

**Frenchtown Board of Education
ENERGY ASSESSMENT
Edith Ort Thomas Elementary School**

For

**NEW JERSEY
BOARD OF PUBLIC UTILITIES**

CHA PROJECT NO. 24382

December 2012

Prepared by:



6 Campus Drive
Parsippany, NJ 07054

(973) 538-2120

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY	1
2.0 INTRODUCTION AND BACKGROUND	2
3.0 EXISTING CONDITIONS	3
3.1 Building - General.....	3
3.2 Utility Usage	3
3.3 HVAC Systems	4
3.4 Control Systems	4
3.5 Lighting/Electrical Systems	4
3.6 Domestic Hot Water Systems	4
3.7 Plumbing Fixtures.....	5
4.0 ENERGY CONSERVATION MEASURES.....	6
4.1 ECM-1: Boiler Conversion to Natural Gas.....	6
4.2 ECM-2: Motors & Drives Upgrade	6
4.3 ECM-3: EMS Recommissioning	7
4.4 ECM-4: Network Controller Software	7
4.5 ECM-5: Replace Kitchen Electric Domestic Hot Water Heater	8
4.6 ECM-6: Vending Machine Controller	8
4.7 ECM-7: Replace Door Seals	9
4.8 ECM-8: Lighting Replacement/Upgrades.....	9
4.9 ECM-9: Install Lighting Controls (Occupancy Sensors)	10
4.10 ECM-10: Lighting Replacements with Lighting Controls (Occupancy Sensors)	11
4.11 ECM-11: Install Low-Flow Plumbing Fixtures.....	11
5.0 PROJECT INCENTIVES.....	13
5.1 Incentives Overview.....	13
5.1.1 New Jersey Pay For Performance Program.....	13
5.1.2 New Jersey Smart Start Program	14
5.1.3 Direct Install Program	14
5.1.4 Energy Savings Improvement Plans (ESIP).....	15

6.0	ALTERNATIVE ENERGY SCREENING EVALUATION.....	16
6.1	Solar	16
6.1.1	Photovoltaic Rooftop Solar Power Generation.....	16
6.1.2	Solar Thermal Hot Water Plant	17
6.2	Demand Response Curtailment	18
7.0	EPA PORTFOLIO MANAGER	19
8.0	CONCLUSIONS & RECOMMENDATIONS	21

APPENDICES

A	Utility Usage Analysis, Energy Suppliers List
B	Equipment Inventory
C	ECM Calculations
D	New Jersey Pay For Performance Incentive Program
E	ESIP
F	Alternative Energy Screening
G	EPA Portfolio Manager

REPORT DISCLAIMER

This audit was conducted in accordance with the standards developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) for a Level II audit. Cost and savings calculations for a given measure were estimated to within $\pm 20\%$, and are based on data obtained from the owner, data obtained during site observations, professional experience, historical data, and standard engineering practice. Cost data does not include soft costs such as engineering fees, legal fees, project management fees, financing, etc.

A thorough walkthrough of the facility was performed, which included gathering nameplate information and operating parameters for all accessible equipment and lighting systems. Unless otherwise stated, model, efficiency, and capacity information included in this report were collected directly from equipment nameplates and /or from documentation provided by the owner during the site visit. Typical operation and scheduling information was obtained from interviewing facility staff and spot measurements taken in the field.

1.0 EXECUTIVE SUMMARY

The Frenchtown School District engaged CHA to perform an energy audit in connection with the New Jersey Board of Public Utilities' Local Government Energy Audit Program. This report details the results of the energy audit conducted for:

Building Name	Address	Square Feet	Construction Date
Edith Ort Thomas Elementary School	902 Harrison Str., Frenchtown, NJ	35,518	1925

The Energy Conservation Measures (ECMs) identified in this report will allow for a more energy efficient facility and if pursued have the opportunity to qualify for the New Jersey SmartStart Buildings Program and/or Direct Install Program. Potential annual savings of \$33,400 for the recommended ECMs may be realized with an average payback of 3.3 years. A summary of the costs, savings and paybacks for the recommended ECMs follows:

Summary of Energy Conservation Measures							
Energy Conservation Measure		Approx. Costs (\$)	Approx. Savings (\$/year)	Payback (Years) w/o Incentive	Potential Incentive (\$)*	Payback (Years) w/ Incentive	Recommended For Implementation
ECM-1	Boiler Conversion	60,700	16,800	3.6	0	3.6	Note A
ECM-2	Motors & Drives	13,600	5,800	2.3	700	2.2	X
ECM-3	EMS Re-Commissioning	17,800	5,100	3.5	0	3.5	X
ECM-4	Network Controller	1,500	800	1.9	0	1.9	X
ECM-5	Replace Kitchen Electric DHW Heater	400	600	0.7	50	0.0	X
ECM-6	Vending Machine Controller	350	500	0.7	0	0.7	X
ECM-7	Replace Door Seals	1,440	500	2.9	0	2.9	X
ECM-8	Lighting Replacement / Upgrades	7,000	900	7.8	385	7.4	
ECM-9	Install Lighting Controls (Occupancy Sensors)	5,700	5,200	1.1	980	0.9	
ECM-10	Lighting Replacements with Lighting Controls (Occupancy Sensors)	12,700	2,300	5.5	1,365	4.9	X
ECM-11	Install Low-Flow Plumbing Fixtures	1,500	1,000	1.5	0	1.5	X

* Incentives are based on NJ Smart Start Incentive Program

Note A: Boiler conversion is dependent on gas service which is not available at this time

2.0 INTRODUCTION AND BACKGROUND

New Jersey's Clean Energy Program is funded by the New Jersey Board of Public Utilities which supports energy efficiency and sustainability for Municipal and Local Government Energy Audits. The state of New Jersey has the support of a utility trust fund and is able to assist state and local authorities in reducing energy consumption while increasing comfort.

The Edith Ort Thomas Elementary School is a two story, 35,518 square foot school constructed in 1925 with a major mechanical upgrade in 2002-2003. The typical operating hours for the school are Monday through Friday 8:00 am to 4:00 pm.



3.0 EXISTING CONDITIONS

3.1 Building - General

The Edith Ort Thomas Elementary School is a 35,518 square foot, two story brick faced building. The windows are aluminum framed double glazing units. The roof is a rubber membrane style which the staff has indicated is in very poor condition. The majority of the building space is utilized for classrooms with some administrative office areas, gymnasium, cafeteria, and auditorium. The current occupancy level is 160 students and 30 employees with typical hours of operation of Monday through Friday 8 am to 4 pm. The school also operates a condensed 4 week summer program.

3.2 Utility Usage

The utility consumption for the school includes electricity, fuel oil for heating, propane for the kitchen and cafeteria, and potable water. Electricity is delivered by Jersey Central Power & Light and supplied by South Jersey Energy. Fuel oil is delivered by Allied Oil Company, and the propane for the kitchen and cafeteria by AmeriGas. There is no natural gas meter at the site.

For the 12-month period ranging from June 2011 through May 2012, the utilities usage for the building was as follows:

Actual Cost & Site Usage by Utility

Electric		
Annual Usage	214,520	kWh/yr
Annual Cost	33,200	\$
Blended Rate	0.155	\$/kWh
Supply Rate	0.116	\$/kWh
Demand Rate	5.08	\$/kW
Peak Demand	146.2	kW
Min. Demand	104.2	kW
Avg. Demand	135.1	kW
Fuel Oil		
Annual Usage	14,564	gallons/yr
Annual Cost	47,147	\$
Rate	3.24	\$/gallons
Water		
Annual Usage	167,000	gallons/yr
Annual Cost	1,906	\$
Rate	0.011	\$/gallons

Electrical usage was generally higher in the summer months when air conditioning equipment was operational. Fuel oil consumption was highest in winter months for heating. See Appendix A for a detailed utility analysis.

Under New Jersey's energy deregulation law, the supply portion of the electric (or natural gas) bill is separated from the delivery portion. With the supply portion open to competition, customers can shop around for the best price on their energy supplies. Their electric and natural gas distribution utilities will

still deliver those supplies through their wires and pipes – and respond to emergencies, should they arise – regardless of where those supplies are purchased. Purchasing your energy supplies from a company other than your electric or gas utility is purely an economic decision; it has no impact on the reliability or safety of your service. Additional information on selecting a third party energy supplier is available here: <http://www.state.nj.us/bpu/commercial/shopping.html>. See Appendix A for a list of third-party energy suppliers licensed by the Board of Public Utilities to sell within the building’s service area.

3.3 HVAC Systems

The original steam heating system was converted to a hot water system during a major mechanical renovation in 2002. The upgrade included a conversion of the existing HB Smith steam boiler to a hot water system and the addition of a new HB Smith cast iron hot water sectional boiler. The mechanical upgrade also included two new HVAC rooftop units for the auditorium and the gymnasium areas. The air conditioning for the majority of the areas is provided by a 97 ton air cooled chiller located in the rear of the building. The offices and computer lab each have dedicated split A/C systems for each area.

The corridor and restroom areas are not provided with cooling, but heated during the winter with hot water fan coils units.

Heating hot water and chilled water are distributed to the classroom unit ventilators by two 5 HP pumps with standard efficiency motors. The units are connected to a two-pipe piping distribution system which uses the same pumps for heating and cooling. The cooling flow rate is greater than the heating flow rate; therefore, both pumps are required to operate simultaneously to meet the cooling load in the summer.

The restrooms, classrooms, and corridors are ventilated using roof mounted exhaust fans and ducted pressure relief hoods.

Specifics on mechanical equipment can be found within the equipment inventory located in Appendix B.

3.4 Control Systems

The Honeywell Energy Management System (EMS) controls most of the HVAC equipment in the school. The system was installed in 2002 and utilizes some basic programs such as unit scheduling, occupied /unoccupied periods, economizer mode for the rooftops units, and demand control ventilation.

The unit ventilators for the classroom areas are operated with wall mounted thermostats that will override the EMS occupied setpoint.

3.5 Lighting/Electrical Systems

The majority of the fixtures in the school are T-8 fluorescents which are approximately 13 years’ old. Recently, some changes were made to the computer room, art room, and CST offices. The gymnasium utilizes 350 W metal halide fixtures, and auditorium fixtures are 75 W incandescents. The hallways are illuminated with 4-lamp T-8’s and 25 W compact fluorescent lights (CFLs) pendulum fixtures.

3.6 Domestic Hot Water Systems

Domestic hot water for the facility is provided by an 84 gallon A.O. Smith oil-fired water heater located in the mechanical room. The kitchen has a dedicated 40 gallon electric water heater.

3.7 Plumbing Fixtures

The majority of the plumbing fixtures in the school have been upgraded to low-flow rate fixtures. The low-flow fixtures include water closets with 1.6 gallons per flush (GPF) flow rate, urinals with a 1.0 GPF, and lavatory aerators listed at 2.0 gallons per minute (GPM). There are still approximately (9) water closets on the first floor, (4) on the second floor and (7) aerators on the first floor and (3) aerators on the second floor that are older, non-low-flow fixtures. Plumbing fixtures installed before the 90s consume more water than their modern counterparts. On average aerators installed before the 90s have a flow rate of 3GPM, urinals consume approximately 3 GPF and water closets typically use 5.5 GPF.

4.0 ENERGY CONSERVATION MEASURES

4.1 ECM-1: Boiler Conversion to Natural Gas

The facility currently uses oil fired boilers for space heating. This measure considers converting the boilers to also fire on natural gas. Elizabeth Gas recently installed a gas line nearby that could provide the school the ability to convert to less expensive natural gas as a future fuel source. There is currently a moratorium on road construction that prohibits installation of a gas connection to the school. When the moratorium is lifted, it is recommended revisiting this measure for implementation based on the short return on investment and maintenance savings that would result from converting to natural gas. The estimated cost of this measure is for converting the burners from oil to gas and all interior and exterior piping including piping and excavation work to connect to the natural gas main.

Boilers have an expected life of 20 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 291,300 gallons and \$336,000.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-1 Boiler Conversion to Natural Gas

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive*	Payback (without incentive)	Payback (with incentive)
	# 2	Electric	Nat Gas	Total	\$	\$		\$	Years	Years
	Oil	kW	Therms	\$						
\$										
60,700	14,564	0	-20,200	16,800	0	16,800	4.5	0	3.6	3.6

* There are currently no incentives available for fuel conversion from New Jersey Clean Energy; however Elizabeth Gas may offer custom incentives to offset some of the cost of the burner conversion.

This measure is recommended.

4.2 ECM-2: Motors & Drives Upgrade

The school utilizes the same system pumps to supply heating hot water (HHW) and chilled water (CW) to the terminal units. The current system consists of (2) 5 HP constant speed pumps.

The HHW/CW pumps serving the HVAC systems operate at constant speed; however, the building load does not require maximum flow to maintain temperatures at all times. The motors should be replaced with high efficient, inverter duty motors with addition of variable speed drives (VSDs). The VSDs have the ability to slow motor speed and decrease water flow to the HVAC system under low load conditions resulting in a reduction in electrical energy consumption by the pump motors.

The assumption of this calculation is that the operating hours, motor horsepower, and capacity stay the same. The energy savings are seen from operating higher efficiency motors and reducing power consumption with a variable speed pumping system compared to the existing constant volume pumps.

Motors and drives have an expected life of 15 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 473,700 kWh and \$76,800.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-2 Motors & Drives Upgrade

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	ROI	Incentive*	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	# 2	Total	Savings					
\$	kWh	kW	Gallons	\$	\$	\$		\$	Years	Years
13,600	37,405	0	0	5,800	0	5,800	5.4	700	2.3	2.2

* Incentive shown is per the New Jersey Smart Start Program. See section 5.0 for other incentive opportunities.

This measure is recommended.

4.3 ECM-3: EMS Recommissioning

The existing EMS was installed in 2002. The hardware components of an EMS system such as room temperature sensors, modulating valves or damper motors can drift out of calibration over time and cause unnecessary energy use by system components. The typical EMS system should have a periodic check of all components including hardware and software for maximum system performance and HVAC system energy savings.

EMS recommissioning has an expected life of 15 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 83,700 kWh, 19,700 gallons of fuel and \$76,800.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-3 EMS Recommissioning

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	ROI	Incentive*	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	# 2	Total	Savings					
\$	kWh	kW	Gallons	\$	\$	\$		\$	Years	Years
17,800	5,578	0	1,311	5,100	0	5,100	3.3	0	3.5	3.5

* There are currently no New Jersey Smart Start Program incentives available for this measure.

This measure is recommended.

4.4 ECM-4: Network Controller Software

Personal computers can consume large amounts of electricity unnecessarily if left on for long periods of time when not in use, even in sleep mode. This measure assessed implementation of proprietary network manager software that monitors the usage and shuts off all computers and monitors that are inactive. This software does not effect on daily network operation and does not compromise security firewalls.

Network controller software has an expected life of 5 years due to software upgrades, and total energy savings over the life of the project are estimated at 27,000 kWh and \$4,200.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-4 Network Controller Software

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive*	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
1,500	5,400	0	0	800	0	800	1.8	0	1.9	1.9

* There are currently no New Jersey Smart Start Program incentives available for this measure.

This measure is recommended.

4.5 ECM-5: Replace Kitchen Electric Domestic Hot Water Heater

The kitchen utilizes a dedicated 40 gallon electric water heater. Although electric water heaters are nearly 100% efficient, the use of electricity for domestic hot water (DHW) is less cost effective than using fossil fuel. Propane gas, which is currently used for cooking only, would be accessible for this conversion. Additionally, the U.S. Department of Energy has found that 2.5% of stored capacity is lost every hour during DHW heater standby. This value was applied to the total volume of the existing electric DHW heater storage tank to determine the annual standby losses. This measure evaluated replacing the existing tank type electric DHW heater with a tankless propane fired water heater to eliminate standby losses and produce DHW more efficiently.

The new water heater will require a new propane gas connection, water piping modifications, venting, and electrical connections.

Domestic hot water heaters have an expected life of 20 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 198,900 kWh and \$11,100.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-5 Replace Kitchen Electric DHW Heater

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive*	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	LPG Gals	Total \$						
\$					\$	\$		\$		
400	9,943	4.5	-270	600	0	600	26.8	50	0.7	0.6

* Incentive shown is per the New Jersey Smart Start Program. See section 5.0 for other incentive opportunities.

This measure is recommended.

4.6 ECM-6: Vending Machine Controller

There are currently (2) cold drink vending machines located in the cafeteria of the school. Installing energy management controllers for all vending beverage and snack machines was assessed. The

installation of these devices will decrease operating costs by reducing the electrical energy consumption during unoccupied hours. The refrigerated beverage vending machines use considerably less energy and will be comparable in energy performance to the new Energy Star qualified machines.

The vending miser has an expected life of 5 years and total energy savings over the life of the project are estimated at 16,100 kWh, and \$2,500.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-6 Vending Machine Controller

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive*	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$				\$	\$	\$		\$		
350	3,229	0	0	500	0	500	6.1	0	0.7	0.7

* There are currently no New Jersey Smart Start Program incentives available for this measure.

This measure is recommended.

4.7 ECM-7: Replace Door Seals

The seals around exterior doors wear out over time causing unwanted infiltration of unconditioned outside air and exfiltration of conditioned air resulting in increased heating and cooling energy usage. This measure calculated the replacement of 4 exterior door seals.

Door seals have an expected life of 5 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 1,120 kWh, 675 gallons of oil, and \$2,500.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-7 Replace Door Seals

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	#2 Oil Gals	Total \$						
\$				\$	\$	\$		\$		
1,440	226	0	135	500	0	500	0.7	0	2.9	2.9

* There are currently no New Jersey Smart Start Program incentives available for this measure.

This measure is recommended.

4.8 ECM-8: Lighting Replacement/Upgrades

A comprehensive fixture survey of the entire building was conducted. The number of fixtures, locations, and existing wattage were identified. Inefficient lighting fixtures identified included T-8 U-tube lamps, metal halide lamps, incandescent screw type bulbs, and incandescent exit signs. Most of the lighting

fixtures include standard 4-foot T-8 fixtures with 32-watt bulbs. While these are industry standard, newer high performance T-8 fixtures with 28-watt bulbs exist. Retrofitting fixtures that utilize standard T-8 lamps would require replacement with Super T-8 ballasts and lamps. This is not recommended due to the cost and relatively low savings, but should be done as existing T-8 fixtures fail

Energy savings for this measure were calculated by applying the existing and proposed fixture wattages to estimated time of operation. The supporting calculations, including assumptions for lighting hours and annual energy usage for each fixture are provided in Appendix C.

Retrofitting fixtures that utilize T-8 U-tube lamps would be replaced with a Super T-8 equivalent; metal halide lamps would be replaced with T-5 fixtures, incandescent bulbs would be replaced with compact fluorescent spiral light bulbs or flood lamps where applicable.

Energy efficient lighting has an expected life of 15 years according to the manufacturer. The total energy savings over the life of the project are estimated at 95,500 kWh and \$14,800.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-8 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
7,000	6,368	3	0	900	0	900	0.2	385	7.8	7.4

* Incentive shown is per the New Jersey Smart Start Program. See section 5.0 for other incentive opportunities.

This measure is not recommended in lieu of ECM-10.

4.9 ECM-9: Install Lighting Controls (Occupancy Sensors)

The lighting survey determined that lighting in areas such as classrooms, offices, and restrooms is typically operated continuously throughout the day regardless of occupancy. Therefore, installing occupancy sensors in these spaces to turn off lights when the areas are unoccupied was assessed.

This calculation is similar to that utilized in section 4.8. The energy savings for this measure was calculated by applying the known existing fixture wattages in the space to the estimated existing and proposed times of operation for each fixture. The difference between the two values resulted in annual savings. A total of (28) wall-mounted occupancy sensor is required for this measure.

Occupancy sensors have an expected life of 15 years according to the manufacturer. The total energy savings over the life of the project are estimated at 508,200 kWh and \$78,600.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized as follows:

ECM-9 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
5,700	33,879	0	0	5,200	0	5,200	12.8	980	1.1	0.9

* Incentive shown is per the New Jersey Direct Install Program. See section 5.0 for other incentive opportunities.

This measure is not recommended in lieu of ECM-10.

4.10 ECM-10: Lighting Replacements with Lighting Controls (Occupancy Sensors)

The energy and cost savings for occupancy sensors and lighting upgrades are not cumulative. This measure calculates the combination of ECM-8 and ECM-9 resulting in a maximum energy and demand reduction.

The lighting retrofits and controls have a life expectancy of 15 years according to the manufacturer, and total energy savings over the life of the project are estimated at 271,400 kWh and \$52,000.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-10 Lighting Replacements with Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive*	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
12,700	18,091	3	0	2,300	0	2,300	2.3	1,365	5.5	4.9

* Incentive shown is per the New Jersey Smart Start Program. See section 5.0 for other incentive opportunities.

This measure is recommended.

4.11 ECM-11: Install Low-Flow Plumbing Fixtures

The facility has a mixture of older and newer style plumbing fixtures in the school. The older style fixtures consume more water than modern plumbing fixtures. It was determined that there is a total of (13) water closets with an average water consumption of 5.5 gpf and (10) aerators with a flow of 3 gpm. Per the number of occupants, it was estimated that each water closet and aerator is utilized approximately 4 times per day.

The water savings associated from replacing these fixtures with low-flow fixtures was calculated by taking the difference of the annual water usage for the proposed and base case. The basis of this calculation is the number of times each fixture is used, gallons per use, and number of

fixtures. Replacing the existing plumbing fixtures in the school with 1.28 gpf water closets and 1.5 gpm aerators would save 91 kGal annually.

Toilets and faucets have an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 1,365 KGal and \$15,000.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-11 Install Low Flow Plumbing

Budgetary Cost	Annual Utility Savings					Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive*	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Water	Total						
\$	kW	kWh	Therms	kGals	\$	\$	\$		\$	Years	Years
1,498	0	0	0	91	1,000	0	1,000	(1.0)	0	1.5	1.5

* There is no incentive available through the New Jersey Smart Start or Direct Install Programs for this ECM. See section 5.0 for other incentive opportunities.

This measure is recommended.

5.0 PROJECT INCENTIVES

5.1 Incentives Overview

5.1.1 New Jersey Pay For Performance Program

The facility will be eligible for incentives from the New Jersey Office of Clean Energy. The most significant incentives are available from the New Jersey Pay for Performance (P4P) Program. The P4P program is designed for qualified energy conservation projects applied to facilities whose demand in any of the preceding 12 months exceeds 100 kW. This average minimum has been waived for buildings owned by local governments or municipalities and non-profit organizations, however. Facilities that meet this criterion must also achieve a minimum performance target of 15% energy reduction by using the EPA Portfolio Manager benchmarking tool before and after implementation of the measure(s). If the participant is a municipal electric company customer, and a customer of a regulated gas New Jersey Utility, only gas measures will be eligible under the Program. Available incentives are as follows:

Incentive #1: Energy Reduction Plan – This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP).

- Incentive Amount: \$0.10/SF
- Minimum incentive: \$5,000
- Maximum Incentive: \$50,000 or 50% of Facility annual energy cost

The standard incentive pays \$0.10 per square foot, up to a maximum of \$50,000, not to exceed 50% of facility annual energy cost, paid after approval of application. For building audits funded by the New Jersey Board of Public Utilities, which receive an incentive toward performance of the energy audit, facilities are only eligible for an additional \$0.05 per square foot, up to a maximum of \$25,000, rather than the standard incentive noted above.

Incentive #2: Installation of Recommended Measures – This incentive is based on projected energy savings as determined in Incentive #1 (Minimum 15% savings must be achieved), and is paid upon successful installation of recommended measures.

Electric

- Base incentive based on 15% savings: \$0.09/ per projected kWh saved.
- For each % over 15% add: \$0.005 per projected kWh saved.
- Maximum incentive: \$0.11/ kWh per projected kWh saved

Gas

- Base incentive based on 15% savings: \$0.90/ per projected Therm saved.
- For each % over 15% add: \$0.05 per projected Therm saved.
- Maximum incentive: \$1.25 per projected Therm saved

Incentive cap: 25% of total project cost

Incentive #3: Post-Construction Benchmarking Report – This incentive is paid after acceptance of a report proving energy savings over one year utilizing the Environmental Protection Agency (EPA) Portfolio Manager benchmarking tool.

Electric

- Base incentive based on 15% savings: \$0.09/ per projected kWh saved.
- For each % over 15% add: \$0.005 per projected kWh saved.
- Maximum incentive: \$0.11/ kWh per projected kWh saved

Gas

- Base incentive based on 15% savings: \$0.90/ per projected Therm saved.
- For each % over 15% add: \$0.05 per projected Therm saved.
- Maximum incentive: \$1.25 per projected Therm saved

Incentives #2 and #3 can be combined to yield additive savings.

Total P4P incentives are summarized below for the recommended measures:

	Incentives \$		
	Elec	Gas	Total
Incentive #1	\$0	\$0	\$1,776
Incentive #2	\$8,786	\$0	\$8,786
Incentive #3	\$8,786	\$0	\$8,786
Total All Incentives	\$17,572	\$0	\$19,347

The recommended ECM's meet the minimum savings of 15% and therefore the building would be eligible for incentives #2 and #3. See Appendix D for additional details.

5.1.2 New Jersey Smart Start Program

For this program, specific incentives for energy conservation measures are calculated on an individual basis utilizing the 2011 New Jersey Smart Start incentive program. This program provides incentives dependent upon mechanical and electrical equipment. If applicable, incentives from this program are reflected in the ECM summaries and attached appendices.

If the complex qualifies and enters into the New Jersey Pay for Performance Program, all energy savings will be included in the total site energy reduction, and savings will be applied towards the Pay for Performance incentive. A project is not applicable for both New Jersey incentive programs.

5.1.3 Direct Install Program

The Direct Install Program targets small and medium sized facilities where the peak electrical demand does not exceed 150 kW in any of the previous 12 months. Buildings must be located in New Jersey and served by one of the state's public, regulated electric or natural gas utility companies. On a case-by-case basis, the program manager may accept a project for a customer that is within 10% of the 150 kW peak demand threshold.

Direct Install is funded through New Jersey's Clean Energy Program and is designed to provide capital for building energy upgrade projects to fast track implementation. The program will pay up to 70% of the costs for lighting, HVAC, motors, natural gas, refrigeration, and other equipment upgrades with higher efficiency alternatives. If a building is eligible for this funding, the Direct Install Program can significantly reduce the implementation cost of energy conservation projects.

The program pays 70% of each project cost up to \$75,000 per electrical utility account; total funding for each year is capped at \$250,000 per customer. Installations must be completed by a Direct Install participating contractor, a list of which can be found on the New Jersey Clean Energy Website

at <http://www.njcleanenergy.com>. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this document.

This program is applicable to the Edith Ort Thomas Elementary School based on the school's average peak demand of 146 kW.

5.1.4 Energy Savings Improvement Plans (ESIP)

The Energy Savings Improvement Program (ESIP) allows government agencies to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. Under the recently enacted Chapter 4 of the Laws of 2009 (the law), the ESIP provides all government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources.

ESIP allows local units to use "energy savings obligations" to pay for the capital costs of energy improvements to their facilities. This can be done over a maximum term of 15 years. Energy savings obligations are not considered "new general obligation debt" of a local unit and do not count against debt limits or require voter approval. They may be issued as refunding bonds or leases. Savings generated from the installation of energy conservation measures pay the principal of and interest on the bonds; for that reason, the debt service created by the ESOs is not paid from the debt service fund, but is paid from the general fund.

For local governments interested in pursuing an ESIP, the first step is to perform an energy audit. Pursuing a Local Government Energy Audit through New Jersey's Clean Energy Program is a valuable first step to the ESIP approach. The "Local Finance Notice" outlines how local governments can develop and implement an ESIP for their facilities (see Appendix E). The ESIP can be prepared internally if the entity has qualified staff. If not, the ESIP must be implemented by an independent contractor and not by the energy savings company producing the Energy Reduction Plan.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Local units should carefully consider all alternatives to develop an approach that best meets their needs.

6.0 ALTERNATIVE ENERGY SCREENING EVALUATION

6.1 Solar

6.1.1 Photovoltaic Rooftop Solar Power Generation

The facility was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter. The building's roof has sufficient room to install a solar cell array. The facility received funding from a source for historical buildings and cannot change the historical appearance of the facility. Installing panels on the roof is not an option however; construction of a canopy over the parking lot to support PV panels would be the only viable option.

The PVWATTS solar power generation model was utilized to calculate PV power generation. The closest city available in the model is Philadelphia, Pennsylvania and a fixed tilt array type was utilized to calculate energy production. The PVWATT solar power generation model is provided in Appendix F.

Installation of (PV) arrays in the state of New Jersey will allow the owner to participate in the New Jersey solar renewable energy certificates program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production, these credits can be traded for period of 15 years from the date of installation. The average SREC value per credit is estimated to be about \$120/ SREC per year based on current market data and this number was utilized in the cash flow for this report.

The existing electric load justifies the use of 50 kW PV solar array. The system costs for PV installations were derived from contractor budgetary pricing in the state of New Jersey for an estimate of the total cost of a system installation. It should be noted that the cost of installation is currently is about \$4 per watt or \$4,000 per kW of installed system. There may be additional cost considerations that need to be addressed. The typical life span of a PV panel is approximately 20 years; however, the inverter that converts DC electricity to AC has a life span of 10 to 12 years.

The implementation cost and savings related to this ECM are presented in Appendix F and summarized as follows:

Photovoltaic (PV) Rooftop Solar Power Generation

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	# 2 Gallons	Total \$						
\$					\$	\$		\$		
\$200,000	0.0	98,303	0	\$15,200	0	\$15,200	\$0	\$11,796	13.2	7.4

* 30% federal tax credit

** Solar Renewable Energy Certificate Program (SREC) for 2012 is \$120/1000kwh

The proposed PV system would require 100 square feet per kW of PV panel or a total of 5,000 square feet of open space. The existing roof would need a structural analysis to ensure that it can support the additional weight of the panels.

Installing a photovoltaic system is recommended if SREC credits can be secured to offset the high installation cost of the system.

6.1.2 Solar Thermal Hot Water Plant

Active solar thermal systems use solar collectors to gather the sun's energy to heat fluids or air. The absorber in the collector converts the sun's energy into heat and is then transferred by circulating fluids or air to another location for immediate use or storage for later utilization. The typical application for active solar thermal energy include providing hot water, heating swimming pools, space heating, and preheating air in residential and commercial buildings.

Standard solar hot water systems are typically composed of solar collectors, heat storage vessel, piping, circulators, and controls. These systems are typically integrated to work alongside a conventional heating system that provides heat when solar resources are not sufficient. The solar collectors are usually placed on the roof of the building, oriented south, and tilted around the site's latitude to maximize the amount of radiation collected on a yearly basis.

There are several options that exist for using active solar thermal systems for space heating. The most common method involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system). The most practical system would transfer the heat from the panels to thermal storage tanks and transfer solar produced thermal energy to use for domestic hot water production. DHW is presently produced by electric or fossil fuel heaters therefore this measure would offer utility savings.

Currently incentives are not available for installation of thermal solar systems. The federal government currently offers a tax credit of 30% of installation cost for the thermal applications.

The estimated useful life of the Solar Thermal system is 20 years. This term was used to calculate the return on investment.

The implementation cost and savings related to this ECM are presented in Appendix F and summarized as follows:

Solar Thermal Hot Water (Main DHW)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	# 2 Gallons	Total \$						
\$					\$	\$		\$		
20,000	0	0	368	1,288	0	1,288	0.3	0	15.5	15.5

* There are currently no New Jersey Smart Start Program incentives available for this measure.

This measure is not recommended.

Solar Thermal Hot Water (Kitchen DHW)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	# 2	Total	Savings					
\$	kWh	kW	Gallons	\$	\$	\$		\$	Years	Years
20,000	18,980	0	0	2,847	0	2,847	1.8	0	7.0	7.0

* There are currently no New Jersey Smart Start Program incentives available for this measure.

This measure is recommended.

6.2 Demand Response Curtailment

Presently the electricity is delivered to the school by Atlantic City Electric which receives the electricity from the regional power grid RFC. Atlantic City Electric is the regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia including the State of New Jersey.

Utility Curtailment is an agreement with the utility provider's regional transmission organization and an approved Curtailment Service Provider (CSP) to shed electrical load by either turning major equipment off or energizing all or part of a facility utilizing an emergency generator; which would reduce the electrical demand on the utility grid. This program would benefit the utility company during high demand periods and the utility provider offers incentives to the CSP to participate in this program. Enrollment in this program would require program participants to drop electrical load or turn on emergency generators during high electrical demand conditions or during emergencies. The program also would require that program participants reduce their required load or run emergency generators with notice to test the system.

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. This measure is not recommended because the facility does not have adequate load to meet the required minimum load reduction.

7.0 EPA PORTFOLIO MANAGER

The EPA Portfolio Manager benchmarking tool was used to assess the building's energy performance. Portfolio Manager provides a Site and Source Energy Use Intensity (EUI), as well as an Energy Star performance rating for qualifying building types. The EUIs are provided in kBtu/ft²/year, and the performance rating represents how energy efficient a building is on a scale of 1 to 100, with 100 being the most efficient. In order for a building to receive an Energy Star label, the energy benchmark rating must be at least 75. As energy use decreases from implementation of the proposed ECMs, the Energy Star rating will increase.

The Site EUI is the amount of heat and electricity consumed by a building as reflected in utility bills. Site energy may be delivered to a facility in the form of primary energy, which is raw fuel burned to create heat or electricity (such as natural gas or oil), or as secondary energy, which is the product created from a raw fuel (such as electricity or district steam). Site EUI is a measure of a building's annual energy utilization per square foot. Site EUI is a good measure of a building's energy use and is utilized regularly for comparison of energy performance for similar building types.

$$\text{Site Energy Intensity} = \frac{(\text{Electric Usage in kBtu} + \text{Natural Gas in kBtu})}{\text{Building Square Footage}}$$

To provide an equitable comparison for different buildings with varying proportions of primary and secondary energy consumption, the Portfolio Manager uses the convention of Source EUIs. The source energy also accounts for all losses incurred in production, storage, transmission, and delivery of energy to the site; which provides an equivalent measure for various types of buildings with different energy sources.

$$\text{Source Energy Intensity} = \frac{(\text{Electric Usage in kBtu} \times \text{Site/Source Ratio} + \text{Natural Gas in kBtu} \times \text{Site/Source Ratio})}{\text{Building Square Footage}}$$

The EPA Score, Site EUI, and Source EUI for Edith Ort Thomas Elementary School are as follows:

Energy Intensity	Edith Ort Thomas Elementary School	National Average
EPA Score	74	50
Site (kBtu/sf/year)	77	98
Source (kBtu/sf/year)	126	160

The Edith Ort Thomas Elementary School is considered a better than average energy consumer by the EPA Portfolio Manager. For the elementary school to qualify for the Energy Star label the EPA score is required to be above 75. There are several energy conservation measures recommended in this report, that if implemented will further reduce the energy use intensity and increase the EPA score of the school.

The Portfolio Manager account can be accessed by entering the username and password shown below at the login screen of the Portfolio Manager website (<https://www.energystar.gov/istar/pmpam/>).

A full EPA Energy Star Portfolio Manager Report is located in Appendix G.

The user name (“frenchtown”) and password (“energystar”) for the building’s EPA Portfolio Manager Account has been provided to Ms. Susan Schaffner, Business Administrator/Board Secretary for the Frenchtown Board of Education.

8.0 CONCLUSIONS & RECOMMENDATIONS

The energy audit conducted by CHA at the Edith Ort Thomas Elementary School identified potential ECMs for boiler conversion to natural gas, lighting and controls replacement, motors and drives, energy management system recommissioning, electric domestic hot water heater replacement, vending machine controller, network controller software, door seals and low flow plumbing fixtures. Potential annual savings of \$33,400 may be realized for the recommended ECMs, with a summary of the costs, savings, and paybacks as follows:

ECM-1 Boiler Conversion to Natural Gas

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	ROI	Incentive*	Payback (without incentive)	Payback (with incentive)
	# 2 Oil	Electric kW	Nat Gas Therms	Total \$	Savings \$	\$		\$	Years	Years
\$										
60,700	14,564	0	-20,200	16,800	0	16,800	4.5	0	3.6	3.6

* There are currently no New Jersey Smart Start Program incentives available for this measure.

ECM-2 Motors & Drives Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	ROI	Incentive*	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	# 2 Gallons	Total \$	Savings \$	\$		\$	Years	Years
\$										
13,600	37,405	0	0	5,800	0	5,800	5.4	700	2.3	2.2

* Incentive shown is per the New Jersey Smart Start Program. See section 5.0 for other incentive opportunities.

ECM-3 EMS Recommissioning

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	ROI	Incentive*	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	# 2 Gallons	Total \$	Savings \$	\$		\$	Years	Years
\$										
17,800	5,578	0	1,311	5,100	0	5,100	3.3	0	3.5	3.5

* Incentive shown is per the New Smart Start Program. See section 5.0 for other incentive opportunities.

ECM-4 Network Controller Software

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	ROI	Incentive*	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$	Savings \$	\$		\$	Years	Years
\$										
1,500	5,400	0	0	800	0	800	1.8	0	1.9	1.9

* There are currently no New Jersey Smart Start Program incentives available for this measure.

ECM-5 Replace Kitchen Electric DHW Heater

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive*	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	LPG Gals	Total \$						
\$					\$	\$		\$		
400	9,943	4.5	-270	600	0	600	26.8	50	0.7	0.6

* Incentive shown is per the New Jersey Smart Start Program. See section 5.0 for other incentive opportunities.

ECM-6 Vending Machine Controller

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive*	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
350	3,229	0	0	500	0	500	6.1	0	0.7	0.7

* There are currently no New Jersey Smart Start Program incentives available for this measure.

ECM-7 Replace Door Seals

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	#2 Oil Gals	Total \$						
\$					\$	\$		\$		
1,440	226	0	135	500	0	500	0.7	0	2.9	2.9

* There are currently no New Jersey Smart Start Program incentives available for this measure

ECM-10 Lighting Replacements with Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive*	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
12,700	18,091	3	0	2,300	0	2,300	2.3	1,365	5.5	4.9

* Incentive shown is per the New Jersey Smart Start Program. See section 5.0 for other incentive opportunities.

ECM-11 Install Low Flow Plumbing

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive*	Payback (without Incentive) Years	Payback (with Incentive) Years
	kWh	Natural Gas Therms	Water kGals	Total \$						
\$					\$	\$		\$		
1,498	0	0	91	1,000	0	1,000	(1.0)	0	1.5	1.5

* There are currently no New Jersey Smart Start Program incentives available for this measure.

APPENDIX A

Utility Usage Analysis

Third Party Energy Suppliers List

Frenchtown BOE
902 Harrison St, Frenchtown, NJ 08825

Annual Utilities
12-month Summary

Electric		
Annual Usage	214,520	kWh/yr
Annual Cost	33,166	\$
Blended Rate	0.155	\$/kWh
Consumption Rate	0.116	\$/kWh
Demand Rate	5.08	\$/kW
Peak Demand	146.2	kW
Min. Demand	104.2	kW
Avg. Demand	135.1	kW
Fuel Oil		
Annual Usage	14,564	gallons/yr
Annual Cost	47,147	\$
Rate	3.237	\$/gallon
Water		
Annual Usage	167,000	gallons/yr
Annual Cost	1,906	\$
Rate	0.011	\$/gallon

Frenchtown BOE

902 Harrison St, Frenchtown, NJ 08825

Utility Bills: Account Numbers

<u>Account Number</u>	<u>School Building</u>	<u>Location</u>	<u>Type</u>	<u>Notes</u>
100002362620	Edith Ort Thomas Elementary School	902 Harrison St, Frenchtown, NJ 08825	Electricity	
433262	Edith Ort Thomas Elementary School	903 Harrison St, Frenchtown, NJ 08825	Fuel Oil #2	
18-1072297-3	Edith Ort Thomas Elementary School	904 Harrison St, Frenchtown, NJ 08825	Water	

Frenchtown BOE
902 Harrison St, Frenchtown, NJ 08825

For Service at:
Account No.:
Meter No.:
Electric Service

Edith Ort Thomas Elementary School
100002362620
G21248956

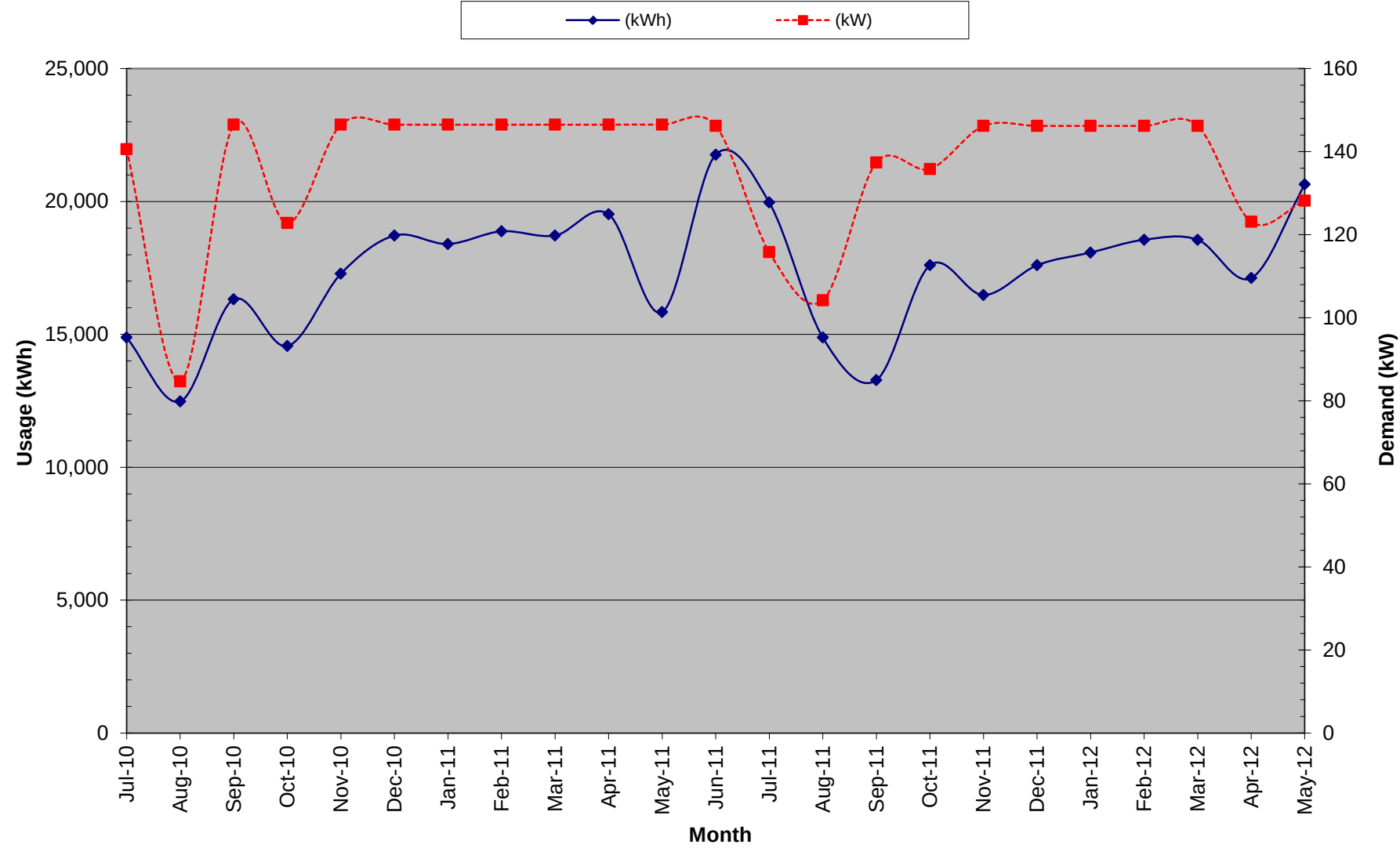
Delivery -
Supplier -

JCP&L
South Jersey Energy

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	Consumption (kWh)	Demand (kW)	Delivery (\$)	Supplier (\$)	Total (\$)	Consumption (\$)	Demand (\$)	Blended Rate (\$/kWh)	Consumption (\$/kWh)	Demand (\$/kW)
July-10	14,880	140.60	1,510.90	1,561.66	3,072.56	2,096.80	975.76	0.21	0.14	6.94
August-10	12,480	84.70	1,047.73	1,309.78	2,357.51	1,769.69	587.82	0.19	0.14	6.94
September-10	16,320	146.50	1,596.99	1,712.78	3,309.77	2,293.06	1,016.71	0.10	0.14	6.94
October-10	14,560	122.80	1,315.00	1,528.07	2,843.07	2,048.55	794.52	0.20	0.14	6.47
November-10	17,280	146.50	1,069.88	1,813.54	2,883.42	2,420.48	462.94	0.17	0.14	3.16
December-10	18,720	146.50	1,116.20	1,964.66	3,080.86	2,617.92	462.94	0.16	0.14	3.16
January-11	18,400	146.50	1,106.12	1,931.08	3,037.20	2,574.26	462.94	0.17	0.14	3.16
February-11	18,880	146.50	1,121.23	1,981.46	3,102.69	2,639.75	462.94	0.16	0.14	3.16
March-11	18,720	146.50	1,021.53	1,964.66	2,986.19	2,523.25	462.94	0.16	0.13	3.16
April-11	19,520	146.50	973.98	2,048.62	3,022.60	2,559.66	462.94	0.15	0.13	3.16
May-11	15,840	146.50	889.72	1,459.34	2,349.06	1,886.12	462.94	0.15	0.12	3.16
June-11	21,760	146.20	1,581.61	2,004.75	3,586.36	2,571.73	1,014.63	0.16	0.12	6.94
July-11	19,960	115.80	1,260.36	1,562.52	2,822.88	2,019.23	803.65	0.14	0.10	6.94
August-11	14,880	104.20	1,132.06	1,370.89	2,502.95	1,779.80	723.15	0.17	0.12	6.94
September-11	13,280	137.40	1,325.87	1,223.49	2,549.36	1,670.73	878.63	0.19	0.13	6.39
October-11	17,600	135.80	1,345.08	1,621.49	2,966.57	2,087.94	878.63	0.17	0.12	6.47
November-11	16,480	146.20	907.65	1,518.30	2,425.95	1,963.96	461.99	0.15	0.12	3.16
December-11	17,600	146.20	937.73	1,621.49	2,559.22	2,097.23	461.99	0.15	0.12	3.16
January-12	18,080	146.20	941.69	1,665.71	2,607.40	2,145.41	461.99	0.14	0.12	3.16
February-12	18,560	146.20	946.60	1,709.93	2,656.53	2,194.54	461.99	0.14	0.12	3.16
March-12	18,560	146.20	888.24	1,709.93	2,598.17	2,136.18	461.99	0.14	0.12	3.16
April-12	17,120	123.10	1,158.53	1,577.27	2,735.80	1,939.34	796.46	0.16	0.11	6.47
May-12	20,640	128.20	1,253.24	1,901.56	3,154.80	2,325.35	829.45	0.15	0.11	6.47
Total (All)	400,120	146.50	\$26,447.94	\$38,762.98	\$65,210.92	\$50,360.98	\$14,849.94	\$0.16	\$0.13	\$4.73
Total (last 12-months)	214,520	146.20	\$13,678.66	\$19,487.33	\$33,165.99	\$24,931.44	\$8,234.55	\$0.15	\$0.12	\$5.08
Notes	1	2	3	4	5	6	7	8	9	10

- 1.) Number of kWh of electric energy used per month
- 2.) Number of kW of power measured
- 3.) Electric charges from Delivery provider
- 4.) Electric charges from Supply provider
- 5.) Total charges (Delivery + Supplier)
- 6.) Charges based on the number of kWh of electric energy used
- 7.) Charges based on the number of kW of power measured
- 8.) Total Charges (\$) / Consumption (kWh)
- 9.) Consumption Charges (\$) / Consumption (kWh)
- 10.) Demand Charges (\$) / Demand (kW)

Electric Usage - Elementary School

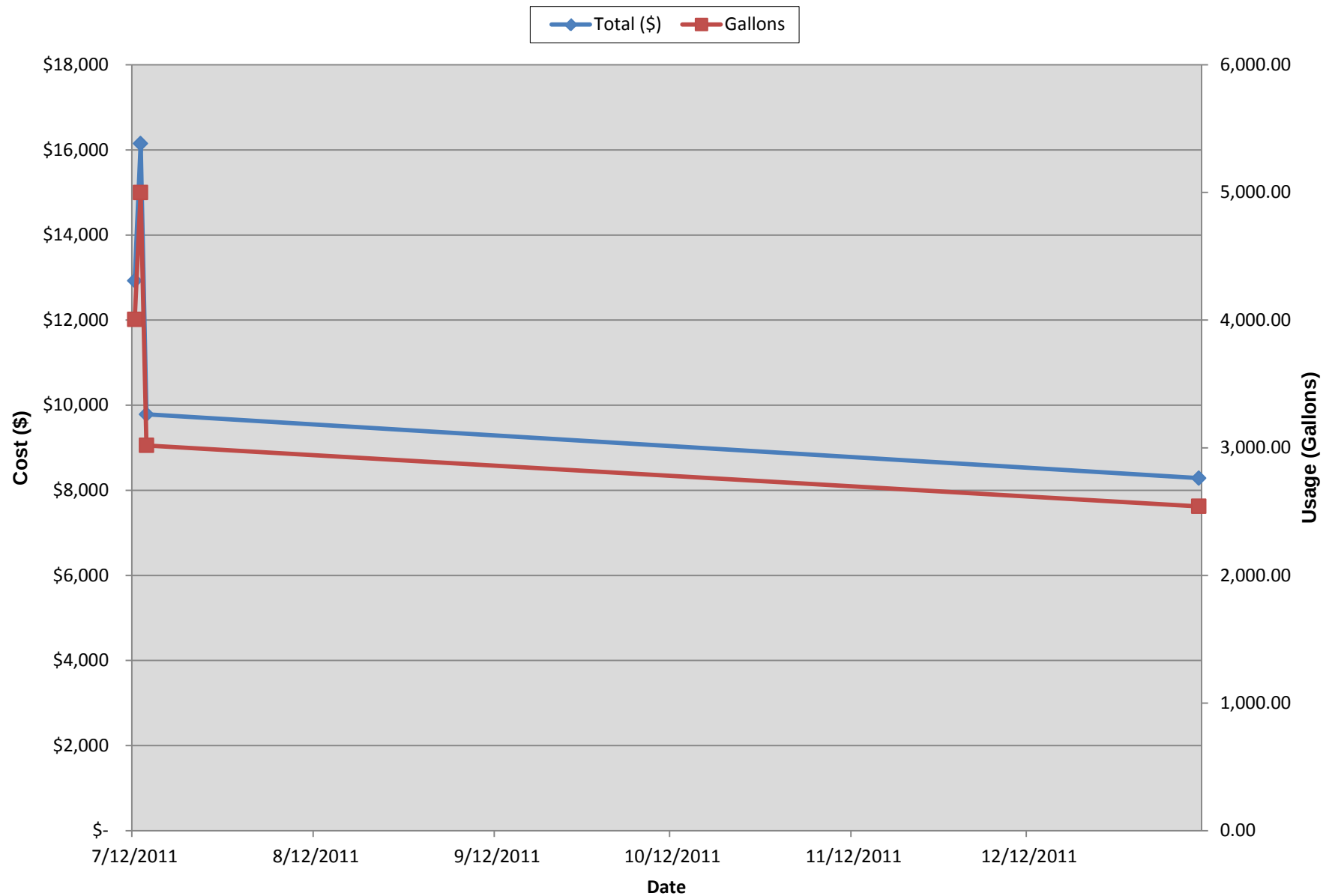


Frenchtown BOE
902 Harrison St, Frenchtown, NJ 08825

For Service at: Edith Ort Thomas Elementary School
Account No.: 433262
Fuel Oil Service
Delivery - Allied Oil LLC
Supplier - Allied Oil LLC

Month	Total (\$)	Gallons	\$/Gallon
7/12/2011	\$ 12,924.38	4,005.20	\$ 3.23
7/13/2011	\$ 16,152.00	5,000.00	\$ 3.23
7/14/2011	\$ 9,784.38	3,018.10	\$ 3.24
1/10/2012	\$ 8,286.27	2,541.10	\$ 3.26
Total	\$ 47,147.03	14,564.40	\$ 3.24

Fuel Oil #2 Usage - Elementary School



Frenchtown BOE
902 Harrison St, Frenchtown, NJ 08825

For Service at: Edith Ort Thomas Elementary School

Account No.: 18-1072297-3

Water

Delivery - New Jersey American Water

Supplier - New Jersey American Water

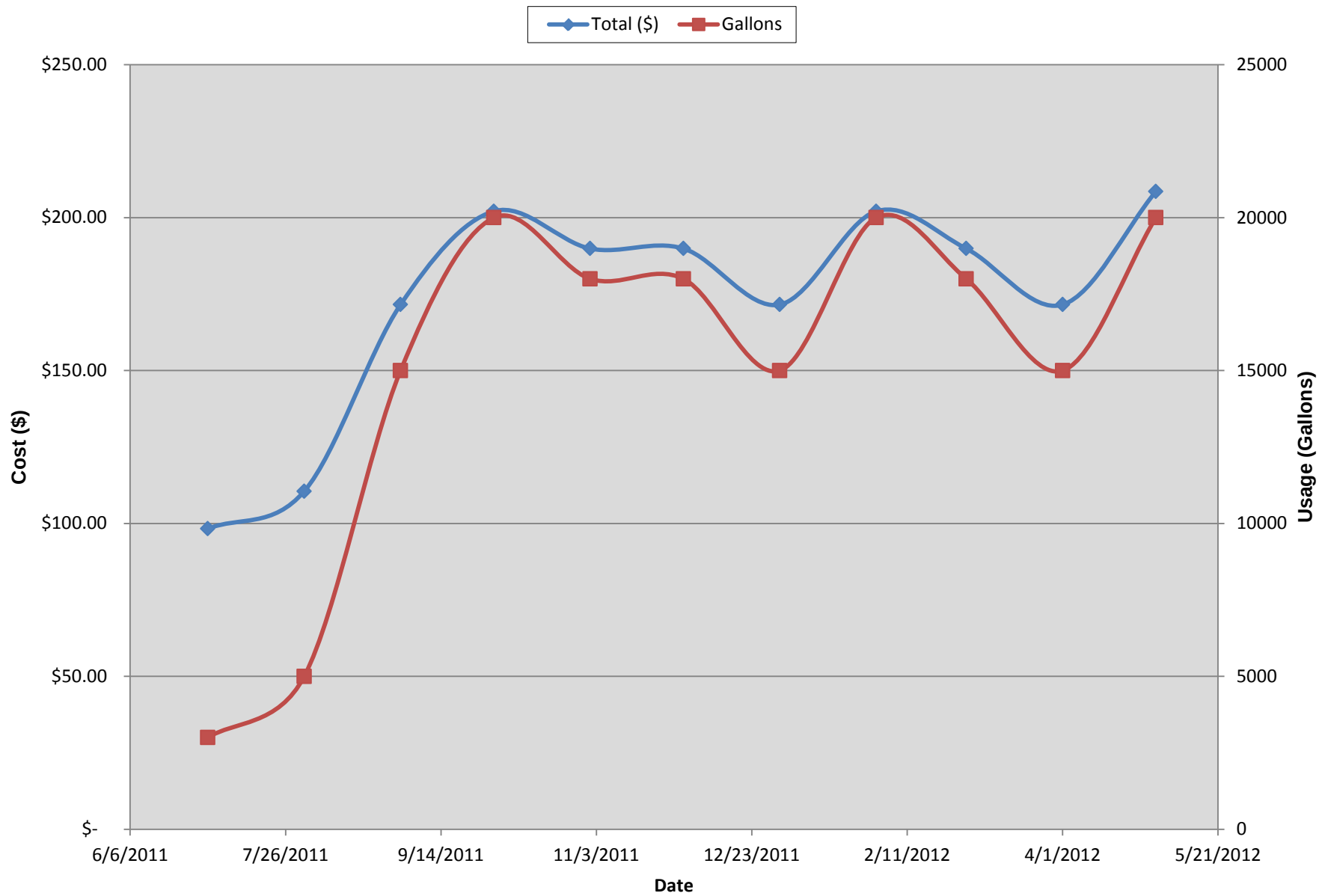
Month	Total (\$)	Gallons	\$/Gallon
7/1/2011	\$ 98.32	3000	\$ 0.033
8/1/2011	\$ 110.53	5000	\$ 0.022
9/1/2011	\$ 171.57	15000	\$ 0.011
10/1/2011	\$ 202.09	20000	\$ 0.010
11/1/2011	\$ 189.89	18000	\$ 0.011
12/1/2011	\$ 189.89	18000	\$ 0.011
1/1/2012	\$ 171.57	15000	\$ 0.011
2/1/2012	\$ 202.09	20000	\$ 0.010
3/1/2012	\$ 189.89	18000	\$ 0.011
4/1/2012	\$ 171.57	15000	\$ 0.011
5/1/2012	\$ 208.57	20000	\$ 0.010
Total	\$ 1,905.98	167000	\$ 0.011

Sewer

Month	Total (\$)	Gallons	\$/Gallon
8/10/2011	\$ 960.00	fixed	
10/25/2011	\$ 960.00	fixed	
1/31/2012	\$ 960.00	fixed	
4/24/2012	\$ 960.00	fixed	
Total	\$ 3,840.00	167000	\$ 0.023

Combined Sewer and Water: \$ 0.034 per gallon

Water Usage - Elementary School



Frenchtown BOE
902 Harrison St, Frenchtown, NJ 08825

For Service at: Edith Ort Thomas Elementary School
LPG Service

FY	LPG	\$	Unit \$
10-11	255	\$753	\$2.95

JCP&L SERVICE TERRITORY
Last Updated: 07/25/12

***CUSTOMER CLASS - R – RESIDENTIAL C – COMMERCIAL I –INDUSTRIAL**

Supplier	Telephone & Web Site	*Customer Class
Alpha Gas and Electric, LLC 641 5 th Street Lakewood, NJ 08701	(855) 553-6374 www.alphagasandelectric.com	R/C ACTIVE
Ambit Northeast, LLC 103 Carnegie Center Suite 300 Princeton, NJ 08540	(877) 30-AMBIT (877) 302-6248 www.ambitenergy.com	R/C ACTIVE
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	(201) 384-5552	R/C/I ACTIVE
BBPC, LLC d/b/a Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	888-651-4121 www.greateasternenergy.com	C/I ACTIVE
BlueStar Energy Solutions 309 Fellowship Road, Fl. 2 Mount Laurel, NJ 08054	(866) 258-3782 (BLUESTAR) www.bluestarenergy.com	C/I ACTIVE
Champion Energy Services, LLC 72 Avenue L Newark, NJ 07105	(877) 653-5090 www.championenergyservices.com	R/C/I ACTIVE
Clearview Electric, Inc. 505 Park Drive Woodbury, NJ 08096	(888) CLR-VIEW (800) 746-4702 www.clearviewenergy.com	R/C/I ACTIVE
ConEdison Solutions Cherry Tree Corporate Center 535 State Highway Suite 180 Cherry Hill, NJ 08002	(888) 665-0955 www.conedsolutions.com	C/I ACTIVE
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(866) 237-7693 www.constellation.com	R/C/I ACTIVE

Constellation Energy 900A Lake Street, Suite 2 Ramsey, NJ 07446	(877) 997-9995 www.constellation.com	R ACTIVE
Direct Energy Business, LLC 120 Wood Avenue Suite 611 Iselin, NJ 08830	(888) 925-9115 www.directenergybusiness.com	C/I ACTIVE
Direct Energy Services, LLC 120 Wood Avenue Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com	C/I ACTIVE
Discount Energy Group, LLC 811 Church Road, Suite 149 Cherry Hill, NJ 08002	(800) 282-3331 www.discountenergygroup.com	R/C ACTIVE
Dominion Retail, Inc. d/b/a Dominion Energy Solutions 395 Route 70 West, Suite 125 Lakewood, NJ 08701	(866) 275-4240 www.dom.com/products	R/C ACTIVE
DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102	877-332-2450 www.dtesupply.com	C/I ACTIVE
Energy Plus Holdings LLC 309 Fellowship Road East Gate Center, Suite 200 Mt. Laurel, NJ 08054	(877) 866-9193 www.energypluscompany.com	R/C ACTIVE
Exelon Energy Company 116 Village Blvd., Suite 200 Princeton, NJ 08540	1-800-261-4301 www.exelonenergy.com	C/I ACTIVE
FirstEnergy Solutions Corp. 300 Madison Avenue Morristown, NJ 07962	(800) 977-0500 www.fes.com	C/I ACTIVE
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	(800) 805-8586 www.gesc.com	R/C/I ACTIVE

GDF SUEZ Energy Resources NA, Inc. 333 Thornall Street Sixth Floor Edison, NJ 08819	(866) 999-8374 www.gdfsuezenergyresources.com	C/I ACTIVE
Glacial Energy of New Jersey, Inc. 75 Route 15 Building E Lafayette, NJ 07848	(888) 452-2425 www.glacialenergy.com	C/I ACTIVE
Green Mountain Energy Company 211 Carnegie Center Drive Princeton, NJ 08540	(866) 767-5818 www.greenmountain.com/commercial-home	C/I ACTIVE
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com	C/I ACTIVE
HOP Energy, LLC d/b/a Metro Energy, HOP Fleet Fueling, HOP Energy Fleet Fueling 1011 Hudson Avenue Ridgefield, NJ 07657	(877) 390-7155 www.hopenenergy.com	R/C/I ACTIVE
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	(973) 438-4380 www.idtenergy.com	R/C ACTIVE
Independence Energy Group, LLC 211 Carnegie Center Princeton, NJ 08540	(877) 235-6708 www.chooseindependence.com	R/C ACTIVE
Integrus Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integrusenergy.com	C/I ACTIVE
Liberty Power Delaware, LLC 3000 Atrium Way Suite 273 Mt. Laurel, NJ 08054	(866) 769-3799 www.libertypowercorp.com	R/C/I ACTIVE

Liberty Power Holdings, LLC 3000 Atrium Way Suite 273 Mt. Laurel, NJ 08054	(866) 769-3799 www.libertypowercorp.com	R/C/I ACTIVE
Linde Energy Services 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.linde.com	C/I ACTIVE
NATGASCO, Inc. 532 Freeman St. Orange, NJ 07050	(973) 678-1800 x. 251 www.supremeenergyinc.com	R/C ACTIVE
NextEra Energy Services New Jersey, LLC 651 Jernee Mill Road Sayreville, NJ 08872	(877) 528-2890 Commercial (800) 882-1276 Residential www.nexteraenergyservices.com	R/C/I ACTIVE
NJ Gas & Electric 1 Bridge Plaza fl.2 Fort Lee, NJ 07024	(866) 568-0290 www.NJGandE.com	R/C/I ACTIVE
Noble Americas Energy Solutions The Mac-Cali Building 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.noblesolutions.com	C/I ACTIVE
North American Power and Gas, LLC 222 Ridgedale Ave. Cedar Knolls, NJ 07927	(888) 313-9086 www.napower.com	R/C/I ACTIVE
Palmco Power NJ, LLC One Greentree Centre 10000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	(877) 726-5862 www.PalmcoEnergy.com	C/I ACTIVE
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) ENERGY-9 (363-7499) www.pepco-services.com	R/C ACTIVE

Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	(855) 32-POWER (76937) www.plymouthenergy.com	R/C/I ACTIVE
PPL EnergyPlus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com	C/I ACTIVE
Public Power & Utility of New Jersey, LLC 39 Old Ridgebury Rd. Suite 14 Danbury, CT 06810	(888) 354-4415 www.ppandu.com	R/C/I ACTIVE
Reliant Energy 211 Carnegie Center Princeton, NJ 08540	(877) 297-3795 (877) 297-3780 www.reliant.com/pjm	R/C/I ACTIVE
ResCom Energy LLC 18C Wave Crest Ave. Winfield Park, NJ 07036	(888) 238-4041 http://rescomenergy.com	R/C ACTIVE
Respond Power LLC 10 Regency CT Lakewood, NJ 08701	(877) 973-7763 www.respondpower.com	R/C/I ACTIVE
South Jersey Energy Company 1 South Jersey Plaza Route 54 Folsom, NJ 08037	(800) 800-266-6020 www.southjerseyenergy.com	C/I ACTIVE
Sperian Energy Corp. 1200 Route 22 East, Suite 2000 Bridgewater, NJ 08807	(888) 682-8082	R/C/I ACTIVE
Starion Energy PA Inc. 101 Warburton Avenue Hawthorne, NJ 07506	(800) 600-3040 www.starionenergy.com	R/C/I ACTIVE
Stream Energy 309 Fellowship Road Suite 200 Mt. Laurel, NJ 08054	(877) 369-8150 www.streamenergy.net	R ACTIVE
UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(856) 273-9995	C/I

	www.ugienergyservices.com	ACTIVE
Verde Energy USA, Inc. 50 East Palisades Avenue Englewood, NJ 07631	(800) 388-3862 www.lowcostpower.com	R/C/I ACTIVE
Viridian Energy 2001 Route 46 Waterview Plaza Suite 310 Parsippany, NJ 07054	(866) 663-2508 www.viridian.com	R/C/I ACTIVE
Xoom Energy New Jersey, LLC 744 Broad Street Newark, NJ 07102	888-997-8979 www.xoomenergy.com	R/C/I ACTIVE
YEP Energy 89 Headquarters Plaza North #1463 Morristown, NJ 07960	855-363-7736 www.yepenergyNJ.com	R/C/I ACTIVE

APPENDIX B

Equipment Inventory

Renovation/Addtion Date: 2002

[illegible]

Energy Audit of Frenchtown BOE
CHA Project No. 24382
Existing Lighting

Cost of Electricity:

\$0.116	\$/kWh
\$5.08	\$/kW

			EXISTING CONDITIONS									
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	NYSERDA Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Retrofit Control	Annual kWh	
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	Retrofit control device	(kW/space) * (Annual Hours)	Notes
13	CSA Office	Offices	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288	
13	Business Office	Offices	1	S 32 P F 2 (ELE)	F42LL	60	0.06	SW	2400	C-OCC	144	
201	Business Office	Offices	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2400	C-OCC	216	
13	CST Room	Classrooms	1	S 32 P F 2 (ELE)	F42LL	60	0.06	SW	2400	C-OCC	144	
13	Kindergarten	Classrooms	12	S 32 P F 2 (ELE)	F42LL	60	0.72	SW	2400	C-OCC	1,728	
13	Boys Lavatory	Bath Room	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2000		240	
13	Boys Locker	Locker	1	S 32 P F 2 (ELE)	F42LL	60	0.06	SW	2800		168	
13	Wollert	Offices	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288	
13	Nurse	Offices	5	S 32 P F 2 (ELE)	F42LL	60	0.30	SW	2400	C-OCC	720	
7	Nurse	Offices	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.12	SW	2400	C-OCC	288	
18	Resource	Classrooms	7	T 32 R F 4 (ELE)	F44ILL	112	0.78	SW	2400	C-OCC	1,882	
13	Speech	Classrooms	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288	
18	Preschool	Classrooms	16	T 32 R F 4 (ELE)	F44ILL	112	1.79	SW	2400	C-OCC	4,301	
18	Hallway	Hallways	9	T 32 R F 4 (ELE)	F44ILL	112	1.01	SW	2280		2,298	
13	Stairwell	Hallways	6	S 32 P F 2 (ELE)	F42LL	60	0.36	SW	2280		821	
215	Gym	Gymnasium	9	High Bay MH 350	MHPS/SCWA/350/1	400	3.60	SW	2912		10,483	
13	Auditorium	Auditorium	20	S 32 P F 2 (ELE)	F42LL	60	1.20	SW	1000		1,200	
129	Auditorium	Auditorium	16	SP 75 I	I75/1	75	1.20	SW	1000		1,200	
13	Main Office	Offices	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288	
13	2nd Grade	Classrooms	12	S 32 P F 2 (ELE)	F42LL	60	0.72	SW	2400	C-OCC	1,728	
13	1st Grade	Classrooms	12	S 32 P F 2 (ELE)	F42LL	60	0.72	SW	2400	C-OCC	1,728	
13	Girls Lavatory	Bath Room	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2000		240	
13	Girls Locker	Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.18	SW	2800		504	
201	Elevator Hallway	Hallways	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.18	SW	2280		410	
13	Storage	Storage Areas	3	S 32 P F 2 (ELE)	F42LL	60	0.18	SW	1000	C-OCC	180	
13	Kitchen	Cafeteria	4	S 32 P F 2 (ELE)	F42LL	60	0.24	SW	1600		384	
13	Cafeteria	Cafeteria	24	S 32 P F 2 (ELE)	F42LL	60	1.44	SW	1600	C-OCC	2,304	
X4	Hallway	Hallways	12	X 20 W I 2	EI20/2	40	0.48	SW	2280		1,094	
18	Science Lab	Classrooms	15	T 32 R F 4 (ELE)	F44ILL	112	1.68	SW	2400	C-OCC	4,032	
7	2nd Fl Girls Lavatory	Bath Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2000		120	
7	2nd Fl Boys Lavatory	Bath Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2000		120	
13	Art/ French	Classrooms	7	S 32 P F 2 (ELE)	F42LL	60	0.42	SW	2400	C-OCC	1,008	
13	Room 5	Classrooms	12	S 32 P F 2 (ELE)	F42LL	60	0.72	SW	2400	C-OCC	1,728	
13	Room 6	Classrooms	12	S 32 P F 2 (ELE)	F42LL	60	0.72	SW	2400	C-OCC	1,728	
13	Room 7	Classrooms	12	S 32 P F 2 (ELE)	F42LL	60	0.72	SW	2400	C-OCC	1,728	
13	Room 8	Classrooms	12	S 32 P F 2 (ELE)	F42LL	60	0.72	SW	2400	C-OCC	1,728	
13	Room 9	Classrooms	12	S 32 P F 2 (ELE)	F42LL	60	0.72	SW	2400	C-OCC	1,728	
13	Computer Lab	Classrooms	13	S 32 P F 2 (ELE)	F42LL	60	0.78	SW	2400	C-OCC	1,872	
13	Music Room	Classrooms	6	S 32 P F 2 (ELE)	F42LL	60	0.36	SW	2400	C-OCC	864	
201	Bondor	Classrooms	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2400	C-OCC	216	
201	Library	Classrooms	20	T 32 R F 3 (ELE)	F43ILL/2	90	1.80	SW	2400	C-OCC	4,320	
18	Hallway	Hallways	11	T 32 R F 4 (ELE)	F44ILL	112	1.23	SW	2280		2,809	
13	Storage	Storage Areas	3	S 32 P F 2 (ELE)	F42LL	60	0.18	SW	1000	C-OCC	180	
Total			328				26.48				59,738	

APPENDIX C

ECM Calculations

Summary of Energy Conservation Measures							
Energy Conservation Measure		Approx. Costs (\$)	Approx. Savings (\$/year)	Payback (Years) w/o Incentive	Potential Incentive (\$)*	Payback (Years) w/ Incentive	Recommended For Implementation
ECM-1	Boiler Conversion to Natural Gas	60,700	16,800	3.6	0	3.6	
ECM-2	Motors & Drives Upgrades	13,600	5,800	2.3	700	2.2	X
ECM-3	EMS Re-Commissioning	17,800	5,100	3.5	0	3.5	X
ECM-4	Network Controller	1,500	800	1.9	0	1.9	X
ECM-5	Replace Kitchen Electric DHW Heater	400	600	0.7	50	0.0	X
ECM-6	Vending Machine Controller	350	500	0.7	0	0.7	X
ECM-7	Replace Door Seals	1,440	500	2.9	0	2.9	X
ECM-8	Lighting Replacement / Upgrades	7,000	900	7.8	385	7.4	
ECM-9	Install Lighting Controls (Occupancy Sensors)	5,700	5,200	1.1	980	0.9	
ECM-10	Lighting Replacements with Lighting Controls (Occupancy Sensors)	12,700	2,300	5.5	1,365	4.9	X
ECM-11	Install Low-Flow Plumbing	1,498	1,000	1.5	0	1.5	X
0	Solar PV	200,000	15,200	13.2	11,796	7.4	
0	Solar HW (Both tanks)	40,000	4,100	9.8	0	0.0	

Frenchtown Board of Education
CHA Project #24382
Edith Thomas Elementary School

ECM Summary Sheet

ECM-1 Boiler Conversion to Natural Gas

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	# 2 Oil		Nat Gas Therms	Total \$						
\$				\$	\$	\$		\$		
60,700	14,564		-20,200	16,800	0	16,800	4.5	0	3.6	3.6

ECM-2 Motors & Drives Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	# 2 Gallons	Total \$						
\$				\$	\$	\$		\$		
13,600	37,405	0	0	5,800	0	5,800	5.4	700	2.3	2.2

ECM-3 EMS Re-Commissioning

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	# 2 Gallons	Total \$						
\$				\$	\$	\$		\$		
17,800	5,578	0	1,311	5,100	0	5,100	3.3	0	3.5	3.5

ECM-4 Network Controller

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$				\$	\$	\$		\$		
1,500	5,400	0	0	800	0	800	1.8	0	1.9	1.9

ECM-5 Replace Kitchen Electric DHW Heater

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	LPG Gals	Total \$						
\$				\$	\$	\$		\$		
400	9,943	4.5	-270	600	0	600	26.8	50	0.7	0.6

ECM-6 Vending Machine Controller

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$				\$	\$	\$		\$		
350	3,229	0	0	500	0	500	6.1	0	0.7	0.7

ECM-7 Replace Door Seals

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	#2 Oil Gals	Total \$						
\$				\$	\$	\$		\$		
1,440	226	0	135	500	0	500	0.7	0	2.9	2.9

ECM-8 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$				\$	\$	\$		\$		
7,000	6,368	3	0	900	0	900	6.9	385	7.8	7.4

ECM-9 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$				\$	\$	\$		\$		
5,700	33,879	0	0	5,200	0	5,200	12.8	980	1.1	0.9

ECM-10 Lighting Replacements with Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$				\$	\$	\$		\$		
12,700	18,091	3	0	2,300	0	2,300	2.3	1,365	5.5	4.9

ECM-11 Install Low-Flow Plumbing

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	# 2 Oil Gallons	Total \$						
\$				\$	\$	\$		\$		
1,498	0	0	0	1,000	0	1,000	-1.0	0	1.5	1.5

Frenchtown Board of Education

CHA Project #24382

Frenchtown, NJ

Utility Costs		Yearly Usage	MTCDE	Building Area	Annual Utility Cost	
\$ 0.155	\$/kWh blended		0.000420205	35,518	Electric	# 2
\$ 0.116	\$/kWh consumption	214,520	0.000420205		\$33,166	\$47,187
\$ 5.08	\$/kW		0			
\$ 3.24	\$/Gals	14,564	0.00533471	20200.268		
\$ 1.50	\$/ Therm		0.00533471			
\$ 2.95	\$/Gals LPG	255	0.00533471			
\$ 11.00	\$/kGal (Water)					

Mbu/ Sqft 56.87 kWh/ Sqft 6.04

Htg. Load 1953.49

2246.5135

Edith Thomas Elementary School

	Item	Savings							Cost	Simple Payback	MTCDE	Life Expectancy	NJ Smart Start Incentives	Renewable Incentives	Direct Install Eligible (Y/N)	Direct Install Incentives**	Max Incentives	Payback w/ Incentives***	Simple Projected Lifetime Savings						ROI
		kW	kWh	# 2 Oil	Therms	Gal/yr LPG	Water (kgal/year)	\$											kW	kWh	therms	# 2 Oil	Gals/ LPG	\$	
ECM-1	Boiler Conversion to Natural Gas	0.0	0	14,564	-20,200	0		\$ 16,800	\$ 60,700	3.6	69.2	20			N	\$ -	\$ -	3.6	0	0	-404,000	291,300	0	336,000	4.5
ECM-2	Motors & Drives Upgrades	0.0	37,405	0	0	0		\$ 5,800	\$ 13,600	2.3	15.7	15	\$ 700		N	\$ -	\$ 700	2.2	0	561,100	0	0	0	86,700	5.4
ECM-3	EMS Re-Commissioning	0.0	5,578	1,311	0	0		\$ 5,100	\$ 17,800	3.5	9.3	15			N	\$ -	\$ -	3.5	0	83,700	0	19,700	0	76,800	3.3
ECM-4	Network Controller	0.0	5,400					\$ 800	\$ 1,500	1.9	2.3	5			N	\$ -	\$ -	1.9	0	27,000	0	0	0	4,200	1.8
ECM-5	Replace Kitchen Electric DHW Heater	4.5	9,943			-270		\$ 600	\$400	0.7	2.7	20	\$ 50			\$ -	\$ 50	1.9	100	198,900	0	0	-5,400	11,100	26.8
ECM-6	Vending Machine Controller		3,229					\$ 500	\$350	0.7	1.4	5				\$ -	\$ -	0.7	0	16,100	0	0	0	2,500	6.1
ECM-7	Replace Door Seals		226	135				\$ 500	\$ 1,440	2.9	0.8	5				\$ -	\$ -	2.9	0	1,100	0	700	0	2,400	0.7
ECM-8	Lighting Replacement / Upgrades	2.8	6,368	0	0	0		\$ 900	\$7,000	7.8	2.7	15	\$ 385			\$ -	\$ 385	7.4	0	95,500	0	0	0	14,800	1.1
ECM-9	Install Lighting Controls (Occupancy Sensors)	0.0	33,879	0	0	0		\$ 5,200	\$5,700	1.1	14.2	15	\$ 980			\$ -	\$ 980	0.9	0	508,200	0	0	0	78,600	12.8
ECM-10	Lighting Replacements with Lighting Controls (Occupancy Sensors)	2.8	18,091	0	0	0		\$ 2,300	\$ 12,700	5.5	7.6	15	\$ 1,365		N	\$ -	\$ 1,365	4.9	0	271,400	0	0	0	42,000	2.3
ECM-11	Install Low-Flow Plumbing	0.0	0	0	0	0	91	\$ 1,000	\$ 1,498	1.5	0.0	15			N			1.5	0	0	0	0	0	0	(1.0)
	Solar PV		98,303					\$ 15,200	\$ 200,000	13.2	41.3	15		\$ 11,796	N		\$ 11,796	7.4	0	1,474,500	0	0	0	228,000	0.1
	Solar HW (Both tanks)		18980	368				\$ 4,100	\$ 40,000	9.8	9.9	20						2.9	0	379,600	0	7,400	0	82,700	1.1
Total (Does Not Include ECM-7 & ECM-8)		7.3	197,154	16,378	(20,200)	(270)		\$ 33,400	\$ 109,988	3.3		14	\$ 2,115			\$ -	\$ 13,911	2.9	100.0	3,013,400	(404,000)	319,100	(5,400)	\$ 872,400	6.9
Total Measures with Positive ROI		7.3	197,154	16,378	(20,200)	(270)		\$ 32,400	\$ 348,490	10.8		13.75	\$ 2,115				\$ 13,911	10.3	100.0	3,013,400	(404,000)	319,100	(5,400)	\$ 872,400	1.5

ECM-1 Boiler Conversion to Natural Gas

Existing Fuel

#2 Oil ▼

Proposed Fuel

Nat.Gas ▼

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	\$ 3.24	Gals #2	
Proposed Fuel Cost	\$1.50	Therms	Based on Elizabeth Gas GDS Rate
Baseline Fuel Use	14,564	Gals #2	Based on historical utility data
Existing Boiler Plant Efficiency	80%		Estimated or Measured
Baseline Boiler Load	1,616,021	Mbtu/yr	Baseline Fuel Use x Existing Efficiency x 138.7 Mbtu/Gals #2
Baseline Fuel Cost	\$ 47,187		
Proposed Boiler Plant Efficiency	80%		New Boiler Efficiency
Proposed Fuel Use	20,200	Therms	Baseline Boiler Load / Proposed Efficiency / 100 Mbtu/Therms
Proposed Fuel Cost	\$ 30,389		

*Note to engineer: Link savings back to summary sheet in appropriate column.

BOILER REPLACEMENT SAVINGS SUMMARY					
	Electric Demand	Electric Usage	Nat Gas Usage	Maint.	Total Cost
	(kW)	(kWh)	(Therms)	(\$)	(\$)
Savings	0	0	0	\$0	\$16,798

ECM-1 Boiler Conversion to Natural Gas - Cost

Multipliers	
Material:	1.15
Labor:	1.20
Equipment:	1.00

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Gas Conversion Kit	2	EA	\$ 4,000	\$ 2,500	\$ -	\$ 9,200	\$ 6,000	\$ -	\$ 15,200	
Gas Piping	250	LF	\$ 100	\$ -	\$ -	\$ 28,750	\$ -	\$ -	\$ 28,750	
						\$ -	\$ -	\$ -	\$ -	

\$ 43,950	Subtotal
\$6,593	15% Contingency
\$10,109	20% O&P
\$0	
\$ 60,651	Total

ECM-2 Motors & Drives Upgrades
HW Pump

Variable Inputs

Blended Electric Rate	\$0.15
Heating System "On" Point	60
VFD Efficiency	98.5%

ECM Description Summary

Larger motors that operate pumps unnecessarily consume electrical energy. The hot water system pumps operate at a constant speed even though the building load does not require all of the flow to maintain temperatures. By adding speed controllers to the motors, called Variable Frequency Drives (VFD's), and reducing the flow (by slowing the motors down), significant electrical energy can be saved. Pressure actuated controllers are used to measure the water pressure in the hto water system and as valves close, the system pressure increases and in turn the pump speed is reduced.

PUMP SCHEDULE							
Pump ID	Qty	HP	Total HP	Existing Motor Motor Eff.	New Motor Motor Eff.	Exist. Motor kW Note 1	New Motor kW Note 2
P-1, P-2	2	5.0	10.0	87.5%	93.6%	6.82	6.38
					Total:	6.82	6.38

SAVINGS ANALYSIS									
OAT - DB Avg Temp F	OAT - WB Avg Temp F	Annual Hours in Bin	Heating Hours Bin	Pump Load %	Existing Pump kWh	Proposed Pump kW	Speed efficiency %	Proposed Pump kWh	Proposed Savings kWh
(A)	(B)	(C)	(D) =IF(A>TP,0,C)	(E) =0.5+0.5*(50-A)/(50-10)) See Note 4	(F) =D*AA	(G) =BB*E^2.5/CC See Note 5	(H)	(I) =D*G	(J) =F-H
See Note 3	See Note 3	See Note 3							
97.5	75	3	0	0%	0	0.0	0.0%	0	0
92.5	74	34	0	0%	0	0.0	0.0%	0	0
87.5	72	131	0	0%	0	0.0	0.0%	0	0
82.5	69	500	0	0%	0	0.0	0.0%	0	0
77.5	67	620	0	0%	0	0.0	0.0%	0	0
72.5	64	664	0	0%	0	0.0	0.0%	0	0
67.5	62	854	0	0%	0	0.0	0.0%	0	0
62.5	58	927	0	0%	0	0.0	0.0%	0	0
57.5	53	600	600	43%	4,092	0.8	73.4%	623	3,469
52.5	47	610	610	53%	4,161	1.3	84.1%	950	3,211
47.5	43	611	611	58%	4,167	1.7	88.8%	1,157	3,010
42.5	38	656	656	64%	4,474	2.1	92.7%	1,494	2,980
37.5	34	1,023	1,023	69%	6,977	2.6	95.9%	2,776	4,201
32.5	30	734	734	75%	5,006	3.2	98.2%	2,357	2,649
27.5	25	334	334	81%	2,278	3.8	99.8%	1,262	1,016
22.5	20	252	252	86%	1,719	4.5	100.0%	1,122	596
17.5	16	125	125	92%	853	5.2	100.0%	651	202
12.5	11	47	47	97%	321	6.0	99.7%	284	36
7.5	6	22	22	100%	150	6.5	99.0%	144	6
2.5	2	13	13	100%	89	6.5	99.0%	85	4
-2.5	-3	0	0	0%	0	0.0	0.0%	0	0
-7.5	-8	0	0	0%	0	0.0	0.0%	0	0
		8,760	5,027		34,287			12,906	21,381

Notes:

- 1) Existing motor power based on operation with existing motor efficiency, operating at 80% load factor when at full load. Formula: Motor HP x 0.746 x 0.8 / Exist. Motor Eff., New motor power is based on same formula using the new motor efficiency.
- 2) New motor power is the same as existing motor power adjusted for the new efficiency, if a new motor is proposed.
- 3) Weather data from NOAA for Newark, New Jersey.
- 4) The pump load is estimated at 100% at X deg. OAT and 50% at X deg. OAT and varies linearly in between.
- 5) The required VFD motor draw is based on a 2.5 power relationship to load.

ECM-2 Motors & Drives Upgrades
CHW Pump

Variable Inputs

Blended Electric Rate	\$0.15
Cooling System "On" Point	60
VFD Efficiency	98.5%

ECM Description Summary

Larger motors that operate pumps unnecessarily consume electrical energy. The chilled water system pumps operate at a constant speed even though the building load does not require all of the flow to maintain temperatures. By adding speed controllers to the motors, called Variable Frequency Drives (VFD's), and reducing the flow (by slowing the motors down), significant electrical energy can be saved. Pressure actuated controllers are used to measure the water pressure in the hto water system and as valves close, the system pressure increases and in turn the pump speed is reduced. In addition, only one pump will operate rather than two which is the current practice.

PUMP SCHEDULE							
Pump ID	Qty	HP	Total HP	Existing Motor Motor Eff.	New Motor Motor Eff.	Exist. Motor kW Note 1	New Motor kW Note 2
P#1,#2	2	5.0	10.0	86.5%	91.0%	6.90	6.56
					Total:	6.90	6.56

SAVINGS ANALYSIS									
OAT - DB Avg Temp F	OAT - WB Avg Temp F	Annual Hours in Bin	Heating Hours Bin	Pump Load %	Existing Pump kWh	Proposed Pump kW	Speed efficiency %	Proposed Pump kWh	Proposed Savings kWh
(A)	(B)	(C)	(D) =IF(A>TP,0,C)	(E) =0.5+0.5*(50-A)/(50-10)) See Note 4	(F) =D*AA	(G) =BB*E^2.5/CC See Note 5	(H)	(I) =D*G	(J) =F-H
See Note 3	See Note 3	See Note 3							
97.5	75	3	3	100%	21	6.7	99.0%	20	1
92.5	74	34	34	94%	235	5.7	100.0%	194	41
87.5	72	131	131	87%	904	4.7	100.0%	619	285
82.5	69	500	500	80%	3,450	3.9	99.7%	1,935	1,514
77.5	67	620	620	74%	4,278	3.1	97.7%	1,967	2,311
72.5	64	664	664	67%	4,581	2.4	94.5%	1,712	2,870
67.5	62	854	854	60%	5,892	1.9	90.2%	1,768	4,124
62.5	58	927	927	53%	6,396	1.4	84.7%	1,517	4,878
57.5	53	600	0	0%	0	0.0	0.0%	0	0
52.5	47	610	0	0%	0	0.0	0.0%	0	0
47.5	43	611	0	0%	0	0.0	0.0%	0	0
42.5	38	656	0	0%	0	0.0	0.0%	0	0
37.5	34	1,023	0	0%	0	0.0	0.0%	0	0
32.5	30	734	0	0%	0	0.0	0.0%	0	0
27.5	25	334	0	0%	0	0.0	0.0%	0	0
22.5	20	252	0	0%	0	0.0	0.0%	0	0
17.5	16	125	0	0%	0	0.0	0.0%	0	0
12.5	11	47	0	0%	0	0.0	0.0%	0	0
7.5	6	22	0	0%	0	0.0	0.0%	0	0
2.5	2	13	0	0%	0	0.0	0.0%	0	0
-2.5	-3	0	0	0%	0	0.0	0.0%	0	0
-7.5	-8	0	0	0%	0	0.0	0.0%	0	0
		8,760	3,733		25,756			9,732	16,024

Notes:

- Existing motor power based on operation with existing motor efficiency, operating at 80% load factor when at full load. Formula: Motor HP x 0.746 x 0.8 / Exist. Motor Eff.,
New motor power is based on same formula using the new motor efficiency.
- New motor power is the same as existing motor power adjusted for the new efficiency, if a new motor is proposed.
- Weather data from NOAA for Newark, New Jersey.
- The pump load is estimated at 100% at X deg. OAT and 50% at X deg. OAT and varies linearly in between.
- The required VFD motor draw is based on a 2.5 power relationship to load.

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

ECM-2 Motors & Drives Upgrades - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						\$ -	\$ -	\$ -	\$ -	
5 HP VFD	2	ea	\$ 1,706	\$ 431		\$ 3,753	\$ 1,164	\$ -	\$ 4,917	
5 HP Motor	2	ea	\$ 373	\$ 79		\$ 821	\$ 213	\$ -	\$ 1,034	
Reprogram DDC system	1	ea	\$ 100	\$ 1,000		\$ 110	\$ 1,350	\$ -	\$ 1,460	
Electrical - misc.	1	ls	\$ 200	\$ 500		\$ 220	\$ 675	\$ -	\$ 895	
Pipe pressure sensor/transmitter	1	ea	\$ 850	\$ 500		\$ 935	\$ 675	\$ -	\$ 1,610	
Misc. piping modification	1	ea	\$ 200	\$ 150		\$ 220	\$ 203	\$ -	\$ 423	
						\$ -	\$ -	\$ -	\$ -	

\$ 10,338	Subtotal
\$ 1,034	10% Contingency
\$ 2,274	20% Contractor O&P
\$ -	0% Engineering
\$ 13,647	Total

ECM-3 EMS Re-Commissioning

ECM Description Summary

The HVAC Building Automation System (BAS) controls consists of an outdated BAS for monitoring and sequencing all HVAC systems and equipment. Due to BAS condition and software, HVAC system sequencing, monitoring, scheduling and monitoring are limited. To reduce the energy used by HVAC systems, the BAS system requires complete re-commissioning, Testing and Balancing of all HVAC systems.

This cost analysis provides simple payback time period by reducing HVAC system energy consumption during unoccupied hours.

35,518 Sq Footage

EXISTING CONDITIONS		
Existing Facility Total Electric usage	214,520	kWh
Existing Facility Total Gas usage	14,564	# 2 Gals
Existing Facility Cooling Electric usage	55,775	kWh ¹
Existing Facility Heating Natural Gas usage	13107.6	# 2 Gals
PROPOSED CONDITIONS		
Proposed Facility Cooling Electric Savings	5,578	kWh
Proposed Facility Natural Gas Savings	1,311	#2 Gals
SAVINGS		
Retro-Commissioning Electric Savings	5,578	kWh
Retro-Commissioning Natural Gas Savings	1,311	# 2 Gals
Total cost savings	\$ 5,100	
Estimated Total Project Cost	\$ 17,759	⁴
Simple Payback	3.5	years

Assumptions

- 1 26% of facility total electricity dedicated to Cooling; Source: E source, data from U.S. Energy Information Administration
- 2 90% of facility total natural gas dedicated to Heating; Source: E source, data from U.S. Energy Information Administration
- 3 10% Typical Savings associated with Retro-Commissioning of controls based on previous project experience
- 4 Based on \$0.50 / Sq Ft recommissioning cost

Network Controller Savings Calculations

Notes:

- 1. Savings are for the installation of a centralized computer management system installed on the client server that will centralize the power management functions that are native to the Windows environment.
- 2. Energy savings per computer are based on historical information from previous installations encompassing tens of thousands of computers.
- 3. There are approximately 45 computers in all

Background Data	
Average Consumption and Savings Figures	kWh
Average Total Consumption per PC per Year	500-700
Average Energy and Cost Waste per PC per Year	350-450
Average savings transparantly available via Surveyor	120

Number of PCs	45
Return on Investment Analysis	
Annual Energy Savings	kWh 5,400

ECM-4 Network Controller - Cost

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						\$ -	\$ -	\$ -	\$ -	
Network Controller	45	EA	\$ 8	\$ -		\$ 371	\$ -	\$ -	\$ 371	
IT Deployment	1	EA	\$ -	\$ 600		\$ -	\$ 810	\$ -	\$ 810	
						\$ -	\$ -	\$ -	\$ -	

\$ 1,181	Subtotal
\$ 118	10% Contingency
\$ 236	20% Contractor O&P
\$ -	0% Engineering
\$ 1,536	Total

ECM-5 Replace Kitchen Electric DHW Heater

Summary

* Replace Electric DHW Heater with Tankless Condensing Propane-Fired DHW Heater

Item	Value	Units	Formula/Comments
Occupied days per week	5	days/wk	
Water supply Temperature	60	°F	Temperature of water coming into building
Hot Water Temperature	140	°F	
Hot Water Usage per day	137	gal/day	Calculated from usage below
Annual Hot Water Energy Demand	23,716	MBTU/yr	Energy required to heat annual quantity of hot water to setpoint
Existing Tank Size	40	Gallons	Per manufacturer nameplate
Hot Water Temperature	140	°F	Per building personnel
Average Room Temperature		°F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	1.2	MBH	
Annual Standby Hot Water Load	10,220	MBTU/yr	
Total Annual Hot Water Demand (w/ standby losses)	33,936	Mbtu/yr	Building demand plus standby losses
Existing Water Heater Efficiency	100%		Per Manufacturer
Total Annual Energy Required	33,936	Mbtu/yr	
Total Annual Electric Required	9,943	kWh/yr	Electrical Savings
Average Annual Electric Demand	1.14	kW	
Peak Electric Demand	4.50	kW	Per Manufacturer's Nameplate (Demand Savings)
New Tank Size	0	Gallons	tankless
Hot Water Temperature	140	°F	
Average Room Temperature	0	°F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.0	MBH	
Annual Standby Hot Water Load	0	MBTU/yr	
Prop Annual Hot Water Demand (w/ standby losses)	23,716	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		Based on Rinnai RU80E Condensing DHW Heater
Proposed Total Annual Energy Required	24,704	MBTU/yr	
Proposed Fuel Use	270	Gals/yr	Standby Losses and inefficient DHW heater eliminated
Elec Utility Demand Unit Cost	\$5.08	\$/kW	
Elec Utility Supply Unit Cost	\$0.12	\$/kWh	
Propane Utility Unit Cost	\$2.95	\$/Gals	
Existing Operating Cost of DHW	\$1,430	\$/yr	
Proposed Operating Cost of DHW	\$796	\$/yr	
Annual Utility Cost Savings	\$634	\$/yr	

Daily Hot Water Demand

FIXTURE	*BASE WATER USE GPM	DURATION OF USE (MIN)	#USES PER DAY		FULL TIME OCCUPANTS**		TOTAL GAL/DAY	% HOT WATER	TOTAL HW GAL/DAY
			MALE	FEMALE	MALE	FEMALE			
LAVATORY (Low-Flow Lavs use 0.5 GPM)	2.5	0.25	3	3	0	0	0	50%	0
SHOWER	2.5	5	1	1	0	0	0	75%	0
KITCHEN SINK	2.5	0.5	1	1	10	0	13	75%	9
MOP SINK	2.5	2	1	1	10		50	75%	38
Dishwasher (gal per use)	1.5	60	0	0	0	0	90	100%	90
						TOTAL	63		137

Multipliers		
Material:	1.15	
Labor:	1.25	
Equipment:	1.15	

ECM-5 Replace Kitchen Electric DHW Heater - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Venting	1	LS	\$ 250	\$ 1,200		\$ 288	\$ 1,500	\$ -	\$ 1,788	
Tankless DHW Heater	1	LS	\$ 1,200	\$ 300		\$ 1,380	\$ 375	\$ -	\$ 1,755	
Demo of Existing	1	LS		\$ 1,200		\$ -	\$ 1,500	\$ -	\$ 1,500	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	

\$ 5,043	Subtotal
\$ -	
\$ -	
\$ -	
\$ 5,043	Total

Cold Drink and Snack Vending Machine Energy Conservation Project

Energy Analysis Prepared For:	Input Variables	
	Energy Costs (\$0.000 per kwh)	\$0.155
	Facility Occupied Hours per Week	60
	Number of Cold Drink Vending Machines	2
	Number of Uncooled Snack Machines	0
	Power Requirements of Cold Drink Machine (avg watts)	345
	Power Requirements of Snack Machine (avg watts)	150
	VendingMiser Sale Price (for cold drink machines)	\$175.00
	SnackMiser Sale Price (for snack machines)	\$160.00

Savings Analysis

	Before	After	
Cold Drink Machines	\$935.14	\$435.89	Cost of Operation
	6,049	2,819	kWh
		53%	% Energy Savings

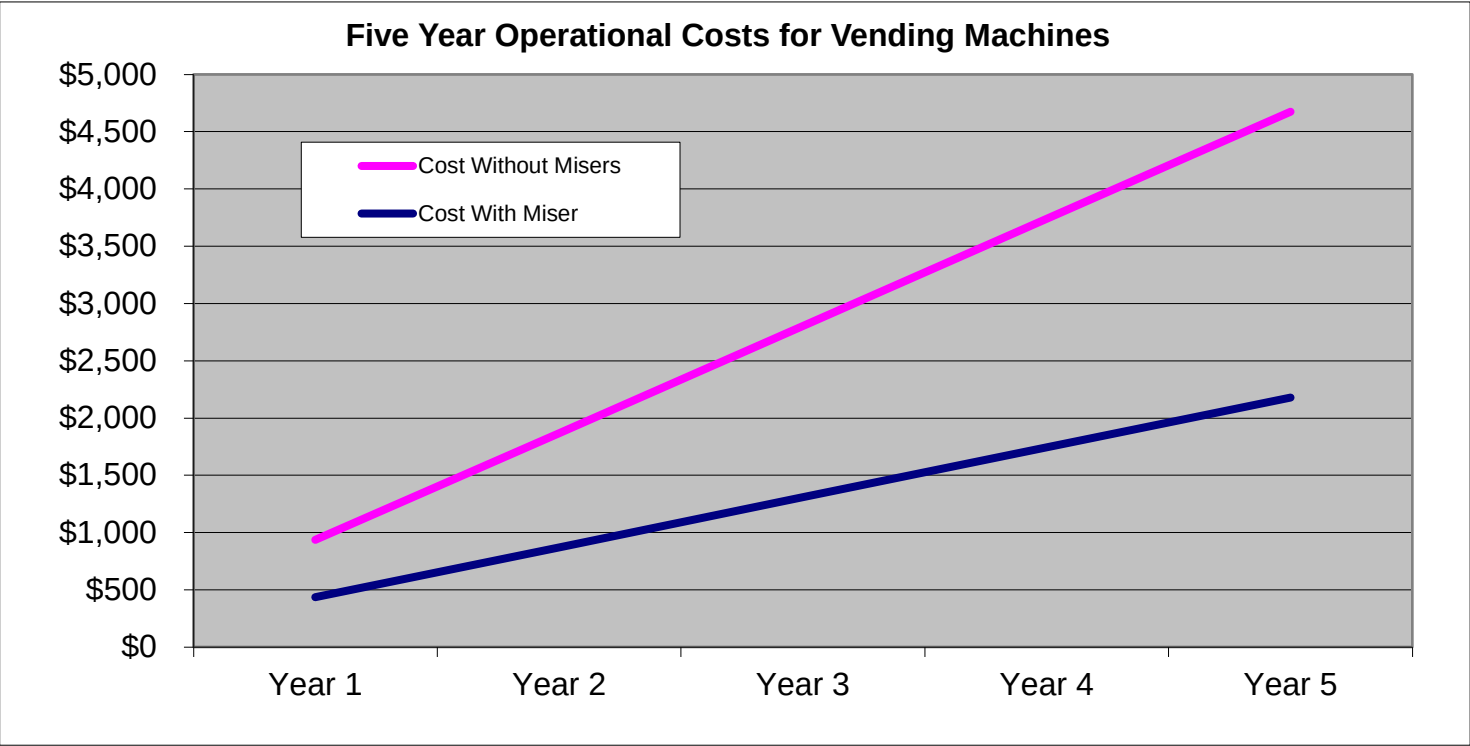
Snack Machines	\$0.00	\$0.00	Cost of Operation
	0	0	kWh
		0%	% Energy Savings

Project Summary

Present kWh	Projected kWh	kWh Savings per Year
6,049	2,819	3,229

Present Cost	Projected Costs	Annual Savings	Per Cent Savings	Total Project Cost	Break Even (Months)
\$935.14	\$435.89	\$499.25	53%	\$350.00	8.4

Five Year Savings on 2 Machines = \$2,496.26
Five Year Return on Investment = 613%



Version 1.0

Source Data for Generating Chart					
	Year 1	Year 2	Year 3	Year 4	Year 5
Cost With Miser	\$435.89	\$871.77	\$1,307.66	\$1,743.54	\$2,179.43
Cost Without Misers	\$935.14	\$1,870.28	\$2,805.41	\$3,740.55	\$4,675.69
Total Number of machine	2				

ECM-7 Replace Door Seals

Existing: Lack of door seals result in excessive heat loss and infiltration
Proposed: Install door seals and/or weather-stripping to reduce air infiltration

Heating System Efficiency	86%	Ex Occupied Cing Temp.	73 °F	Ex Occupied Htg Temp.	70 °F
Cooling System Efficiency	1.20 kW/ton	Ex Unoccupied Cing Temp.	77 °F	Ex Unoccupied Htg Temp.	66 °F
Linear Feet of Door Edge	104	Cooling Occ Enthalpy Setpoint	27.5 Btu/lb	Electricity	\$ 0.15 \$/kWh
Existing Infiltration Factor*	1.5 cfm/LF	Cooling Unocc Enthalpy Setpoint	27.5 Btu/lb	Natural Gas	\$ 3.24 \$/Gals # 2
Proposed Infiltration Factor*	0.45 cfm/LF				

*Infiltration Factor per Carrier Handbook of Air Conditioning System Design
based on average door seal gap calculated below.

					EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
					Occupied	Unoccupied	Occupied	Unoccupied				
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy Gals	Proposed Heating Energy Gals
A		B	C	D	E	F	G	H	I	J	K	L
97.0	38.3	19	11	8	-7,582	-7,582	-2,274	-2,274	14	4	0	0
92.0	36.5	77	43	34	-6,318	-6,318	-1,895	-1,895	49	15	0	0
87.0	34.7	196	103	94	-5,054	-5,054	-1,516	-1,516	99	30	0	0
82.0	32.2	379	171	207	-3,299	-3,299	-990	-990	125	37	0	0
77.0	29.9	609	209	400	-1,685	0	-505	0	35	11	0	0
72.0	27.7	813	207	606	0	0	0	0	0	0	0	0
67.0	25.7	810	194	616	505	0	152	0	0	0	1	0
62.0	23.8	760	187	573	1,348	674	404	202	0	0	5	2
57.0	22.0	706	172	534	2,190	1,516	657	455	0	0	10	3
52.0	20.3	690	169	521	3,033	2,359	910	708	0	0	15	4
47.0	18.7	688	182	505	3,875	3,201	1,163	960	0	0	20	6
42.0	16.6	767	199	568	4,717	4,044	1,415	1,213	0	0	27	8
37.0	15.2	839	201	639	5,560	4,886	1,668	1,466	0	0	36	11
32.0	13.9	629	140	489	6,402	5,728	1,921	1,718	0	0	31	9
27.0	12.6	366	78	287	7,245	6,571	2,173	1,971	0	0	21	6
22.0	11.3	222	46	176	8,087	7,413	2,426	2,224	0	0	14	4
17.0	10.2	117	23	95	8,929	8,256	2,679	2,477	0	0	8	2
12.0	9.0	51	8	43	9,772	9,098	2,932	2,729	0	0	4	1
7.0	7.9	17	2	15	10,614	9,940	3,184	2,982	0	0	1	0
2.0	6.9	2	0	2	11,457	10,783	3,437	3,235	0	0	0	0
-3.0	5.8	0	0	0	12,299	11,625	3,690	3,488	0	0	0	0
-8.0	4.8	2	1	1	13,141	12,468	3,942	3,740	0	0	0	0
-13.0	3.9	1	0	1	13,984	13,310	4,195	3,993	0	0	0	0
TOTALS		8,760	2,346	6,414					322	97	193	58

Existing Door Infiltration	156 cfm	Savings	135 Gals	\$ 437
Existing Unoccupied Door Infiltration	156 cfm		226 kWh	\$ 35
Proposed Door Infiltration	47 cfm			\$ 472
Proposed Unoccupied Door Infiltration	47 cfm			

Door	Width (ft)	Height (ft)	Linear Feet (LF)	gap (in)	gap location	LF of gap	% door w/ gap	Average gap for door (in)
1	6	7	26	0.125	bottom/seam	0.3	1%	0.001
2	6	7	26	0.125	bottom/seam	0.3	1%	0.001
3	6	7	26	0.125	all sides	0.3	1%	0.001
4	6	7	26	0.125	all sides	0.3	1%	0.001
Total	24	28	104	0.125		1.08	1%	0.001

Note: Doors labeled 'a', 'b', etc. are a part of the same door assembly.

Multipliers	
Material:	1.15
Labor:	1.25
Equipment:	1.15

ECM-7 Replace Door Seals - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									\$ -	
New Door Seal	4	Dbl.Doors	\$ 150	\$ 150	\$ -	\$ 690	\$ 750	\$ -	\$ 1,440	

\$ 1,440	Subtotal
\$ -	
\$ -	
\$ -	
\$ 1,440	Total

Pompton Lakes-Lenox ES - NJBPU
CHA Project #24698

ECM-8: Replace toilets and flush valves with low flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	\$11.00	\$ / kGal
Toilets in Building	13	
Average Flushes / Toilet (per Day)	4	
Average Gallons / Flush	5.5	Gal

PROPOSED CONDITIONS		
Proposed Toilets to be Replaced	13	
Proposed Gallons / Flush	1.3	Gal

SAVINGS		
Current Toilet Water Use	104	kGal / year
Proposed Toilet Water Use	24	kGal / year
Water Savings	80	kGal / year
Cost Savings	\$881	/ year

Pompton Lakes-Lenox ES - NJBPU
CHA Project #24698

ECM-11: Replace Aerators With Low-Flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	\$11.00	\$ / kGal
Aerators in Building	10	
Average Uses / Faucet (per day)	4	Gal
Average Time of Use	0.5	min
Average Flowrate	3.0	gpm

PROPOSED CONDITIONS		
Proposed Faucets to be Replaced	10	
Proposed Flowrate	1.5	gpm

SAVINGS		
Current Faucet Water Use	22	kGal / year
Proposed Faucet Water Use	11	kGal / year
Water Savings	11	kGal / year
Cost Savings	\$120	/ year

Pompton Lakes-Lenox ES - NJBPU
CHA Project #24698

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

ECM 8: Low Flow Plumbing Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						\$ -	\$ -	\$ -	\$ -	
Flush Valves & Toilets	13	EA	\$ 30.0	\$ 20.00	\$ -	\$ 429	\$ 351	\$ -	\$ 780	
Faucets	10	EA	\$ 20	\$ 10	\$ -	\$ 220	\$ 135	\$ -	\$ 355	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	

\$ 1,135	Subtotal
\$ 113.50	10% Contingency
\$ 249.70	20% Contractor O&P
\$ -	
\$ 1,498	Total

Cost of Electricity \$0.155 /kWh
System Capacity 50.0 kW
System Unit Cost \$4,000 /kW

Photovoltaic (PV) Rooftop Solar Power Generation

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	* Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
\$	kW	kWh	therms	\$	\$	\$	\$	\$	Years	Years
\$200,000	0.0	98,303	0	\$15,200	0	\$15,200	\$0	\$11,796	13.2	7.4

** Solar Renewable Energy Certificate Program (SREC) SREC for 2012= \$120/1000kwh

NOTE: COST ESTIMATES ARE +/- 80 %. DO NOT USE FOR PROCURMENT

Solar Thermal Hot Water (Main DHW)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	# 2 Gallons	Total \$						
\$					\$	\$		\$		
20,000	0	0	368	1,288	0	1,288	0.3	0	15.5	15.5

Solar Thermal Hot Water (Kitchen DHW)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	# 2 Gallons	Total \$						
\$					\$	\$		\$		
20,000	18,980	0	0	2,847	0	2,847	1.8	0	7.0	7.0

Frenchtown Board of Education
 CHA Project #24382
 Edith Thomas Elementary School

New Jersey Pay For Performance Incentive Program for Recommended ECM's

Note: The following calculation is based on the New Jersey Pay For Performance Incentive Program per 2012. Building must have a minimum average electric demand of 100 kW. This minimum is waived for buildings owned by local governments or non-profit organizations. Values used in this calculation are for measures with a positive return on investment (ROI) only.

Total Building Area (Square Feet)		35,518
Is this audit funded by NJ BPU (Y/N)		Yes

Board of Public Utilites (BPU)

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	\$33,166	
Existing Usage (from utility)	214,520	
Proposed Savings	79,871	
Existing Total MMBtus	2,771	
Proposed Savings MMBtus	545	
% Energy Reduction	19.7%	
Proposed Annual Savings	\$33,400	

Incentive #1		
Audit not funded by NJ BPU	\$0.10	\$/sqft
Audit is funded by NJ BPU	\$0.05	\$/sqft

	Min (Savings = 15%)		Increase (Savings > 15%)		Max Incentive		Achieved Incentive	
	\$/kWh	\$/therm	\$/kWh	\$/therm	\$/kWh	\$/therm	\$/kWh	\$/therm
Incentive #2	\$0.09	\$0.90	\$0.005	\$0.05	\$0.11	\$1.25	\$0.11	\$1.13
Incentive #3	\$0.09	\$0.90	\$0.005	\$0.05	\$0.11	\$1.25	\$0.11	\$1.13

	Incentives \$		
	Elec	Gas	Total
Incentive #1	\$0	\$0	\$1,776
Incentive #2	\$8,786	\$0	\$8,786
Incentive #3	\$8,786	\$0	\$8,786
Total All Incentives	\$17,572	\$0	\$19,347

Total Project Cost	\$109,988
--------------------	-----------

		Allowable Incentive
% Incentives #1 of Utility Cost*	5.4%	\$1,776
% Incentives #2 of Project Cost**	8.0%	\$8,786
% Incentives #3 of Project Cost**	8.0%	\$8,786
Total Eligible Incentives***	\$19,347	
Project Cost w/ Incentives	\$90,641	

Project Payback (years)	
w/o Incentives	w/ Incentives
3.3	2.7

* Maximum allowable incentive is 50% of annual utility cost if not funded by NJ BPU, and %25 if it is.
 ** Maximum allowable amount of Incentive #2 is 25% of total project cost.
 Maximum allowable amount of Incentive #3 is 25% of total project cost.
 *** Maximum allowable amount of Incentive #1 is \$50,000 if not funded by NJ BPU, and \$25,000 if it is.
 Maximum allowable amount of Incentive #2 & #3 is \$1 million per gas account and \$1 million per electric account

Cost of Electricity: \$0.116 \$/kWh
 \$5.08 \$/kW

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS							
	Area Description	No. of Fixtures	Standard Fixture Code	NYSERDA Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback	
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/Space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/Space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * (\$/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered	
13	CSA Office	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2,400	288	- 0.0	\$ -	\$ -	\$0				
13	Business Office	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2,400	144	- 0.0	\$ -	\$ -	\$0				
201	Business Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2,400	216	- 0.0	\$ -	\$ -	\$0				
13	CST Room	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2,400	144	- 0.0	\$ -	\$ -	\$0				
13	Kindergarten	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2,400	1,728	- 0.0	\$ -	\$ -	\$0				
13	Boys Lavatory	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2000	240	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2,000	240	- 0.0	\$ -	\$ -	\$0				
13	Boys Locker	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2800	168	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2,800	168	- 0.0	\$ -	\$ -	\$0				
13	Wollett	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2,400	288	- 0.0	\$ -	\$ -	\$0				
13	Nurse	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2,400	720	- 0.0	\$ -	\$ -	\$0				
7	Nurse	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	288	2	2T 17 R F 2 (ELE)	F22ILL	33	0.1	SW	2,400	158	130	0.1	\$ 18.33	\$ 202.50	\$20	11.1	1.4	
18	Resource	7	T 32 R F 4 (ELE)	F44ILL	112	0.8	SW	2400	1,882	7	T 32 R F 4 (ELE)	F44ILL	112	0.8	SW	2,400	1,882	- 0.0	\$ -	\$ -	\$0				
13	Speech	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2,400	288	- 0.0	\$ -	\$ -	\$0				
18	Preschool	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,301	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2,400	4,301	- 0.0	\$ -	\$ -	\$0				
18	Hallway	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2280	2,298	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2,280	2,298	- 0.0	\$ -	\$ -	\$0				
13	Stairwell	6	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2280	821	6	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2,280	821	- 0.0	\$ -	\$ -	\$0				
215	Gym	9	High Bay MH 350	MHPS/SCWA/350/1	400	3.6	SW	2912	10,483	9	F48T5HO	F44GHL	234	2.1	SW	2,912	6,133	4,351	1.5	\$ 595.74	\$ 4,781.25	\$225	8.0	1.0	
13	Auditorium	20	S 32 P F 2 (ELE)	F42LL	60	1.2	SW	1000	1,200	20	S 32 P F 2 (ELE)	F42LL	60	1.2	SW	1,000	1,200	- 0.0	\$ -	\$ -	\$0				
129	Auditorium	16	SP 75/1	I75/1	75	1.2	SW	1000	1,200	16	CF 26	CFQ26/1-L	27	0.4	SW	1,000	432	768	0.8	\$ 135.91	\$ 324.00	\$0	2.4	0.4	
13	Main Office	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2,400	288	- 0.0	\$ -	\$ -	\$0				
13	2nd Grade	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2,400	1,728	- 0.0	\$ -	\$ -	\$0				
13	1st Grade	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2,400	1,728	- 0.0	\$ -	\$ -	\$0				
13	Girls Lavatory	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2000	240	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2,000	240	- 0.0	\$ -	\$ -	\$0				
13	Girls Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	2800	504	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	2,800	504	- 0.0	\$ -	\$ -	\$0				
201	Elevator Hallway	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	2280	410	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	2,280	410	- 0.0	\$ -	\$ -	\$0				
13	Storage	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1000	180	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1,000	180	- 0.0	\$ -	\$ -	\$0				
13	Kitchen	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1600	384	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1,600	384	- 0.0	\$ -	\$ -	\$0				
13	Cafeteria	24	S 32 P F 2 (ELE)	F42LL	60	1.4	SW	1600	2,304	24	S 32 P F 2 (ELE)	F42LL	60	1.4	SW	1,600	2,304	- 0.0	\$ -	\$ -	\$0				
X4	Hallway	12	X 20 W 12	E120/2	40	0.5	SW	2280	1,094	12	XX 3.0 W CF 2	ELED1.5/2	3	0.0	SW	2,280	82	1,012	0.4	\$ 144.50	\$ 1,539.00	\$120	10.7	1.4	
18	Science Lab	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	SW	2400	4,032	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	SW	2,400	4,032	- 0.0	\$ -	\$ -	\$0				
7	2nd FI Girls Lavatory	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2000	120	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,000	66	54	0.0	\$ 7.91	\$ 101.25	\$10	12.8	1.7	
7	2nd FI Boys Lavatory	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2000	120	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,000	66	54	0.0	\$ 7.91	\$ 101.25	\$10	12.8	1.7	
13	Art/ French	7	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2400	1,008	7	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2,400	1,008	- 0.0	\$ -	\$ -	\$0				
13	Room 5	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2,400	1,728	- 0.0	\$ -	\$ -	\$0				
13	Room 6	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2,400	1,728	- 0.0	\$ -	\$ -	\$0				
13	Room 7	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2,400	1,728	- 0.0	\$ -	\$ -	\$0				
13	Room 8	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2,400	1,728	- 0.0	\$ -	\$ -	\$0				
13	Room 9	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2,400	1,728	- 0.0	\$ -	\$ -	\$0				
13	Computer Lab	13	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	1,872	13	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2,400	1,872	- 0.0	\$ -	\$ -	\$0				
13	Music Room	6	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2400	864	6	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2,400	864	- 0.0	\$ -	\$ -	\$0				
201	Bondor	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2,400	216	- 0.0	\$ -	\$ -	\$0				
201	Library	20	T 32 R F 3 (ELE)	F43ILL/2	90	1.8	SW	2400	4,320	20	T 32 R F 3 (ELE)	F43ILL/2	90	1.8	SW	2,400	4,320	- 0.0	\$ -	\$ -	\$0				
18	Hallway	11	T 32 R F 4 (ELE)	F44ILL	112	1.2	SW	2280	2,809	11	T 32 R F 4 (ELE)	F44ILL	112	1.2	SW	2,280	2,809	- 0.0	\$ -	\$ -	\$0				
13	Storage	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1000	180	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1,000	180	- 0.0	\$ -	\$ -	\$0				
Total		328				26.5			59,738	328			2,963	23.7			53,370	6,368	2.8	\$910	\$7,049	\$385			
																		Demand Savings			\$172				
																		kWh Savings			6,368	\$739			
																		Total savings			\$910		7.7	7.3	

ECM-9 Install Occupancy Sensors

Cost of Electricity: \$0.116 \$/kWh
\$5.08 \$/kW

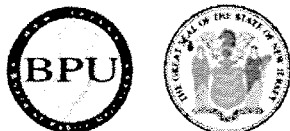
		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	NYSERDA Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2x2 Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fix) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/Space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2x2 Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fix) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/Space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kW Saved) * (\$/kWh)	Cost for renovations to lighting system		Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
13	CSA Office	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OC	1200	144.0	144.0	0.0	\$16.70	\$202.50	\$35.00	12.1	10.0
13	Business Office	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	144.0	1	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OC	1200	72.0	72.0	0.0	\$8.35	\$202.50	\$35.00	24.2	20.1
201	Business Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OC	1200	108.0	108.0	0.0	\$12.53	\$202.50	\$35.00	16.2	13.4
13	CST Room	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	144.0	1	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OC	1680	100.8	43.2	0.0	\$5.01	\$202.50	\$35.00	40.4	33.4
13	Kindergarten	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728.0	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OC	1680	1,209.6	518.4	0.0	\$60.13	\$202.50	\$35.00	3.4	2.8
13	Boys Lavatory	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2000	240.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1		2000		0.0	\$0.00	\$0.00				
13	Boys Locker	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2800	168.0	1	S 32 P F 2 (ELE)	F42LL	60	0.1		2800		0.0	\$0.00	\$0.00				
13	Wollert	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OC	1200	144.0	144.0	0.0	\$16.70	\$202.50	\$35.00	12.1	10.0
13	Nurse	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720.0	5	S 32 P F 2 (ELE)	F42LL	60	0.3	C-OC	1200	360.0	360.0	0.0	\$41.76	\$202.50	\$35.00	4.8	4.0
7	Nurse	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	288.0	2	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OC	1200	144.0	144.0	0.0	\$16.70	\$202.50	\$35.00	12.1	10.0
18	Resource	7	T 32 R F 4 (ELE)	F44ILL	112	0.8	SW	2400	1,881.6	7	T 32 R F 4 (ELE)	F44ILL	112	0.8	C-OC	1680	1,317.1	564.5	0.0	\$65.48	\$202.50	\$35.00	3.1	2.6
13	Speech	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OC	1680	201.6	86.4	0.0	\$10.02	\$202.50	\$35.00	20.2	16.7
18	Preschool	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,300.8	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	C-OC	1680	3,010.6	1,290.2	0.0	\$149.67	\$202.50	\$35.00	1.4	1.1
18	Hallway	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2280	2,298.2	9	T 32 R F 4 (ELE)	F44ILL	112	1.0		2280		0.0	\$0.00	\$0.00				
13	Stairwell	6	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2280	820.8	6	S 32 P F 2 (ELE)	F42LL	60	0.4		2280		0.0	\$0.00	\$0.00				
215	Gym	9	High Bay MH 350	MHPS/SCWA/350/1	400	3.6	SW	2912	10,483.2	9	High Bay MH 350	MHPS/SCWA/350/1	400	3.6		2912		0.0	\$0.00	\$0.00				
13	Auditorium	20	S 32 P F 2 (ELE)	F42LL	60	1.2	SW	1000	1,200.0	20	S 32 P F 2 (ELE)	F42LL	60	1.2		1000		0.0	\$0.00	\$0.00				
129	Auditorium	16	SP 75 I	I75/1	75	1.2	SW	1000	1,200.0	16	SP 75 I	F42LL	60	1.2		1000		0.0	\$0.00	\$0.00				
13	Main Office	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OC	1200	144.0	144.0	0.0	\$16.70	\$202.50	\$35.00	12.1	10.0
13	2nd Grade	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728.0	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OC	1680	1,209.6	518.4	0.0	\$60.13	\$202.50	\$35.00	3.4	2.8
13	1st Grade	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728.0	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OC	1680	1,209.6	518.4	0.0	\$60.13	\$202.50	\$35.00	3.4	2.8
13	Girls Lavatory	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2000	240.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1		2000		0.0	\$0.00	\$0.00				
13	Girls Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	2800	504.0	3	S 32 P F 2 (ELE)	F42LL	60	0.2		2800		0.0	\$0.00	\$0.00				
201	Elevator Hallway	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	2280	410.4	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2		2280		0.0	\$0.00	\$0.00				
13	Storage	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1000	180.0	3	S 32 P F 2 (ELE)	F42LL	60	0.2	C-OC	250	45.0	135.0	0.0	\$15.66	\$202.50	\$35.00	12.9	10.7
13	Kitchen	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1600	384.0	4	S 32 P F 2 (ELE)	F42LL	60	0.2		1600		0.0	\$0.00	\$0.00				
13	Cafeteria	24	S 32 P F 2 (ELE)	F42LL	60	1.4	SW	1600	2,304.0	24	S 32 P F 2 (ELE)	F42LL	60	1.4	C-OC	1200	1,728.0	576.0	0.0	\$66.82	\$202.50	\$35.00	3.0	2.5
X4	Hallway	12	X 20 W 1 2	E120/2	40	0.5	SW	2280	1,094.4	12	X 20 W 1 2	E120/2	40	0.5		2280		0.0	\$0.00	\$0.00				
18	Science Lab	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	SW	2400	4,032.0	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	C-OC	1680	2,822.4	1,209.6	0.0	\$140.31	\$202.50	\$35.00	1.4	1.2
7	2nd Fl Girls Lavatory	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2000	120.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1		2000		0.0	\$0.00	\$0.00				
7	2nd Fl Boys Lavatory	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2000	120.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1		2000		0.0	\$0.00	\$0.00				
13	Art/ French	7	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2400	1,008.0	7	S 32 P F 2 (ELE)	F42LL	60	0.4	C-OC	1680	705.6	302.4	0.0	\$35.08	\$202.50	\$35.00	5.8	4.8
13	Room 5	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728.0	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OC	1680	1,209.6	518.4	0.0	\$60.13	\$202.50	\$35.00	3.4	2.8
13	Room 6	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728.0	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OC	1680	1,209.6	518.4	0.0	\$60.13	\$202.50	\$35.00	3.4	2.8
13	Room 7	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728.0	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OC	1680	1,209.6	518.4	0.0	\$60.13	\$202.50	\$35.00	3.4	2.8
13	Room 8	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728.0	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OC	1680	1,209.6	518.4	0.0	\$60.13	\$202.50	\$35.00	3.4	2.8
13	Room 9	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728.0	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OC	1680	1,209.6	518.4	0.0	\$60.13	\$202.50	\$35.00	3.4	2.8
13	Computer Lab	13	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	1,872.0	13	S 32 P F 2 (ELE)	F42LL	60	0.8	C-OC	1680	1,310.4	561.6	0.0	\$65.15	\$202.50	\$35.00	3.1	2.6
13	Music Room	6	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2400	864.0	6	S 32 P F 2 (ELE)	F42LL	60	0.4	C-OC	1680	604.8	259.2	0.0	\$30.07	\$202.50	\$35.00	6.7	5.6
201	Bondor	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OC	1680	151.2	64.8	0.0	\$7.52	\$202.50	\$35.00	26.9	22.3
201	Library	20	T 32 R F 3 (ELE)	F43ILL/2	90	1.8	SW	2400	4,320.0	20	T 32 R F 3 (ELE)	F43ILL/2	90	1.8	C-OC	1680	3,024.0	1,296.0	0.0	\$150.34	\$202.50	\$35.00	1.3	1.1
18	Hallway	11	T 32 R F 4 (ELE)	F44ILL	112	1.2	SW	2280	2,809.0	11	T 32 R F 4 (ELE)	F44ILL	112	1.2		2280		0.0	\$0.00	\$0.00				
13	Storage	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1000	180.0	3	S 32 P F 2 (ELE)	F42LL	60	0.2	C-OC	250	45.0	135.0	0.0	\$15.66	\$202.50	\$35.00	12.9	10.7
Total		328				26.5			59,738	328				26	S		25,859	11,787	0	1,367	\$5,670	980		
																S	Demand Savings			0.0	\$0			
																S	kWh Savings			33,879	\$3,930			
																S	Total Savings				\$3,930		1.4	1.2

Cost of Electricity: \$0.116 \$/kWh
\$5.08 \$/kW

Field Code	Area Description	EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS							
		No. of Fixtures	Standard Fixture Code	NYSERDA Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback	
	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/Space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/Space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * (\$/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered	
13	CSA Office	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1,200	144	144	0.0	\$ 16.70	\$ 202.50	\$ 35	12.1	10.0	
13	Business Office	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1,200	72	72	0.0	\$ 8.35	\$ 202.50	\$ 35	24.2	20.1	
201	Business Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	1,200	108	108	0.0	\$ 12.53	\$ 202.50	\$ 35	16.2	13.4	
13	CST Room	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1,680	101	43	0.0	\$ 5.01	\$ 202.50	\$ 35	40.4	33.4	
13	Kindergarten	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OCC	1,680	1,210	518	0.0	\$ 60.13	\$ 202.50	\$ 35	3.4	2.8	
13	Boys Lavatory	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2000	240	2	S 32 P F 2 (ELE)	F42LL	60	0.1		2,000	240	-	0.0	\$ -	\$ -	\$ -	-	-	
13	Boys Locker	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2800	168	1	S 32 P F 2 (ELE)	F42LL	60	0.1		2,800	168	-	0.0	\$ -	\$ -	\$ -	-	-	
13	Wollett	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1,200	144	144	0.0	\$ 16.70	\$ 202.50	\$ 35	12.1	10.0	
13	Nurse	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720	5	S 32 P F 2 (ELE)	F42LL	60	0.3	C-OCC	1,200	360	360	0.0	\$ 41.76	\$ 202.50	\$ 35	4.8	4.0	
7	Nurse	2	2T 32 R F 2 (U) (ELE) Thin Tube	FU2LL	60	0.1	SW	2400	288	2	2T 17 R F 2 (ELE)	F22ILL	33	0.1	C-OCC	1,200	79	209	0.1	\$ 27.51	\$ 405.00	\$ 55	14.7	12.7	
18	Resource	7	T 32 R F 4 (ELE)	F44ILL	112	0.8	SW	2400	1,882	7	T 32 R F 4 (ELE)	F44ILL	112	0.8	C-OCC	1,680	1,317	564	0.0	\$ 65.48	\$ 202.50	\$ 35	3.1	2.6	
13	Speech	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1,680	202	86	0.0	\$ 10.02	\$ 202.50	\$ 35	20.2	16.7	
18	Preschool	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,301	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	C-OCC	1,680	3,011	1,290	0.0	\$ 149.67	\$ 202.50	\$ 35	1.4	1.1	
18	Hallway	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2280	2,298	9	T 32 R F 4 (ELE)	F44ILL	112	1.0		2,280	2,298	-	0.0	\$ -	\$ -	\$ -	-	-	
13	Stairwell	6	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2280	821	6	S 32 P F 2 (ELE)	F42LL	60	0.4		2,280	821	-	0.0	\$ -	\$ -	\$ -	-	-	
215	Gym	9	High Bay MH 350	MHPS/SCWA/350/1	400	3.6	SW	2912	10,483	9	F48T5/HO	F44GHL	234	2.1		2,912	6,133	4,351	1.5	\$ 595.74	\$ 4,781.25	\$ 225	8.0	7.6	
13	Auditorium	20	S 32 P F 2 (ELE)	F42LL	60	1.2	SW	1000	1,200	20	S 32 P F 2 (ELE)	F42LL	60	1.2		1,000	1,200	-	0.0	\$ -	\$ -	\$ -	-	-	
129	Auditorium	16	SP 75 I	I75/I	75	1.2	SW	1000	1,200	16	CF 26	CFQ26/I-L	27	0.4		1,000	432	768	0.8	\$ 135.91	\$ 324.00	\$ -	2.4	2.4	
13	Main Office	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1,200	144	144	0.0	\$ 16.70	\$ 202.50	\$ 35	12.1	10.0	
13	2nd Grade	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OCC	1,680	1,210	518	0.0	\$ 60.13	\$ 202.50	\$ 35	3.4	2.8	
13	1st Grade	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OCC	1,680	1,210	518	0.0	\$ 60.13	\$ 202.50	\$ 35	3.4	2.8	
13	Girls Lavatory	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2000	240	2	S 32 P F 2 (ELE)	F42LL	60	0.1		2,000	240	-	0.0	\$ -	\$ -	\$ -	-	-	
13	Girls Locker	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	2800	504	3	S 32 P F 2 (ELE)	F42LL	60	0.2		2,800	504	-	0.0	\$ -	\$ -	\$ -	-	-	
201	Elevator Hallway	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	2280	410	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2		2,280	410	-	0.0	\$ -	\$ -	\$ -	-	-	
13	Storage	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1000	180	3	S 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	250	45	135	0.0	\$ 15.66	\$ 202.50	\$ 35	12.9	10.7	
13	Kitchen	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1600	384	4	S 32 P F 2 (ELE)	F42LL	60	0.2		1,600	384	-	0.0	\$ -	\$ -	\$ -	-	-	
13	Cafeteria	24	S 32 P F 2 (ELE)	F42LL	60	1.4	SW	1600	2,304	24	S 32 P F 2 (ELE)	F42LL	60	1.4	C-OCC	1,200	1,728	576	0.0	\$ 66.82	\$ 202.50	\$ 35	3.0	2.5	
X4	Hallway	12	X 20 W I 2	EI20/2	40	0.5	SW	2280	1,094	12	XX 3.0 W CF 2	ELED1 5/2	3	0.0		2,280	82	1,012	0.4	\$ 144.50	\$ 1,539.00	\$ 120	10.7	9.8	
18	Science Lab	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	SW	2400	4,032	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	C-OCC	1,680	2,822	1,210	0.0	\$ 140.31	\$ 202.50	\$ 35	1.4	1.2	
7	2nd Fl Girls Lavatory	1	2T 32 R F 2 (U) (ELE) Thin Tube	FU2LL	60	0.1	SW	2000	120	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0		2,000	66	54	0.0	\$ 7.91	\$ 101.25	\$ 10	12.8	11.5	
7	2nd Fl Boys Lavatory	1	2T 32 R F 2 (U) (ELE) Thin Tube	FU2LL	60	0.1	SW	2000	120	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0		2,000	66	54	0.0	\$ 7.91	\$ 101.25	\$ 10	12.8	11.5	
13	Art/ French	7	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2400	1,008	7	S 32 P F 2 (ELE)	F42LL	60	0.4	C-OCC	1,680	706	302	0.0	\$ 35.08	\$ 202.50	\$ 35	5.8	4.8	
13	Room 5	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OCC	1,680	1,210	518	0.0	\$ 60.13	\$ 202.50	\$ 35	3.4	2.8	
13	Room 6	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OCC	1,680	1,210	518	0.0	\$ 60.13	\$ 202.50	\$ 35	3.4	2.8	
13	Room 7	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OCC	1,680	1,210	518	0.0	\$ 60.13	\$ 202.50	\$ 35	3.4	2.8	
13	Room 8	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OCC	1,680	1,210	518	0.0	\$ 60.13	\$ 202.50	\$ 35	3.4	2.8	
13	Room 9	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	S 32 P F 2 (ELE)	F42LL	60	0.7	C-OCC	1,680	1,210	518	0.0	\$ 60.13	\$ 202.50	\$ 35	3.4	2.8	
13	Computer Lab	13	S 32 P F 2 (ELE)	F42LL	60	0.8	SW	2400	1,872	13	S 32 P F 2 (ELE)	F42LL	60	0.8	C-OCC	1,680	1,310	562	0.0	\$ 65.15	\$ 202.50	\$ 35	3.1	2.6	
13	Music Room	6	S 32 P F 2 (ELE)	F42LL	60	0.4	SW	2400	864	6	S 32 P F 2 (ELE)	F42LL	60	0.4	C-OCC	1,680	605	259	0.0	\$ 30.07	\$ 202.50	\$ 35	6.7	5.6	
201	Bondor	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2400	216	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	1,680	151	65	0.0	\$ 7.52	\$ 202.50	\$ 35	26.9	22.3	
201	Library	20	T 32 R F 3 (ELE)	F43ILL/2	90	1.8	SW	2400	4,320	20	T 32 R F 3 (ELE)	F43ILL/2	90	1.8	C-OCC	1,680	3,024	1,296	0.0	\$ 150.34	\$ 202.50	\$ 35	1.3	1.1	
18	Hallway	11	T 32 R F 4 (ELE)	F44ILL	112	1.2	SW	2280	2,809	11	T 32 R F 4 (ELE)	F44ILL	112	1.2		2,280	2,809	-	0.0	\$ -	\$ -	\$ -	-	-	
13	Storage	3	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1000	180	3	S 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	250	45	135	0.0	\$ 15.66	\$ 202.50	\$ 35	12.9	10.7	
Total		328				26.5			59,738	328				23.7			41,648	18,091	3	2,270	12,719	1,365			
																				2.8	\$172				
																			18,091	\$2,099					
																				\$2,270			5.6	5.0	

APPENDIX D

New Jersey Pay For Performance Incentive Program



COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

EXISTING BUILDINGS

PARTICIPATION STEPS

APPLICATIONS AND
FORMS

APPROVED PARTNERS

NEW CONSTRUCTION

FAQS

BECOME A PARTNER

COMBINED HEAT & POWER AND
FUEL CELLS

LOCAL GOVERNMENT ENERGY
AUDIT

LARGE ENERGY USERS PILOT

ENERGY SAVINGS IMPROVEMENT
PLAN

DIRECT INSTALL

ARRA

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL
ELECTRIC CUSTOMERS

TEACH

EDA PROGRAMS

TECHNOLOGIES

TOOLS AND RESOURCES

PROGRAM UPDATES

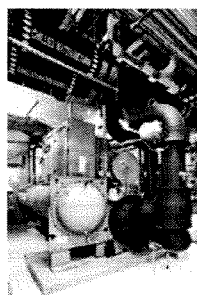
Home » Commercial & Industrial » Programs » Pay for Performance

Pay for Performance - Existing Buildings

Download program applications and incentive forms.

The Greater the Savings, the Greater Your Incentives

Take a comprehensive, whole-building approach to saving energy in your existing facilities and earn incentives that are directly linked to your savings. Pay for Performance relies on a network of program partners who provide technical services under direct contract to you. Acting as your energy expert, your partner will develop an energy reduction plan for each project with a whole-building technical component of a traditional energy audit, a financial plan for funding the energy efficient measures and a construction schedule for installation.



Eligibility

Existing commercial, industrial and institutional buildings with a peak demand over 100 kW for any of the preceding twelve months are eligible to participate including hotels and casinos, large office buildings, multi-family buildings, supermarkets, manufacturing facilities, schools, shopping malls and restaurants. Buildings that fall into the following five customer classes are not required to meet the 100 kW demand in order

to participate in the program: hospitals, public colleges and universities, 501(c)(3) non-profits, affordable multifamily housing, and local governmental entities. Your energy reduction plan must define a comprehensive package of measures capable of reducing the existing energy consumption of your building by 15% or more.

Exceptions to the 15% threshold requirement may be made for certain industrial, manufacturing, water treatment and datacenter building types whose annual energy consumption is heavily weighted on process loads. Details are available in the high energy intensity section of the FAQ page.

ENERGY STAR Portfolio Manager

Pay for Performance takes advantage of the ENERGY STAR Program with Portfolio Manager, EPA's interactive tool that allows facility managers to track and evaluate energy and water consumption across all of their buildings. The tool provides the opportunity to load in the characteristics and energy usage of your buildings and determine an energy performance benchmark score. You can then assess energy management goals over time, identify strategic opportunities for savings, and receive EPA recognition for superior energy performance.



This rating system assesses building performance by tracking and scoring energy use in your facilities and comparing it to similar buildings. That can be a big help in locating opportunities for cost-justified energy efficiency upgrades. And, based on our findings, you may be invited to participate in the Building Performance with ENERGY STAR initiative and receive special recognition as an industry leader in energy efficiency.

Incentives

Pay for Performance incentives are awarded upon the satisfactory completion of three program milestones:

Incentive #1 - Submittal of complete energy reduction plan prepared by an approved program partner - Contingent on moving forward, incentives will be between \$5,000 and \$50,000 based on approximately \$.10 per square foot, not to exceed 50% of the facility's annual energy expense.

Incentive #2 - Installation of recommended measures - Incentives are based on the projected level of electricity and natural gas savings resulting from the installation of comprehensive energy-efficiency measures.

Incentive #3 - Completion of Post-Construction Benchmarking Report - A completed report verifying energy reductions based on one year of post-implementation results. Incentives for electricity and natural gas savings will be paid based on actual savings, provided that the minimum performance threshold of 15% savings has been achieved.



Program

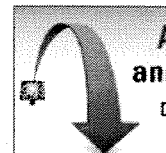
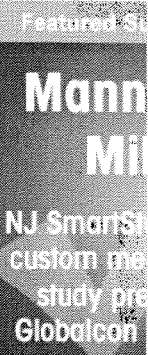
Large Scale CHI
Program Annour

2012 Large Ene
Announcement

Economic Devel
Introduces Rev
Pay for Perform

Incentives Now
Screw-in Lamps

Other updates pos



Follow Us:

CONTACT US

A detailed Incentive Structure document is available on the applications and forms page.

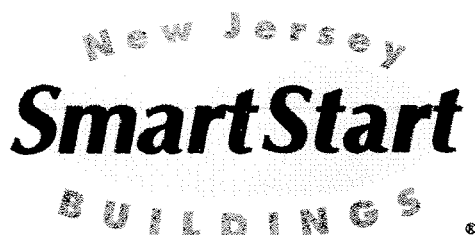
Energy Efficiency Revolving Loan Fund (EE RLF)

New Jersey-based commercial, institutional or industrial entities (including 501(c)(3) organizations) that have received an approved energy reduction plan under Pay for Performance may be eligible for supplemental financing through the EE RLF. The financing, in the form of low-interest loans, can be used to support up to 80% of total eligible project costs, not to exceed \$2.5 million or 100% of total eligible project costs from all public state funding sources. Visit the NJ EDA website for details.

Steps to Participation

[Click here](#) for a step-by-step description of the program.

[Home](#) | [Residential](#) | [Commercial & Industrial](#) | [Renewable Energy](#)
[About Us](#) | [Press Room](#) | [Library](#) | [FAQs](#) | [Calendar](#) | [Newsletters](#) | [Contact Us](#) | [Site Map](#)



2012 PAY FOR PERFORMANCE PROGRAM Existing Buildings Incentive Structure

Incentive #1: Energy Reduction Plan

Incentive Amount:.....\$0.10 per sq ft
Minimum Incentive:.....\$5,000
Maximum Incentive:.....\$50,000 or 50% of facility annual energy cost (whichever is less)

This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP) and is paid upon ERP approval. Incentive is contingent on implementation of recommended measures outlined in the ERP.

Incentive #2: Installation of Recommended Measures

Minimum Performance Target:.....15%

Electric Incentives

Base Incentive based on 15% savings:.....\$0.09 per projected kWh saved
For each % over 15% add:.....\$0.005 per projected kWh saved
Maximum Incentive:.....\$0.11 per projected kWh saved

Gas Incentives

Base Incentive based on 15% savings:.....\$0.90 per projected Therm saved
For each % over 15% add:.....\$0.05 per projected Therm saved
Maximum Incentive:.....\$1.25 per projected Therm saved

Incentive Cap:25% of total project cost

This incentive is based on projected energy savings outlined in the ERP. Incentive is paid upon successful installation of recommended measures.

Incentive #3: Post-Construction Benchmarking Report

Minimum Performance Target:.....15%

Electric Incentives

Base Incentive based on 15% savings:.....\$0.09 per actual kWh saved
For each % over 15% add:.....\$0.005 per actual kWh saved
Maximum Incentive:.....\$0.11 per actual kWh saved

Gas Incentives

Base Incentive based on 15% savings:.....\$0.90 per actual Therm saved
For each % over 15% add:.....\$0.05 per actual Therm saved
Maximum Incentive:.....\$1.25 per actual Therm saved

Incentive Cap:25% of total project cost

This incentive will be released upon submittal of a Post-Construction Benchmarking Report that verifies that the level of savings actually achieved by the installed measures meets or exceeds the minimum performance threshold. To validate the savings and achievement of the Energy Target, the EPA Portfolio Manager shall be used. Savings should be rounded to the nearest percent. Total value of Incentive #2 and Incentive #3 may not exceed 50% of the total project cost. Incentives will be limited to \$1 million per gas and electric account per building; maximum of \$2 million per project. See Participation Agreement for details.

APPENDIX E

ESIP



Your Power to Save
At Home, for Business, and for the Future

HOME

RESIDENTIAL

COMMERCIAL, INDUSTRIAL
AND LOCAL GOVERNMENT

RENEWABLE ENERGY



COMMERCIAL, INDUSTRIAL
AND LOCAL GOVERNMENT

PROGRAMS

- NJ SMARTSTART BUILDINGS
- PAY FOR PERFORMANCE
- COMBINED HEAT & POWER AND FUEL CELLS
- LOCAL GOVERNMENT ENERGY AUDIT
- LARGE ENERGY USERS PILOT
- ENERGY SAVINGS IMPROVEMENT PLAN
- DIRECT INSTALL
- ENERGY BENCHMARKING
- T-12 SCHOOLS LIGHTING INITIATIVE
- OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS
- EDA PROGRAMS
- TEACH
- ARRA
- TECHNOLOGIES
- TOOLS AND RESOURCES
- PROGRAM UPDATES
- CONTACT US

Home » Commercial & Industrial » Programs

Energy Savings Improvement Plan

A new State law allows government agencies to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. Under the recently enacted Chapter 4 of the Laws of 2009 (the law), the "Energy Savings Improvement Program" (ESIP), provides all government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources.

This [Local Finance Notice](#) outlines how local governments can develop and implement an ESIP for their facilities. Below are two sample RFPs:

- Local Government
- School Districts (K-12)

The Board also adopted [protocols](#) to measure energy savings.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Local units should carefully consider all alternatives to develop an approach that best meets their needs. Local units considering an ESIP should carefully review the Local Finance Notice, the law, and consult with qualified professionals to determine how they should approach the task.

FIRST STEP – ENERGY AUDIT

For local governments interested in pursuing an ESIP, the first step is to perform an energy audit. As explained in the Local Finance Notice, this may be done internally if an agency has qualified staff to conduct the audit. If not, the audit must be implemented by an independent contractor and not by the energy savings company producing the Energy Reduction Plan.

Pursuing a [Local Government Energy Audit](#) through New Jersey's Clean Energy Program is a valuable first step to the ESIP approach - and it's free. **Incentives provide 100% of the cost of the audit.**

ENERGY REDUCTION PLANS

If you have an ESIP plan you would like to submit to the Board of Public Utilities, please email it to ESIP@bpu.state.nj.us. Please limit the file size to 3MB (or break it into smaller files).

- Frankford Township School District
- Northern Hunterdon-Voorhees Regional High School
- Manalapan Township (**180 MB** - Right Click, Save As)

Program Updates

- Board Order - Standby Charges for Distributed Generation Customers
- T-12 Schools Lighting Replacement Initiative - Funding Allocation Reached
- Other updates posted.

Featured Success Story

Rutgers
University:
Continued
Commitment to
Saving Energy

Applications
and Brochures

Download the latest
program materials.

e-Newsletter
SIGN UP TODAY!

Follow Us:



LFN 2011-17

June 16, 2011

Contact Information

Director's Office

V. 609.292.6613
 F. 609.292.9073

Local Government Research

V. 609.292.6110
 F. 609.292.9073

**Financial Regulation
 and Assistance**

V. 609.292.4806
 F. 609.984.7388

Local Finance Board

V. 609.292.0479
 F. 609.633.6243

Local Management Services

V. 609.292.7842
 F. 609.633.6243

Authority Regulation

V. 609.984.0132
 F. 609.984.7388

Mail and Delivery

101 South Broad St.
 PO Box 803
 Trenton, New Jersey
 08625-0803

Web: www.nj.gov/dca/dlgs

E-mail: dlgs@dca.state.nj.us

Distribution

Municipal and Freeholder Clerks
 Municipal and County Chief
 Financial Officers
 Local Authority and Fire District
 Officials
 School Business Administrators
 Local Procurement Officials

Local Finance Notice

Chris Christie
 Governor

Kim Guadagno
 Lt. Governor

Lori Grifa
 Commissioner

Thomas H. Neff
 Director

Update on Implementing Energy Savings Improvement Programs

This Local Finance Notice provides guidance concerning Energy Savings Improvement Program (ESIP) matters that affect local units covered under the Local Public Contracts Law (LPCL, N.J.S.A. 40A:11) and the Public School Contracts Law (PSCL, N.J.S.A. 18A:18A).

The Notice covers a model ESCO (Energy Services Company) Request for Proposal document and provides information on using the "Do-It-Yourself" process for implementing an ESIP. This Notice supplements [Local Finance Notice 2009-11](#) concerning ESIPs.

Model ESCO Request for Proposal Document

General Issues

The Division of Local Government Services and the Board of Public Utilities have completed development of a model ESCO Request for Proposal Document. It is designed to assist all organizations (contracting units) covered by the LPCL and PSCL hire an energy services company (ESCO) to develop and implement an Energy Savings Plan (ESP) as part of an Energy Savings Improvement Program as authorized under N.J.S.A. 40A:11-4.6 and 18A:18A-4.6.

Specifically, the document serves as the starting point for these government agencies to select an ESCO through the competitive contracting procedure (N.J.S.A. 40A:11-4.1 et seq. and 18A:18A-4.1 et seq.).

Notwithstanding the efforts of the State agencies to ensure that the RFP is consistent with all relevant procurement procedures, laws, and regulations, there are several issues contracting unit personnel should keep in mind:

- 1) Local legal advisors should review the document to ensure it is consistent with any allowable local practices and legal considerations.
- 2) The individual responsible for managing the project should review the entire RFP in order to be able to answer questions and ensure the document meets local needs.
- 3) Forms have been carefully designed to meet the need of this specific process. Care should be taken if proposed forms are removed and replaced with ones normally used by the contracting unit.

Feedback from users about the model is encouraged and the Division plans to update it as experience warrants. To start this feedback process two immediate options are available to users.

1. An [ESIP webpage](#) has been established for ESIP issues (the model document will be posted there as well) and it has the ability for users to [email comments](#) directly to the Division.
2. The Division will hold a meeting to accept comments from interested parties on the RFP. The meeting is scheduled for Thursday, July 28, 2011 at 9:30, to take place at DCA offices at 101 South Broad Street in Trenton. **Attendees are asked [to register \(via email\)](#)** if they plan to attend or speak; if too many people sign up, we may move the location and will need to contact attendees. **This is not an educational session** – there will be no staff presentations on the RFP and is expressly to take comments that are not submitted in writing. It is expected that professional organizations will sponsor training sessions this fall.

As changes are made, they will be noted in text or in a tracked document and posted to the website. Users are urged to check the site to be sure they are using the latest version. The [GovConnect Local Procurement](#) role will be used to notify procurement officials when a new version has been posted.

Using the Model ESCO RFP

The Model ESCO RFP is broken into several self-explanatory sections:

- Part A. Instructions to Proposers
- Part B. Terms and Conditions
- Part C. Scope of Work
- Part D. Proposal Evaluation
- Part E. Form of Proposal and Content
- Part F. Appendix
- Part G. Proposal Forms

It is designed to be used by contracting units under the LPCL and PSCL, but it requires the user to edit the document to reflect the specific type of contracting unit. These edits are substantive and reference-related edits, and are listed below.

The RFP is designed to minimize the amount of drafting of technical issues related to an ESIP effort. Since development of an Energy Savings Plan (ESP) is based on an audit that meets the statutory requirements previously conducted by the contracting unit, it is the responsibility of the contracting unit to provide proposers with a copy of the audit as part of the ESCO RFP package (or linked to an online posting of the audit).

The audit should guide contracting units to make preliminary decisions concerning energy conservation measures to include in their ESIP. To inform proposers of these decisions, Appendix A of the RFP must be completed by the contracting unit to inform proposers of the projects to be undertaken and any special considerations that proposers are to incorporate into their proposal.

The RFP also uses a formal process for potential proposers to submit questions and requests for clarifications. Appendix B is a form for the submission of these requests and is referred to throughout the text.

Contracting units are also reminded the Competitive Contracting process does not allow for negotiating proposals. While legal elements of the contract (project development agreement) may require legal determinations and modifications, the process does not allow for negotiation of price or related substantive elements and any element that would have provided less than a level playing field for proposers.

Contracting units are also cautioned that setting qualification standards that arbitrarily limit competition is inconsistent with public bidding requirements.

Office of State Comptroller Filing: Contracting units are also reminded of their obligations to meet [State Comptroller requirements for public contracts](#). In accordance with N.J.S.A 52:15C-10, contracting units must notify OSC as early as practicable, but no later than 30 days before advertisement, of any negotiation or solicitation of a contract that may exceed \$10 million. Contracting units must also provide post-award notification for any contract for an amount exceeding \$2 million. Notification must be given within 20 days of the award.

Substantive Edits:

Several sections are highlighted in green. These sections should be carefully edited to meet contracting unit needs. This has important application to evaluation criteria in Section D. Once finalized, the green highlight should be removed.

Section B-16; Insurance should be reviewed by the contracting unit's Risk Management professionals to be sure the standards are appropriate to the contracting unit and the work to be done.

The following Sections also require local decisions and editing:

- A-3: # of copies of proposal and # of CDs to be submitted
- A-4: Web posting address, if desired
- A-5: If extra credit is to be provided on evaluation scoring for attending site walk through
- B-11: Delete LPCL or PSCL section as appropriate
- B-34: Use only if PSCL
- C-1: Explanation of type of audit information
- C-3(k): Include if ESCO is to provide financing option
- Use of Appendix F and Proposal Requirements #8: These forms are related to submission of Political Contribution Disclosure forms. Only PSCL agencies are required to use these forms as pursuant to Public School Fiscal Accountability Procedures (N.J.A.C. 6A23A-6.3). The forms and references to it should be removed for all LPCL users.

Reference Editing:

<Brackets> are used to highlight text that requires user editing. Users need to review each set and edit as necessary to properly reflect the contracting unit's circumstances. For example, brackets are used to reflect statutory references (i.e., LPCL or PSCL listings), the name of owner, or refer to a website. It is urged that preparers use the search function to locate brackets to be sure all references are corrected.

Header: the header section should be edited to reflect the name of the contracting unit

Footer: The footer includes a reference to the version of the RFP document. It is recommended that the reference be removed when the RFP is circulated.

The model includes a draft Cover letter to send to potential proposers. Located immediately following the cover page, it should be removed and used as a separate document, not part of the RFP.

Consider how to refer to the owner's full name or where "owner" is used.

The ESIP Alternative to ESCO: the "Do-it-Yourself" Process

The ESIP law (see [Local Finance Notice 2009-11](#)) allows two approaches to taking advantage of the financing options the law provides. It allows development and implementation using an ESCO and permits a "Do-It-Yourself" (DIY) option.

The DIY approach involves the contracting unit properly procuring services from different organizations to perform the various elements of an ESIP (i.e., audit, ESP preparation, developing construction plans and specification, etc.). It is an alternative to the ESCO approach, where a single organization provides a wide range of services.

Under both contracting models, it is important that contractors performing a range of services do not have conflicts (e.g., the firm developing plans and specifications cannot conduct the final system verification, or the firm that conducts the audit cannot serve as an ESCO).

The DIY approach allows the contracting unit to contract for an energy audit from a NJ Division of Property Management and Construction (DPMC) approved energy auditor. At the conclusion of the audit, the contracting unit can choose to specify energy conservation measures (ECM's) in its ESP than can be implemented through a DIY process. The process (ESCO or DIY) also requires that an independent organization verify the ESP.

Once the governing body approves the ESP, the contracting unit can then hire (subject to procurement law) a DPMC approved professional architect or engineering firm to design the improvements and prepare the plans and specifications for implementing the Energy Savings Plan. In these cases, subject to the contracting unit procurement requirements, the firm conducting the audit and preparing the ESP, if DPMC qualified, may also provide the services necessary to develop plans and specifications for the contracting unit to use for bidding purposes, as long as they provide the contracting unit Errors and Omissions insurance coverage.

Under the ESIP DIY approach, there would be no conflict in a properly procured single organization conducting the audit, developing the ESP, then preparing plans and specifications. This does not apply when using the ESCO approach, where the auditor and ESCO must be independent.

Once construction plans and specifications are complete, the contracting unit would then conduct the bidding process as it would any public works construction project: manage the project as it sees fit (the firm that did the plans could also serve as construction manager), and then contract as necessary for commissioning and final third party verification. The two verification steps (the ESP and verifying implementation) must be performed by an organization independent of the ones preparing the ESP, overseeing construction and commissioning.

By following this process, the contracting unit can then apply to the Local Finance Board for the issuance of ESIP-based energy saving obligations or enter into appropriate lease financing.

The ESIP approach to energy improvement provides a range of options for contracting units to accrue energy savings while improving the environment, taking advantage of low-cost financing and state and federal incentives. DLGS and the BPU encourage comments and questions (through the ESIP web page) on this new opportunity so we can improve it as time goes on.

Approved: Thomas H. Neff, Director, Division of Local Government Services

Table of Web Links

Page	Shortcut text	Internet Address
1, 4	Local Finance Notice 2009-11	http://www.nj.gov/dca/lgs/lfns/09lfns/2009-11.doc
2	ESIP webpage	http://www.nj.gov/dca/lgs/lpcl/esip.htm
2	email comments	mailto:lpcl@dca.state.nj.us
2	to register (via email	mailto:lpcl@dca.state.nj.us
2	GovConnect Local Procurement	http://www.nj.gov/dca/surveys/ppsurvey.htm
3	State Comptroller requirements.	http://www.nj.gov/comptroller/compliance/index.html

APPENDIX F

Alternative Energy Screening



AC Energy & Cost Savings



Frenchtown Elementary School 902 Harrison St. Frenchtown NJ

Station Identification	
City:	Allentown
State:	Pennsylvania
Latitude:	40.65° N
Longitude:	75.43° W
Elevation:	117 m
PV System Specifications	
DC Rating:	83.0 kW
DC to AC Derate Factor:	0.770
AC Rating:	63.9 kW
Array Type:	Fixed Tilt
Array Tilt:	40.7°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	12.5 ¢/kWh

Results			
Month	Solar Radiation (kWh/m ² /day)	AC Energy (kWh)	Energy Value (\$)
1	3.22	6649	831.12
2	3.84	7118	889.75
3	4.71	9370	1171.25
4	5.25	9709	1213.62
5	5.24	9494	1186.75
6	5.25	9061	1132.62
7	5.57	9779	1222.38
8	5.23	9201	1150.12
9	4.85	8525	1065.62
10	4.37	8233	1029.12
11	2.92	5510	688.75
12	2.81	5655	706.88
Year	4.44	98303	12287.88

Output Hourly Performance Data

Output Results as Text

*

About the Hourly Performance Data

Saving Text from a Browser

Run PVWATTS v.1 for another US location or an International location
Run PVWATTS v.2 (US only)

Please send questions and comments regarding PVWATTS to Webmaster

Disclaimer and copyright notice



Return to RReDC home page (<http://www.nrel.gov/rredc>)

APPENDIX G

EPA Portfolio Manager



STATEMENT OF ENERGY PERFORMANCE

Edith Ort Thomas Elementary School

Building ID: 3207223

For 12-month Period Ending: May 31, 2012¹

Date SEP becomes ineligible: N/A

Date SEP Generated: July 31, 2012

Facility

Edith Ort Thomas Elementary School
902 Harrision St.
Frenchtown, NJ 08825

Facility Owner

N/A

Primary Contact for this Facility

N/A

Year Built: 1925**Gross Floor Area (ft²):** 35,518**Energy Performance Rating² (1-100)** 74**Site Energy Use Summary³**

Electricity - Grid Purchase(kBtu)	731,942
Fuel Oil (No. 2) (kBtu)	2,019,944
Natural Gas - (kBtu) ⁴	0
Total Energy (kBtu)	2,751,886

Energy Intensity⁴

Site (kBtu/ft ² /yr)	77
Source (kBtu/ft ² /yr)	126

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	252
---	-----

Electric Distribution Utility

Jersey Central Power & Light Co [FirstEnergy Corp]

National Median Comparison

National Median Site EUI	98
National Median Source EUI	160
% Difference from National Median Source EUI	-21%
Building Type	K-12 School

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards⁵ for Indoor Environmental Conditions:

Ventilation for Acceptable Indoor Air Quality	N/A
Acceptable Thermal Environmental Conditions	N/A
Adequate Illumination	N/A

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Values represent energy intensity, annualized to a 12-month period.
5. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Building Name	Edith Ort Thomas Elementary School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	902 Harrision St., Frenchtown, NJ 08825	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of a hospital, k-12 school, hotel and senior care facility) nor can they be submitted as representing only a portion of a building.		☐
School (K-12 School)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☒
Gross Floor Area	35,518 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		☐
Number of PCs	45	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	0 (Default)	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	Yes (Default)	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 % (Default)	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	8(Optional)	Is this school in operation for at least 8 months of the year?		☐

High School?	No	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.	☐
--------------	----	--	--------------------------

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Jersey Central Power & Light Co [FirstEnergy Corp]

Fuel Type: Electricity		
Meter: Electricity (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
05/01/2012	05/31/2012	20,640.00
04/01/2012	04/30/2012	17,120.00
03/01/2012	03/31/2012	18,560.00
02/01/2012	02/29/2012	18,560.00
01/01/2012	01/31/2012	18,080.00
12/01/2011	12/31/2011	17,600.00
11/01/2011	11/30/2011	16,480.00
10/01/2011	10/31/2011	17,600.00
09/01/2011	09/30/2011	13,280.00
08/01/2011	08/31/2011	14,880.00
07/01/2011	07/31/2011	19,960.00
06/01/2011	06/30/2011	21,760.00
Electricity Consumption (kWh (thousand Watt-hours))		214,520.00
Electricity Consumption (kBtu (thousand Btu))		731,942.24
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		731,942.24
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐
Fuel Type: Fuel Oil (No. 2)		
Meter: Fuel Oil #2 (Gallons) Space(s): Entire Facility		
Start Date	End Date	Energy Use (Gallons)
05/01/2012	05/31/2012	0.00
04/01/2012	04/30/2012	0.00
03/01/2012	03/31/2012	0.00
02/01/2012	02/29/2012	0.00
01/01/2012	01/31/2012	2,541.10
12/01/2011	12/31/2011	0.00
11/01/2011	11/30/2011	0.00
10/01/2011	10/31/2011	0.00
09/01/2011	09/30/2011	0.00
08/01/2011	08/31/2011	0.00

07/01/2011	07/31/2011	12,023.30
06/01/2011	06/30/2011	0.00
Fuel Oil #2 Consumption (Gallons)		14,564.40
Fuel Oil #2 Consumption (kBtu (thousand Btu))		2,019,943.92
Total Fuel Oil (No. 2) Consumption (kBtu (thousand Btu))		2,019,943.92
Is this the total Fuel Oil (No. 2) consumption at this building including all Fuel Oil (No. 2) meters?		☐

Additional Fuels

Do the fuel consumption totals shown above represent the total energy use of this building?
Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.

☐

On-Site Solar and Wind Energy

Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.

☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility

Edith Ort Thomas Elementary School
902 Harrison St.
Frenchtown, NJ 08825

Facility Owner

N/A

Primary Contact for this Facility

N/A

General Information

Edith Ort Thomas Elementary School	
Gross Floor Area Excluding Parking: (ft ²)	35,518
Year Built	1925
For 12-month Evaluation Period Ending Date:	May 31, 2012

Facility Space Use Summary

School	
Space Type	K-12 School
Gross Floor Area (ft ²)	35,518
Open Weekends?	No
Number of PCs	45
Number of walk-in refrigeration/freezer units ^d	0
Presence of cooking facilities ^d	Yes
Percent Cooled	100
Percent Heated ^d	100
Months ^o	8
High School?	No
School District ^o	Frenchtown BOE

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 05/31/2012)	Baseline (Ending Date 04/30/2012)	Rating of 75	Target	National Median
Energy Performance Rating	74	71	75	N/A	50
Energy Intensity					
Site (kBtu/ft ²)	77	82	77	N/A	98
Source (kBtu/ft ²)	126	130	125	N/A	160
Energy Cost					
\$/year	\$ 80,298.45	\$ 79,492.71	\$ 79,707.72	N/A	\$ 101,927.63
\$/ft ² /year	\$ 2.26	\$ 2.24	\$ 2.24	N/A	\$ 2.87
Greenhouse Gas Emissions					
MtCO ₂ e/year	252	263	250	N/A	320
kgCO ₂ e/ft ² /year	7	7	7	N/A	9

More than 50% of your building is defined as K-12 School. Please note that your rating accounts for all of the spaces listed. The National Median column presents energy performance data your building would have if your building had a median rating of 50.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.

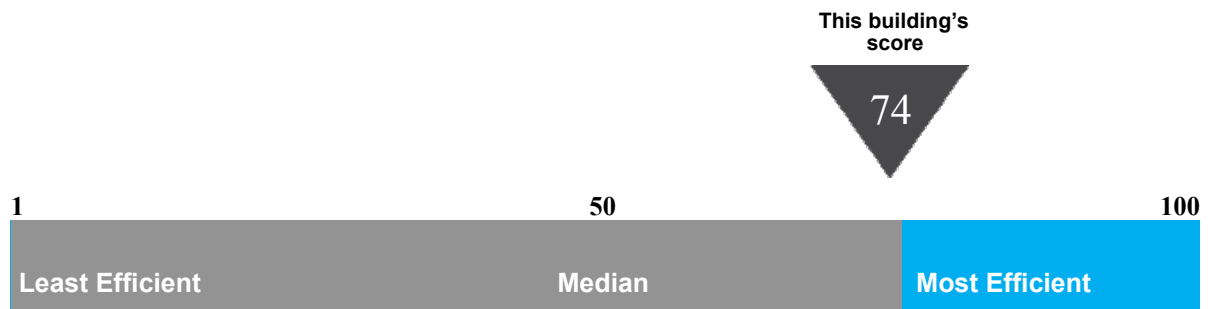
Statement of Energy Performance

2012

Edith Ort Thomas Elementary School
902 Harrsion St.
Frenchtown, NJ 08825

Portfolio Manager Building ID: 3207223

The energy use of this building has been measured and compared to other similar buildings using the Environmental Protection Agency's (EPA's) Energy Performance Scale of 1–100, with 1 being the least energy efficient and 100 the most energy efficient. For more information, visit energystar.gov/benchmark.



This building uses 126 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending May 2012

Buildings with a score of
75 or higher may qualify
for EPA's ENERGY STAR.

I certify that the information contained within this statement is accurate and in accordance with U.S.
Environmental Protection Agency's measurement standards, found at energystar.gov

Date of certification

