpm for showerheads, and 1.28 gpm for pre-rinse spray valves.

Installing dual flush or low-flow toilets and low-flow or waterless urinals are additional ways to reduce the sites water use, however, these devices do not provide energy savings at the site level. Any reduction in water use does however ultimately reduce grid level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users. The EPA WaterSense™ ratings for urinals is 0.5 gallons per flush (gpf) and toilets that use as little as 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

6 ON-SITE GENERATION MEASURES

On-site generation measure options include both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) on-site technologies that generate power to meet all or a portion of the electric energy needs of a facility, often repurposing any waste heat where applicable. Also referred to as distributed generation, these systems contribute to Greenhouse Gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, resulting in the electric system reliability through improved transmission and distribution system utilization.

The State of New Jersey’s Energy Master Plan (EMP) encourages new distributed generation of all forms and specifically focuses on expanding use of combined heat and power (CHP) by reducing financial, regulatory and technical barriers and identifying opportunities for new entries. The EMP also outlines a goal of 70% of the State’s electrical needs to be met by renewable sources by 2050.

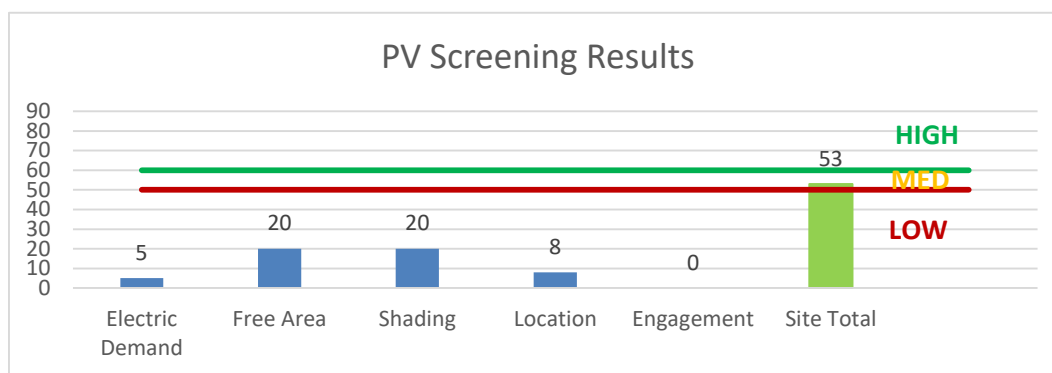
Preliminary screenings were performed to determine the potential that a generation project could provide a cost-effective solution for your facility. Before making a decision to implement, a feasibility study should be conducted that would take a detailed look at existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

6.1 Photovoltaic

Sunlight can be converted into electricity using photovoltaics (PV) modules. Modules are racked together into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is interconnected to the facility’s electrical distribution system. The amount of unobstructed area available determines how large of a solar array can be installed. The size of the array combined with the orientation, tilt, and shading elements determines the energy produced.

A preliminary screening based on the facility’s electric demand, size and location of free area, and shading elements shows that the facility has a **Medium** potential for installing a PV array. The amount of free area, ease of installation (location), and the lack of shading elements contribute to the potential for PV at the site. A PV array located on the roof of the main building and/or over the main parking lot may be feasible. If William Roper Early Education Learning Center is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 21 - Photovoltaic Screening



Solar projects must register their projects in the SREC (Solar Renewable Energy Certificate) Registration Program (SRP) prior to the start of construction in order to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about developed new solar projects and insight into future SREC pricing.

For more information on solar PV technology and commercial solar markets in New Jersey, or to find a qualified solar installer, who can provide a more detailed assessment of the specific costs and benefits of solar develop of the site, please visit the following links below:

- **Basic Info on Solar PV in NJ:** <http://www.njcleanenergy.com/whysolar>
- **NJ Solar Market FAQs:** <http://www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs>
- **Approved Solar Installers in the NJ Market:** http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1

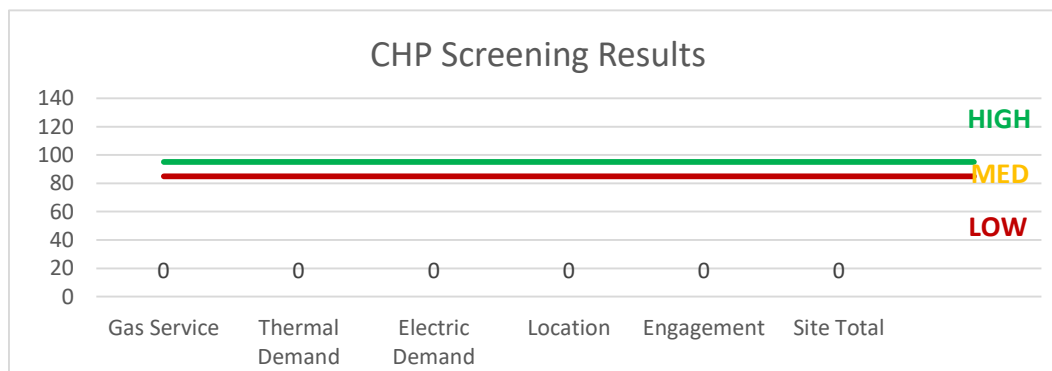
6.2 Combined Heat and Power

Combined heat and power (CHP) is the on-site generation of electricity along with the recovery of heat energy, which is put to beneficial use. Common technologies for CHP include reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines. Electric generation from a CHP system is typically interconnected to local power distribution systems. Heat is recovered from exhaust and ancillary cooling systems and interconnected to the existing hot water (or steam) distribution systems.

CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for the purpose of space cooling. The key criteria used for screening, however, is the amount of time the system operates at full load and the facility's ability to use the recovered heat. Facilities with continuous use for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has a **Low** potential for installing a cost-effective CHP system. Lack of gas service is the most significant factor contributing to the low potential for CHP at the site. In our opinion, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation.

Figure 22 - Combined Heat and Power Screening



7 DEMAND RESPONSE

Demand Response (DR) is a program designed to reduce the electric load of commercial facilities when electric wholesale prices are high or when the reliability of the electric grid is threatened due to peak demand. Demand Response service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability.

By enabling grid operators to call upon Curtailment Service Providers and commercial facilities to reduce electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and participants receive payments whether or not their facility is called upon to curtail their electric usage.

Typically an electric customer needs to be capable of reducing their electric demand, within minutes, by at least 100 kW or more in order to participate in a DR program. Customers with a greater capability to quickly curtail their demand during peak hours will receive higher payments. Customers with back-up generators onsite may also receive additional DR payments for their generating capacity if they agree to run the generators for grid support when called upon. Eligible customers who have chosen to participate in a DR programs often find it to be a valuable source of revenue for their facility because the payments can significantly offset annual electric costs.

Participating customers can often quickly reduce their peak load through simple measures, such as temporarily raising temperature set points on thermostats, so that air conditioning units run less frequently, or agreeing to dim or shut off less critical lighting. This usually requires some level of building automation and controls capability to ensure rapid load reduction during a DR curtailment event. DR program participants may need to install smart meters or may need to also sub-meter larger energy-using equipment, such as chillers, in order to demonstrate compliance with DR program requirements.

DR does not include the reduction of electricity consumption based on normal operating practice or behavior. For example, if a company's normal schedule is to close for a holiday, the reduction of electricity due to this closure or scaled-back operation is not considered a demand response activity in most situations.

The first step toward participation in a DR program is to contact a Curtailment Service Provider. A list of these providers is available on PJM's website and it includes contact information for each company, as well as the states where they have active business (<http://www.pjm.com/markets-and-operations/demand-response/csps.aspx>). PJM also posts training materials that are developed for program members interested in specific rules and requirements regarding DR activity (<http://www.pjm.com/training/training%20material.aspx>), along with a variety of other DR program information.

Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding program rules and requirements for metering and controls, assess a facility's ability to temporarily reduce electric load, and provide details on payments to be expected for participation in the program. Providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment of their own to help ensure compliance with all terms and conditions of a DR contract.

In our opinion, the facility is not a good candidate for DR curtailment.

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey’s Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 23 for a list of the eligible programs identified for each recommended ECM.

Figure 23 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	x		x			
ECM 2	Retrofit Fixtures with LED Lamps	x		x			
ECM 3	Vending Machine Control			x			

SmartStart is generally well-suited for implementation of individual measures or small group of measures. It provides flexibility to install measures at your own pace using in-house staff or a preferred contractor. Direct Install caters to small to mid-size facilities that can bundle multiple ECMs together. This can greatly simplify participation and may lead to higher incentive amounts, but requires the use of pre-approved contractors. The Pay for Performance (P4P) program is a “whole-building” energy improvement program designed for larger facilities. It requires implementation of multiple measures meeting minimum savings thresholds, as well as use of pre-approved consultants. The Large Energy Users Program (LEUP) is available to New Jersey’s largest energy users giving them flexibility to install as little or as many measures, in a single facility or several facilities, with incentives capped based on the entity’s annual energy consumption. LEUP applicants can use in-house staff or a preferred contractor.

Generally, the incentive values provided throughout the report assume the SmartStart program is utilized because it provides a consistent basis for comparison of available incentives for various measures, though in many cases incentive amounts may be higher through participation in other programs.

Brief descriptions of all relevant financing and incentive programs are located in the sections below. Further information, including most current program availability, requirements, and incentive levels can be found at: www.njcleanenergy.com/ci.

8.1 SmartStart

Overview

The SmartStart program offers incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program adds, removes or modifies incentives from year to year for various energy efficiency equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers

Electric Unitary HVAC

Gas Cooling

Gas Heating

Gas Water Heating

Ground Source Heat Pumps

Lighting

Lighting Controls

Refrigeration Doors

Refrigeration Controls

Refrigerator/Freezer Motors

Food Service Equipment

Variable Frequency Drives

Most equipment sizes and types are served by this program. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades.

Incentives

The SmartStart prescriptive incentive program provides fixed incentives for specific energy efficiency measures, whereas the custom SmartStart program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentive offerings for specific devices.

Since your facility is an existing building, only the retrofit incentives have been applied in this report. Custom measure incentives are calculated at \$0.16/kWh and \$1.60/therm based on estimated annual savings, capped at 50% of the total installed incremental project cost, or a project cost buy down to a one year payback (whichever is less). Program incentives are capped at \$500,000 per electric account and \$500,000 per natural gas account, per fiscal year.

How to Participate

To participate in the SmartStart program you will need to submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. Applicants may work with a contractor of their choosing and can also utilize internal personnel, which provides added flexibility to the program. Using internal personnel also helps improve the economics of the ECM by reducing the labor cost that is included in the tables in this report.

Detailed program descriptions, instructions for applying and applications can be found at: www.njcleanenergy.com/SSB.

8.2 Direct Install

Overview

Direct Install is a turnkey program available to existing small to medium-sized facilities with a peak electric demand that does not exceed 200 kW for any recent 12-month period. You will work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives and controls.

Incentives

The program pays up to **70%** of the total installed cost of eligible measures, up to \$125,000 per project. Direct Install participants will also be held to a fiscal year cap of \$250,000 per entity.

How to Participate

To participate in the Direct Install program you will need to contact the participating contractor who the region of the state where your facility is located. A complete list of Direct Install program partners is provided on the Direct Install website linked below. The contractor will be paid the measure incentives directly by the program which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Since Direct Install offers a free assessment of eligible measures, Direct Install is also available to small businesses and other commercial facilities too that may not be eligible for the more detailed facility audits provided by LGEA.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

8.3 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) is an alternate method for New Jersey's government agencies to finance the implementation of energy conservation measures. An ESIP is a type of "performance contract," whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. This is done in a manner that ensures that annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive in year one, and every year thereafter. ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs can be leveraged to help further reduce the total project cost of eligible measures.

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

- (1) Use an Energy Services Company or "ESCO."
- (2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.
- (3) Use a hybrid approach of the two options described above where the ESCO is utilized for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the Energy Savings Plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Entities should carefully consider all alternatives to develop an approach that best meets their needs. A detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP.

Please note that ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you may utilize NJCEP incentive programs to help further reduce costs when developing the ESP. You should refer to the ESIP guidelines at the link above for further information and guidance on next steps.

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

In 1999, New Jersey State Legislature passed the Electric Discount & Energy Competition Act (EDECA) to restructure the electric power industry in New Jersey. This law deregulated the retail electric markets, allowing all consumers to shop for service from competitive electric suppliers. The intent was to create a more competitive market for electric power supply in New Jersey. As a result, utilities were allowed to charge Cost of Service and customers were given the ability to choose a third-party (i.e. non-utility) energy supplier.

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for your facility's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third party electric suppliers. If your facility is purchasing electricity from a third-party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third-party electric suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

9.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey has also been deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate on a monthly basis. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third-party supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier is typically dependent upon whether a customer seeks budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third-party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility is not purchasing natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility is purchasing natural gas from a third-party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third-party natural gas suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

Location	Existing Conditions					Proposed Conditions					Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Multipurpose Room (Rm 107)	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.42	793	0.0	\$183.84	\$1,128.00	\$225.00	4.91
Multipurpose Room (Rm 107)	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen (Rm 107)	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.13	243	0.0	\$56.38	\$300.80	\$60.00	4.27
Table Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.06	122	0.0	\$28.19	\$150.40	\$30.00	4.27
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.03	61	0.0	\$14.09	\$75.20	\$15.00	4.27
Rm 10CC	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.13	243	0.0	\$56.38	\$300.80	\$60.00	4.27
Corridor	28	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	28	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.91	1,702	0.0	\$394.65	\$2,105.60	\$420.00	4.27
Corridor	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rm 126 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.06	122	0.0	\$28.19	\$150.40	\$30.00	4.27
Rm 120 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.06	122	0.0	\$28.19	\$150.40	\$30.00	4.27
Rm 118	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.32	608	0.0	\$140.95	\$752.00	\$150.00	4.27
Rm 118	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.32	608	0.0	\$140.95	\$752.00	\$150.00	4.27
Rm 117	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.32	608	0.0	\$140.95	\$752.00	\$150.00	4.27
Rm 116	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.32	608	0.0	\$140.95	\$752.00	\$150.00	4.27
Rm 115	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.32	608	0.0	\$140.95	\$752.00	\$150.00	4.27
Rm 114	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.32	608	0.0	\$140.95	\$752.00	\$150.00	4.27
Rm 112	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.13	243	0.0	\$56.38	\$300.80	\$60.00	4.27
Rm 111	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.13	243	0.0	\$56.38	\$300.80	\$60.00	4.27
Rm 109	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.23	425	0.0	\$98.66	\$526.40	\$105.00	4.27
Rm 108	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.32	608	0.0	\$140.95	\$752.00	\$150.00	4.27
Rm 113 Custodian	1	Incandescent Screw-in	Occupancy Sensor	60	1,068	Relamp	No	1	LED Screw-In Lamps: LED Screw-In Lamps	Occupancy Sensor	9	1,068	0.03	63	0.0	\$14.52	\$53.75	\$5.00	3.36
Rm 105	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.52	972	0.0	\$225.51	\$1,203.20	\$240.00	4.27
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.06	122	0.0	\$28.19	\$150.40	\$30.00	4.27
Rm 102 Main Office	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.16	304	0.0	\$70.47	\$376.00	\$75.00	4.27
Rm 102A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.06	122	0.0	\$28.19	\$150.40	\$30.00	4.27

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Rm 102B	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.06	122	0.0	\$28.19	\$150.40	\$30.00	4.27
Rm 102F	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.06	122	0.0	\$28.19	\$150.40	\$30.00	4.27
Rm 102C	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.06	122	0.0	\$28.19	\$150.40	\$30.00	4.27
Rm 102D	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.06	122	0.0	\$28.19	\$150.40	\$30.00	4.27
Rm 102E	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.06	122	0.0	\$28.19	\$150.40	\$30.00	4.27
Ext Recessed	4	Compact Fluorescent: (2) 4-pin base 26W CFL	Daylight Dimming	52	4,100	Relamp	No	4	LED Screw-In Lamps: 17W LED Pin Base Bulbs	Daylight Dimming	36	4,100	0.04	294	0.0	\$68.23	\$430.02	\$0.00	6.30
Wall Pack	13	Metal Halide: (1) 150W Lamp	Daylight Dimming	190	4,100	Fixture Replacement	No	13	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	57	4,100	1.13	8,152	0.0	\$1,890.60	\$5,078.80	\$1,300.00	2.00
Room 101 Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.03	61	0.0	\$14.09	\$75.20	\$15.00	4.27
Rm 121 Electrical Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,068	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,068	0.03	61	0.0	\$14.09	\$75.20	\$15.00	4.27
Pole Lighting	15	Metal Halide: (1) 400W Lamp	Daylight Dimming	458	4,100	Fixture Replacement	No	15	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	137	4,100	3.15	22,674	0.0	\$5,258.46	\$29,294.90	\$1,500.00	5.29

Electric HVAC Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis							
		System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
School (Classroom)	Classroom	16	Packaged Terminal AC	3.50		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
School (Classroom)	Classroom	16	Electric Resistance Heat		51.18	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
School	Storage, Electrical	2	Electric Resistance Heat		5.12	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

DHW Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions				Proposed Conditions					Energy Impact & Financial Analysis							
		System Quantity	System Type	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years		
Room 113	School	1	Storage Tank Water Heater (≤ 50 Gal)	No								0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00


Plug Load Inventory

Existing Conditions				
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
School	3	Small Freezer	500.0	No
School	11	TVs (wall)	120.0	No
School	1	Refrigerator	600.0	No
School	1	Water Cooler	500.0	No
School	3	Microwave	1,000.0	No
School	1	Toaster	850.0	No
School	2	Copy Machine	515.0	No
School	12	Computer	160.0	No
School	1	Refrigerator	750.0	No

Vending Machine Inventory & Recommendations

Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Rm 106C	1	Refrigerated	Yes	0.00	1,612	0.0	\$373.80	\$230.00	\$0.00	0.62
Rm 106C	1	Non-Refrigerated	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

Appendix B: ENERGY STAR® Statement of Energy Performance



LEARN MORE AT energystar.gov

ENERGY STAR® Statement of Energy Performance

90

ENERGY STAR®
Score¹

William Roper Early Education Learning Center

Primary Property Type: K-12 School
Gross Floor Area (ft²): 16,856
Built: 2013

For Year Ending: June 30, 2017
Date Generated: May 02, 2018

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

Property & Contact Information

Property Address William Roper Early Education Learning Center 211 E Lake Rd Pilesgrove, New Jersey 08098	Property Owner Woodstown-Pilesgrove Regional SD E Lake Road Woodstown, NJ 08098 () -	Primary Contact Rose Chin E Lake Road Woodstown, NJ 08098 856-769-0144 x22251 chin.r@woodstown.org
---	--	--

Property ID: 6264438

Energy Consumption and Energy Use Intensity (EUI)

Site EUI 30.4 kBtu/ft ²	Annual Energy by Fuel Electric - Grid (kBtu) 511,912 (100%)	National Median Comparison National Median Site EUI (kBtu/ft ²) 47.7 National Median Source EUI (kBtu/ft ²) 149.8 % Diff from National Median Source EUI -36%
Source EUI 95.4 kBtu/ft ²	Annual Emissions Greenhouse Gas Emissions (Metric Tons CO ₂ e/year) 57	

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

() -



Professional Engineer Stamp
(if applicable)