# FRANKLIN LAKES PUBLIC SCHOOL DISTRICT FRANKLIN AVENUE MIDDLE SCHOOL ENERGY ASSESSMENT

for

# NEW JERSEY BOARD OF PUBLIC UTILITIES

**CHA PROJECT NO. 24497** 

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### 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 school 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 school staff and spot measurements taken in the field.

### 1.0 EXECUTIVE SUMMARY

The Franklin Lakes Public School District recently 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:

			Construction
<b>Building Name</b>	Address	Square Feet	Date
Franklin Avenue Middle	755 Franklin Avenue	85,106	1995
School	Franklin Lakes, NJ 07417		

The Energy Conservation Measures (ECMs) identified in this report will allow for a more efficient use of energy and if pursued have the opportunity to qualify for the New Jersey SmartStart Buildings Program and/or Direct Install Program. Potential annual savings of \$9,800 for the recommended ECMs may be realized with a payback of 7.3 years. A summary of the costs, savings, and paybacks for the recommended ECMs follows:

	Sumi	mary of Ene	rgy Conserv	vation Meas	ures		
Ene	ergy Conservation Measure	Approx. Costs	Approx. Savings (\$/year)	Payback (Years) w/o Incentive	Potential Incentive (\$)*	Payback (Years) w/ Incentive	Recommended For Implementation
ECM-1	Air Handler Replacement (AHU-1 & AHU-2)	116,000	900	>20	4,300	>20	
ECM-2	Boiler Replacement	265,000	300	>20	9,000	>20	
ECM-3	Replace DWH	7,000	300	>20	500	>20	
ECM-4	Install VSD & Premium Motors on HW Pumps	10,000	1,900	5	2,300	4	X
ECM-5	Demand Controlled Ventilation (Gym & Cafeteria)	20,000	1,500	13	0	13	X
ECM-6	Walk-in Cooler Controls	15,000	900	17	0	17	
ECM-7	Seal Windows Properly	14,000	700	20	0	20	
ECM-8	Lighting Replacement / Upgrades	50,000	2,800	18	5,500	16	
ECM-9	Install Lighting Controls (Occupancy Sensors)	22,000	5,700	4	3,900	3	X
ECM- 10	Lighting Replacements with Lighting Controls (Occupancy Sensors)	72,000	7,900	9	9,400	8	
ECM- 11	Install Low Flow Plumbing Fixtures	6,000	700	9	0	9	X

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### 2.0 INTRODUCTION AND BACKGROUND

The Franklin Avenue Middle School building is an 85,106 square foot school consisting of two floors. The building was constructed in 1995. The school includes classrooms, offices, multipurpose room, gymnasium, and a media center. The school hours of operation are from 8:00 AM – 2:45 PM Monday through Friday, with various after-school activities. The employees work hours are from 7:00 AM – 4:00 PM. The building is occupied approximately 8 hours per day Monday through Friday; totaling 40-50 hours per week. The school has approximately 490 students and 50 staff members.

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



### 3.0 EXISTING CONDITIONS

### 3.1 **Building – Envelope**

The building envelope of the main building and addition are constructed of block walls (CMU) with a brick veneer. The majority of the interior walls are also painted block walls; 5/8" metal studs finished with gypsum board are used in spaces such as front office areas. The flat roof is constructed of 4" plywood, 4 ply built up roofing system manufactured by W.P. Hickman.

Windows and doors are original to the time of construction and in good condition. Windows are aluminum frame and double pane. The school commented on improper sealing around the windows. This leads to infiltration and increased energy usage to condition the air leaking in through windows.

### 3.2 **Utility Usage**

The utility consumption for the school includes electricity, natural gas for heating, and potable water. Electricity is delivered by Orange & Rockland and supplied by Direct Energy. Natural gas delivered by PSE&G and supplied by Woodruff Energy and Hess.

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	1,166,200	kWh/yr
Annual Cost	157,900	\$
Blended Rate	0.135	\$/kWh
Supply Rate	0.130	\$/kWh
Demand Rate	3.44	\$/kW
Peak Demand	146.2	kW
Min. Demand	104.2	kW
Avg. Demand	135.1	kW
	Natural Gas	
Annual Usage	15,572	Therms/yr
Annual Cost	15,958.23	\$
Rate	1.02	\$/Therm

Electrical usage was generally higher in the summer months when air conditioning equipment was operational. Natural Gas consumption was highest in winter months for heating.

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: <a href="http://www.state.nj.us/bpu/commercial/shopping.html">http://www.state.nj.us/bpu/commercial/shopping.html</a>. 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

Hot water (HW) provides heat in the school. Three A.O. Smith LB1000 condensing hot water boilers, located in the mechanical room, have an inputs of 1,000,000 BTU, output of 900,000 BTU; 90% efficiency. They were installed in 1995 and are in good condition. These boilers have hot water reset based on OA temp. The HW is pumped to the building to serve the building by two 7.5 HP pumps that are 85.5% efficient. The primary heating terminal units are classroom unit ventilators. Small classrooms are conditioned with a single Unit Ventilator (UV) while larger ones have two UVs. Supplemental heat is provided by fin tub radiators.

These UVs provide heating for the spaces they serve. Rooms 210, 208, 206 / 202, 119, 113, 122, 114, 135, 153 / 154, 225, 148, gymnasium, hallways, common areas, TV studio, main office, media center, and cafeteria have dedicated Roof Top Units (RTUs) to condition those spaces. All the units are packaged rooftop unit. Split systems are equipped with direct expansion (DX) cooling coils and connected to a dedicated remote condensing unit located outdoors, either on the roof or ground, are utilized to cool a couple of spaces like the weight room and server room.

Each space has a sensor that is tied into the BAS that controls the temperature to +/- 3 degrees of the setpoint.

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

### 3.4 Control Systems

The building is controlled by a Johnson Controls Metasys 6000 building automation system (BAS). The boilers, UVs, rooftop units, and the pumps are controlled by the BAS. A computer in the school director's office controls the systems in the school. Out of the three schools audited, two have a web-enabled Direct Digital controls (DDC) system that the school manager can log onto remotely and make changes to the system. This building is one of those two schools.

Typical setpoints in the school are 70°F heating and 74°F cooling during occupied times, and 62°F heating and 80°F cooling during unoccupied times. Each setpoint has +/- 3 degree variance. Each space has a sensor that is tied into the BAS.

### 3.5 Lighting/Electrical Systems

The school was upgraded in 2010 with new lamps bulbs and occupancy sensors to control the lighting system under the PSE&G Direct Install Program. Select area lights are still switched

manually; exceptions are the janitor closets, mechanical room, cafeteria and gymnasium. Some classrooms, office spaces and restrooms have sensors but there is an opportunity to add ceiling mounted sensors to other classrooms, offices and restrooms. The school has all electronic ballast. Generally speaking the school has compact florescent lighting (CFLs). Classrooms, corridor and gym fixtures are four foot T-8 32W recessed fluorescents. Office spaces are compact fluorescent twin biaxial lamps.

Parking lot lighting consists of pole mounted high pressure sodium light fixtures which are on a timer. The building exterior utilizes 250W MVR lamps and Luminaire wall packs.

### 3.6 Domestic Hot Water Systems

The school utilizes a BTU RHEEM G100-200 domestic hot water heater (DWH) to produce domestic hot water (DHW). The capacity is 100 gallon and was installed in 2010. The input is 199,900 BTU/hr and is estimated to be 80% efficient.

### 3.7 Plumbing Systems

The majority of the plumbing fixtures are low flow, 1.6 gallons per flush water closets, 1.0 gallon per flush urinals and 2.0 gallon per minute faucets. However, there were 8 water closets and 3 urinals that appear to have high-flow flush valves. The plumbing fixtures are in good condition.

### 4.0 ENERGY CONSERVATION MEASURES

### 4.1 ECM-1 Air Handler Replacement (AHU-1 & AHU-2)

Two McQuay RDS serve the Cafeteria / Stage area. These units have a remote condenser and were installed in 2005. The RTUs contain DX cooling and natural gas heating. Medium pressure gas piping is routed on the roof, and is pressure regulated to low pressure at each unit. Each RTU is mounted on an extended curb, with gravity pressure relief dampers and full economizer dampers. It is unclear if the economizer sections are operable. Supply and return ductwork is routed down through the roof curbs to a duct distribution system above the ceilings to each space. It is recommended that the RTUs be replaced through attrition with higher energy efficiency ratio (EER) models. The school director mentioned that these units were giving the school problems.

The assumption of this calculation is that the operating hours, number of units, and capacity stays the same. The energy savings result from operating higher efficiency units than the existing.

Rooftop units have an expected life of 25 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 162,500 kWh and \$22,500.

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

ECM-1 Air Handler Replacement (AHU-1 & AHU-2)

Budgetary		Ai	nnual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost						Maintenance	Savings	ROI	Incentive*	(without	(with
	Electricity Natural Gas			Water	Total	Savings				Incentive)	Incentive)
\$	kW kWh		Therms	kGals	\$	\$	\$		\$	Years	Years
116,000	0 6,500		0	0	900	0	900	(0.8)	4,300	>20	>20

<sup>\*</sup> Incentive shown is per the New Jersey Direct Install Program. See section 5.0 for other incentive opportunities.

This measure is not recommended.

### 4.2 ECM-2 Boiler Replacement

The school utilizes Three A.O. Smith LB1000 condensing hot water boilers. These boilers are located in the mechanical room, have inputs of 1,000,000 BTU, outputs of 900,000 BTU; 90% efficiency. They were installed in 1995 and are in good condition. The school director mentioned having issues with these boilers during the field visit. This ECM would involve replacing the existing boilers with three 1,000 MBH condensing boilers. Condensing boilers operate at higher efficiencies when producing lower water temperatures, typically in the 92-96% range. The increased system efficiency will result in lower natural gas usage.

Natural gas-fired boilers have an expected life of 25 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 7,500 therms of natural gas and \$7,500. The proposed boiler replacement will involve piping and wiring modifications as well as new venting and combustion air ducting.

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

**ECM-2** Boiler Replacement

Budgetary		Aı	nnual Utility Sa	vings		Estimated	Total		Potential Incentiv	Payback	Payback
Cost							Savings	ROI	e*	(without	(with
	Elec	Electricity Natural Gas Water Total				Savings				Incentive)	Incentive)
\$	kW kWh		Therms	kGals	\$	\$	\$		\$	Years	Years
265,000	0	0	300	0	300	0	300	(1.0)	9,000	>20	>20

<sup>\*</sup> Incentive shown is per the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities

This measure is not recommended.

# 4.3 ECM-3 Replace DHW

The school utilizes a 100 gallon, 199,900 BTU RHEEM G100-200 domestic hot water heater (DWH) to create domestic hot water (DHW). The DHW is 80% efficiency and has eight more years of useful life according to ASHRAE. This ECM assesses replacing this DWH with a more efficient tankless type domestic water heater sized to meet the DHW requirements of the building.

According to the U.S. Department of Energy, 2.5% of stored capacity is lost every hour during DHW heater standby. This value was applied to the total volume to determine annual standby losses. Proposed efficiency was based on a typical high efficiency natural gas condensing type hot water heater. The new water heater will require water and gas piping modifications, venting, and electrical connections.

Domestic hot water heaters have an expected life of 12 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 3,600 therms and \$3,600.

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

**ECM-3 Replace DHW** 

Budgetary		Aı	nnual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost							Savings	ROI	Incentive*	(without	(with
	Electricity Natural Gas Water Total				Savings				Incentive)	Incentive)	
\$	kW kWh Therms Kgals \$				\$	\$		\$	Years	Years	
7,,000	0 0 300 0 300				0	300	(0.4)	500	>20	>20	

<sup>\*</sup> Incentive shown is per the New Jersey SmartStart Install Program. See section 5.0 for other incentive opportunities.

This measure is not recommended.

### 4.4 ECM-4 Install VSDs and Premium Motors on HW Pumps

The hot water system is served by two (2) 7.5 HP pumps. The pumps are constant volume with standard efficiency motors. The hot water system pumps operate at a constant speed (constant water flows) even though the building load does not require all of the flow to maintain temperatures. By adding variable speed drives (VSDs) and inverter duty premium efficiency motors, and reducing the flow (by slowing the motors down), significant electrical energy can be saved.

The calculation use a system "on" set point of 55°F and bin weather data to estimate the heating hours of the building for the year. It was calculated that the heating hours are 4,887. The assumption of this calculation is that the operating hours, motor horsepower, and capacity stay the same.

VSDs have an expected life of 15 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 213,000 kWh and \$28,500.

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

ECM-4 Install VSDs and Premium Motors on HW Pumps

Budgetary		Aı	nnual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost						Maintenance	Savings	ROI	Incentive*	(without	(with
	Electricity Natural Gas Water Total				Savings				Incentive)	Incentive)	
\$	kW	kWh	Therms	Kgals	\$	\$	\$		\$	Years	Years
10,000	0	0 14,200 0 0 1,900			0	1,900	2.8	2,300	5.3	4.1	

<sup>\*</sup> Does not qualify for an Incentive per the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities.

This measure is recommended.

### 4.5 ECM-5 Demand Controlled Ventilation (DCV) (Gym & Cafeteria)

The gymnasiums and cafeteria have dedicated rooftop units which are designed to provide ventilation based on maximum occupancy. This occurs infrequently and reducing the amount of ventilation will result in energy savings. Installation of carbon dioxide (CO2) sensors will allow for a reduction of outside air during periods of low occupancy. The quantity of ventilation air will be based on maintaining an acceptable CO2 level in the space as an indicator of indoor air quality. A limit of 1000 PPM of CO2 is recommended in ASHRAE Standard 62-2010, Ventilation for Acceptable Indoor Air Quality. Sensors will be installed to measure the building air CO2 concentration, and the control sequence of operation changed. During unoccupied periods, the outside air dampers should be closed.

Bin weather data was utilized to obtain the annual operating hours required to maintain the current setpoint of  $70^{\circ}F$ . The BTU/Hr rating is calculated from the OA conditions and CFM. It is assumed that installing the controls will reduce the amount of OA to be conditioned by 20%. The annual thermal and electric usage was estimated. The energy saving is the difference in electric and natural gas usage.

Controls have an expected life of 15 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 348,000 kWh, 15,000 therms and \$61,500.

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

ECM-5 Demand Controlled Ventilation (DCV) (Gym & Cafeteria)

Budgetary		Ai	nnual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost						Maintenance	Savings	ROI	Incentive*	(without	(with
	Electricity Natural Gas Water Total				Savings				Incentive)	Incentive)	
\$	kW	kW kWh Therms I			\$	\$	\$		\$	Years	Years
20,000	0	5,700	700	0	1,500	0	1,500	0.1	0	13.3	13.3

<sup>\*</sup> Does not qualify for an Incentive per the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities.

This measure is recommended.

### 4.6 ECM-6 Walk-in Cooler Controls

The cafeteria kitchen contains a walk-in cooler. These do not have controls and run continuously throughout the day. Installing a CoolTrol® Cooler Control System to reduce run time of evaporator fans, and door and frame heaters was assessed.

CoolTrol controls have an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 94,500 kWh and \$13,500.

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

**ECM-6 Walk-in Cooler and Freezer Controls** 

Budgetary		Aı	nnual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost						Maintenance	Savings	ROI	Incentive*	(without	(with
	Elec	Electricity Natural Gas			Total	Savings				Incentive)	Incentive)
\$	kW	kWh	Therms	kGals	\$	\$	\$		\$	Years	Years
15,000	0	6,300	0	0	900	0	900	(0.1)	0	16.7	16.7

<sup>\*</sup> Incentive shown is per the New Jersey Direct Install Program. See section 5.0 for other incentive opportunities.

This measure is not recommended.

### 4.7 ECM-7 Seal Windows Properly

The school has 2,600 square feet of window area. These windows are constructed with aluminum frames and double pane glazing. Due to improper installation windows incur excess air infiltration. This ECM assesses sealing the windows properly to minimize infiltration which will yield less energy being consumed to condition the space.

Per the building energy audit, it was found that the existing windows have an infiltration rate of about 0.2 CFM/LF. To calculate the savings for this measure, the baseline energy loss was found by applying this value to the total perimeter length of the existing windows in conjunction with weather bin data. The proposed energy loss was then determined using the expected infiltration

rate of 0.1 CFM/LF. The difference in heating and cooling losses through the windows resulted in an annual savings of about 900 kWh and 600 therms.

Windows seals have an expected life of 12 years, according to manufacturer; total energy savings over the life of the windows are estimated at 10,800 kWh and 7,200 therms, which results in a cost savings of \$8,400-without inflation/escalation.

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

**ECM-7 Seal Windows Properly** 

Budgetary		Aı	nnual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost						Maintenance	Savings	ROI	Incentive*	(without	(with
	Electricity Natural Gas Water Total				Savings				Incentive)	Incentive)	
\$	kW kWh Therms Kgals \$				\$	\$	\$		\$	Years	Years
14,000	0	900	600	0	700	0	700	(0.4)	0	20.0	20.0

<sup>\*</sup> Does not qualify for an Incentive per the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities.

This measure is not recommended.

### 4.8 ECM-8 Lighting Replacement / Upgrades

The school was upgraded in 2010 with new lamps bulbs and occupancy sensors to control the lighting system under the PSE&G Direct Install Program. Select area lights are still switched manually; exceptions are the janitor closets, mechanical room, cafeteria and gymnasium. Some classrooms, office spaces and restrooms have sensors but there is an opportunity to add ceiling mounted sensors to other classrooms, offices and restrooms. The school has all electronic ballast. Generally speaking the school has compact florescent lighting (CFLs). Classrooms, corridor and gym fixtures are four foot T-8 32W recessed fluorescents. Office spaces are compact fluorescent twin biaxial lamps.

Energy savings for this measure were calculated by applying the existing and proposed fixture wattages to estimated times of operation. The difference between energy requirements resulted in a total annual savings of 19,000 kWh with an electrical demand reduction of about 8.3 kW. Supporting calculations, including assumptions for lighting hours and annual energy usage for each fixture, are provided in Appendix C.

Lighting has an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 285,000 kWh and \$42,000.

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

ECM-8 Lighting Replacement / Upgrades

Budgetary	Aı	nnual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost					Maintenance	Savings	ROI	Incentive*	(without	(with
	Electricity	Natural Gas	Savings				Incentive)	Incentive)		

\$	kW	kWh	Therms	kGals	\$	\$	\$		\$	Years	Years
50,000	8.3	19,000	0	0	2,800	0	2,800	(0.2)	5,540	17.8	15.9

<sup>\*</sup> 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-9. However, lights should be replaced through attrition as bulbs fail.

### **4.9** ECM-9 Install Lighting Controls (Occupancy Sensors)

Review of the comprehensive lighting survey determined that lighting in some restrooms, offices, hallways and various other spaces, are typically operational, regardless of occupancy. Therefore, installing an occupancy sensor in these spaces to turn off lights when the areas are unoccupied was assessed.

Using a process similar to that utilized in section 4.8, the energy savings for this measure were calculated by applying the known 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 an annual savings of 43,900 kWh. Ceiling-mounted occupancy sensors with dimmer control are required for this measure.

Occupancy sensors have an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 658,500 kWh and \$85,500.

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

**ECM-9 Install Lighting Controls (Occupancy Sensors)** 

Budgetary		Anr	nual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost						Maintenance	Savings	ROI	Incentive*	(without	(with
	Natural Electricity Gas Water Total				Savings				Incentive)	Incentive)	
\$	kW	kW kWh Therms kGals			\$	\$	\$		\$	Years	Years
23,000	0	43,900	0	5,700	3.0	3,900	3.9	3.2			

<sup>\*</sup> Incentive shown is per the New Jersey Direct Install Program. See section 5.0 for other incentive opportunities.

This measure is not recommended due to the lighting being replaced in 2010.

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

Due to interactive effects, the energy and cost savings for occupancy sensors and lighting upgrades are not cumulative. This measure is a combination of ECMs-8 and 9 to reflect actual expected energy and demand reduction.

The lighting retrofits and controls have an expected lifetime of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 1,006,500 kWh and \$136,500.

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

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

Budgetary		Anr	nual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost						Maintenance	Savings	ROI	Incentive*	(without	(with
	Ele	Natural Electricity Gas Water Total				Savings				Incentive)	Incentive)
\$	kW	kWh	Therms	kGals	\$	\$	\$		\$	Years	Years
72,000	8.3 58,500 0 0 7,900				0	7,900	0.9	9,400	9.1	7.9	

<sup>\*</sup> Incentive shown is per the New Jersey Direct Install Program. See section 5.0 for other incentive opportunities.

This measure is not recommended.

## 4.11 ECM-11 Install Low Flow Plumbing

The school has a mixture of older and newer style fixtures in the restrooms. The older style fixtures consume more water than modern plumbing fixtures. It was determined that there is a combination of 21 toilets and urinals with an average water use of 3.5 gal/flush. Per the number of occupants, it was estimated that each toilet and faucet is utilized approximately nine 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 fixtures in the restrooms with 1.28 gals/flush toilets would save 100 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 1,500 kGal and \$10,500.

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

**ECM-11 Install Low Flow Plumbing** 

Budgetary		Aı	nnual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost						Maintenance	Savings	ROI	Incentive*	(without	(with
	Electricity Natural Gas Water Total			Savings				Incentive)	Incentive)		
\$	kW	kWh	Therms	kGals	\$	\$	\$		\$	Years	Years
6,000	0	0	0	100	700	0	700	0.9	0	8.6	8.6

<sup>\*</sup> 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 school 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/SFMinimum incentive: \$5,000

• Maximum Incentive: \$50,000 or 50% of School annual energy cost

The standard incentive pays \$0.10 per square foot, up to a maximum of \$50,000, not to exceed 50% of school 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:

	Ir	centive	s \$
	Electric	Gas	Total
Incentive #1	\$0	\$0	\$8,511
Incentive #2	\$0	\$0	\$0
Incentive #3	\$0	\$0	\$0
Total	\$0	\$0	\$8,511

The current recommended ECM's don't meet the minimum annual savings of 15% required by the P4P program and therefore the building is not eligible for incentives #2 and #3. See Appendix D for additional analysis.

### 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 Public Service Electric and Gas (PSE&G) Direct Install Program

The Public Service Electric and Gas (PSE&G) Direct Install Program targets government and non-profit customer facilities where the peak electrical demand does not exceed 150 kW in any of the previous 12 months. All elementary and secondary schools are considered regardless of size and rate class. Customers must be a PSE&G customer of record with separately metered PSE&G electric or gas account.

Direct Install is funded through PSE&G and is designed to provide capital for building energy upgrade projects to fast track implementation. The program will pay up to 80% of the costs for lighting retrofits including sensors and controls, refrigeration, motors, HVAC and site-specific custom projects. PSE&G makes the investment in energy efficiency upgrades easy for the client by initially covering 100% of the cost to install the recommended energy efficiency measures. The client will repay the remaining 20% of the total cost to install the energy efficiency measures,

interest free, over the next two years on your PSE&G bill or one lump sum payment depending on the clients preference. If a building is eligible for this funding, the PSE&G Direct Install Program can significantly reduce the implementation cost of energy conservation projects.

Installations must be completed by a PSE&G Direct Install participating contractor which is assigned by the PSE&G project manager. More information regarding the program can be found on PSE&G's website at:

http://www.pseg.com/business/small\_large\_business/save\_energy/gov\_efficiency.jsp.

Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this document once the cost proposal is approved.

This program is applicable to the Franklin Ave Middle School based on the school's average peak demand of 146 kW.

### 5.1.4 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 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, 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 a maximum amount of \$75,000 per building, and up to \$250,000 per customer per year. 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 not applicable to the Franklin Ave Middle School based on the school's average peak demand of 281.6 kW.

### 5.1.5 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.

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### 6.0 ALTERNATIVE ENERGY SCREENING EVALUATION

### 6.1 Solar

### 6.1.1 Photovoltaic Rooftop Solar Power Generation

The school 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 large solar cell array.

The PVWATTS solar power generation model was utilized to calculate PV power generation. The closest city available in the model is Newark, New Jersey and a fixed tilt array type was utilized to calculate energy production.

Installation of (PV) arrays in the state 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 \$75/ SREC per year based on current market data, and this number was utilized in the cash flow for this report.

The existing load justifies the use of a 170.0 kW PV solar array. The system costs for PV installations were derived from contractor budgetary pricing in the state of New Jersey for estimates of total cost of system installation. It should be noted that the cost of installation is currently about \$4.00 per watt or \$4,000 per kW of installed system. Other cost considerations will also need to be considered such as structural reinforcement of the roof. PV panels have an approximate 20 year life span; however, the inverter device that converts DC electricity to AC has a life span of 10 to 12 years and will need to be replaced multiple times during the useful life of the PV system.

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

Photovoltaic (PV) Rooftop Solar Power Generation – 170.0 kW System

Budgetary  Cost		Annual Utility Savings				New Jersey Renewable Energy Incentive*	New Jersey Renewable SREC**	Payback (without incentive)	Payback (with incentives)
	Electricity Natural Gas Total								
\$	kW	kWh	Therms	\$	\$	\$	\$	Years	Years
680,000	170.0	221,567	0	29,912	29,912	0	16,618	>20	14.6

<sup>\*\*</sup> Estimated Solar Renewable Energy Certificate Program (SREC) for 15 years at \$75/1000 kWh

This measure is not recommended due to the long payback time. It is suggested, however, that the market for SREC credits is closely monitored. This market is fluctuating, and if the value per SREC is increased the measure could potentially show for a shorter payback in the near future.

### 6.1.2 Solar Thermal Hot Water Plant

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

A standard solar hot water system is typically composed of solar collectors, heat storage vessel, piping, circulators, and controls. 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.

Several options 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 gas-fired water heaters and, therefore, this measure would offer natural gas utility savings.

This measure is not recommended due to the relatively low use of domestic hot water throughout the entire year.

### **6.2** Demand Response Curtailment

Presently, electricity is delivered by Orange & Rockland, which receives the electricity from regional power grid RFC. Direct Energy 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 school utilizing an emergency generator; therefore, reducing the electrical demand on the utility grid. This program is to benefit the utility company during high demand periods and utility provider offers incentives to the CSP to participate in this program. Enrolling in the program will require program participants to drop electrical load or turn on emergency generators during high electrical demand conditions or during emergencies. Part of the program also will 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. From June 2011 through May 2012, the electric usage for the school had a maximum electricity demand of 182.0 kW and a minimum of 98.0 kW. The monthly average over the observed 12 month period was 164.0 kW.

This measure is not recommended.

### 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 and Energy Star label, the energy benchmark rating must be at least 75. As energy use decreases from implementation of the proposed measures, 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 school 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. To provide an equitable comparison for different buildings with varying proportions of primary and secondary energy consumption, Portfolio Manager uses the convention of source EUIs. The source energy also accounts for losses incurred in production, storage, transmission, and delivery of energy to the site, which provide an equivalent measure for various types of buildings with differing energy sources. The results of the Portfolio Manager benchmarking tool are contained in the table below.

Building	Site EUI kBtu/ft <sup>2</sup> /yr	Source EUI Btu/ft <sup>2</sup> /yr	Energy Star Rating
			(1-100)
Franklin Ave Middle School	65	175	31

The Franklin Avenue middle School has an above average Energy Star rating of 66, with a score of 50 being the median score. By implementing the measures discussed in this report, it is expected that the EUI can be reduced and the score increased. By obtaining a score of 75 or better, the school would be eligible to receive the Energy Star Rating Certification.

The Portfolio Manager account can be accessed by entering the username and password shown below at the login screen of the Portfolio Manager website (<a href="https://www.energystar.gov/istar/pmpam/">https://www.energystar.gov/istar/pmpam/</a>). The account has been shared with the NYSERDABENCHMARKING master account.

Username: franklinlakesboe Password: energystar

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

The user name and password for the building's EPA Portfolio Manager Account has been provided to Michael Solokas, Business Administrator.

### 8.0 CONCLUSIONS & RECOMMENDATIONS

The LGEA energy audit conducted by CHA at the Franklin Avenue Middle School identified several potential ECMs. Recommended ECM's for premium efficiency motors and variable speed drives , demand control Ventilation , low flow plumbing fixtures, and lighting controls, can yield potential annual savings of \$9,800. A summary of the costs, savings, and paybacks are as follows:

ECM-4 Install VSDs and Premium Motors on HW Pumps

Budgetary		Aı	nnual Utility Sa		Estimated	Total		Potential	Payback	Payback	
Cost					Maintenance	Savings	ROI	Incentive*	(without	(with	
	Electricity Natural Gas Water T			Total	Savings				Incentive)	Incentive)	
\$	kW	kWh	Therms	Kgals	\$	\$	\$		\$	Years	Years
10,000	0	14,200	0	0	1,900	0	3,800	2.8	2,300	5.3	4.1

ECM-5 Demand Controlled Ventilation (DCV) (Gym & Cafeteria)

Budgetary		Aı	nnual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost				Maintenance	Savings	ROI	Incentive*	(without	(with		
	Electricity Natural Gas Water Total			Savings				Incentive)	Incentive)		
\$	kW	kWh	Therms	kGals	\$	\$	\$		\$	Years	Years
20,000	0	5,700	700	0	1,500	0	1,500	0.1	0	13.3	13.3

**ECM-9 Install Lighting Controls (Occupancy Sensors)** 

Budgetary		Anr	nual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost						Maintenance	Savings	ROI	Incentive*	(without	(with
	Ele	Natural Electricity Gas Water Total				Savings				Incentive)	Incentive)
\$	kW	kW kWh Therms kGals \$				\$	\$		\$	Years	Years
23,000	0	0 43,900 0 0 5,700					5,700	3.0	3,900	3.9	3.2

**ECM-11 Install Low Flow Plumbing** 

Budgetary		Aı	nnual Utility Sa	vings		Estimated	Total		Potential	Payback	Payback
Cost						Maintenance	Savings	ROI	Incentive*	(without	(with
	Electricity		Natural Gas	Water	Total	Savings				Incentive)	Incentive)
\$	kW	kWh	Therms	kGals	\$	\$	\$		\$	Years	Years
6,000	0	0	0	100	700	0	700	0.9	0	8.6	8.6

# APPENDIX A **Utility Usage Analysis** Third Party Energy Suppliers List **New Jersey BPU - Energy Audits**

# Franklin Lakes BOE 490 Pulis Ave, Franklin Lakes, NJ 07417

**Electric Service** 

Delivery - Orange & Rockland
Supplier - Direct Energy

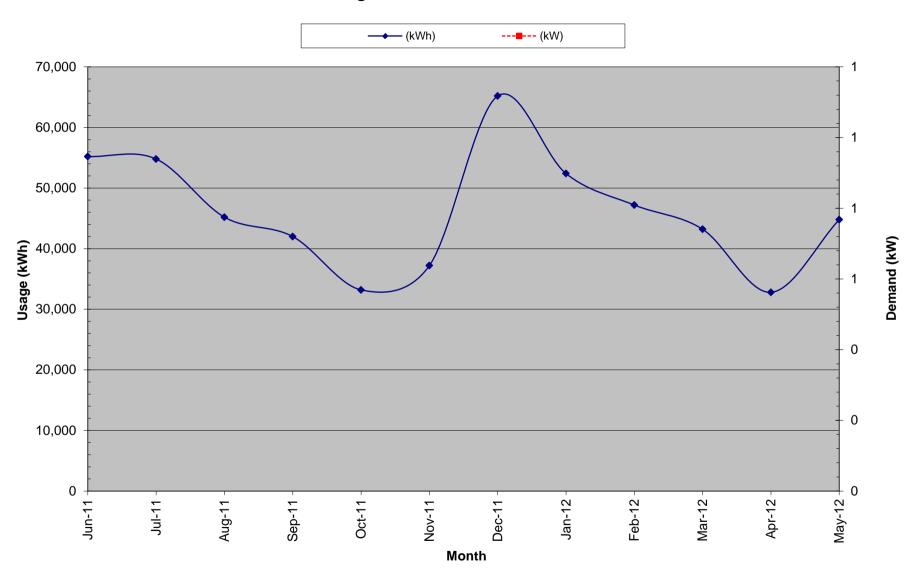
For Service at: Franklin Avenue Middle School - Heat

Account No.: 11915-62009 / 1065360

Meter No.: 081287813

			Charges				Unit Costs					
	Consumption	Demand	Total	Delivery	Supply	Blend	ded Rate	Cons	sumption	Demand		
Month	(kWh)	(kW)	(\$)	(\$)	(\$)	(\$/	/kWh)	(\$/	⁄kWh)	(\$/kW)		
June-11	55,200		\$8,580.81	\$2,936.61	\$5,644.20	\$	0.155	\$	0.155	#DIV/0!		
July-11	54,800		\$8,521.33	\$2,918.03	\$5,603.30	\$	0.155	\$	0.155	#DIV/0!		
August-11	45,200		\$7,033.49	\$2,411.79	\$4,621.70	\$	0.156	\$	0.156	#DIV/0!		
September-11	42,000		\$6,188.24	\$1,893.74	\$4,294.50	\$	0.147	\$	0.147	#DIV/0!		
October-11	33,200		\$4,672.55	\$1,277.85	\$3,394.70	\$	0.141	\$	0.141	#DIV/0!		
November-11	37,200		\$5,244.31	\$1,440.61	\$3,803.70	\$	0.141	\$	0.141	#DIV/0!		
December-11	65,200		\$8,162.70	\$2,490.30	\$5,672.40	\$	0.125	\$	0.125	#DIV/0!		
January-12	52,400		\$6,537.01	\$1,978.21	\$4,558.80	\$	0.125	\$	0.125	#DIV/0!		
February-12	47,200		\$5,888.29	\$1,781.89	\$4,106.40	\$	0.125	\$	0.125	#DIV/0!		
March-12	43,200		\$5,389.29	\$1,630.89	\$3,758.40	\$	0.125	\$	0.125	#DIV/0!		
April-12	32,800		\$4,091.91	\$1,238.31	\$2,853.60	\$	0.125	\$	0.125	#DIV/0!		
May-12	44,800		\$2,082.41	\$2,082.41		\$	0.046	\$	0.046	#DIV/0!		
Total (All)	553,200	0.0	\$72,392.34	\$24,080.64	\$48,311.70	\$	0.131	\$	0.131	#DIV/0!		

# **Electric Usage - Franklin Avenue Middle School - Heat**



# Franklin Lakes BOE 490 Pulis Ave, Franklin Lakes, NJ 07417

**Electric Service** 

Delivery - Orange & Rockland
Supplier - Direct Energy

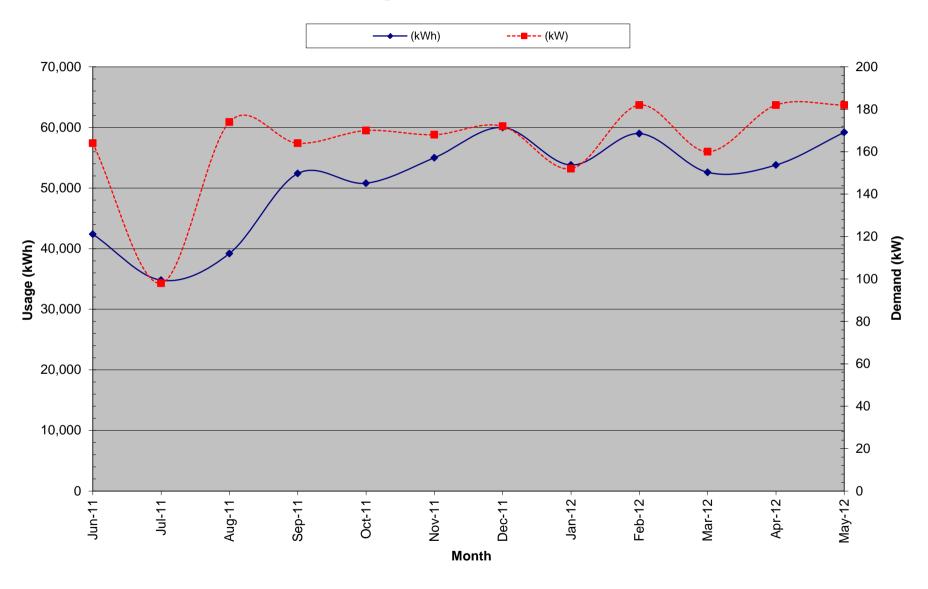
For Service at: Franklin Avenue Middle School

Account No.: 12125-62001 / 1065361

Meter No.: 095815014

				Charges				Unit	Costs		
	Consumption	Demand	Total	Delivery	Supply	Blen	ded Rate	Cons	sumption	De	emand
Month	(kWh)	(kW)	(\$)	(\$)	(\$)	(\$	/kWh)	(\$	/kWh)	(\$	S/kW)
June-11	42,400	164.0	\$6,803.75	\$2,468.35	\$4,335.40	\$	0.160	\$	0.146	\$	3.81
July-11	34,800	98.0	\$5,451.90	\$1,893.60	\$3,558.30	\$	0.157	\$	0.146	\$	3.73
August-11	39,200	174.0	\$6,388.56	\$2,380.36	\$4,008.20	\$	0.163	\$	0.146	\$	3.82
September-11	52,400	164.0	\$8,192.72	\$2,834.82	\$5,357.90	\$	0.156	\$	0.145	\$	3.51
October-11	50,800	170.0	\$7,949.25	\$2,754.95	\$5,194.30	\$	0.156	\$	0.146	\$	3.27
November-11	55,000	168.0	\$8,562.10	\$2,938.35	\$5,623.75	\$	0.156	\$	0.146	\$	3.27
December-11	60,000	172.0	\$8,351.98	\$3,131.98	\$5,220.00	\$	0.139	\$	0.130	\$	3.27
January-12	53,800	152.0	\$7,461.74	\$2,781.14	\$4,680.60	\$	0.139	\$	0.129	\$	3.26
February-12	59,000	182.0	\$8,230.69	\$3,097.69	\$5,133.00	\$	0.140	\$	0.129	\$	3.28
March-12	52,600	160.0	\$7,334.58	\$2,758.38	\$4,576.20	\$	0.139	\$	0.130	\$	3.26
April-12	53,800	182.0	\$7,562.91	\$2,882.31	\$4,680.60	\$	0.141	\$	0.129	\$	3.28
May-12	59,200	182.0	\$3,173.02	\$3,173.02		\$	0.054	\$	0.043	\$	3.59
Total (All)	613,000	182.0	\$85,463.20	\$33,094.95	\$52,368.25	\$	0.139	\$	0.128	\$	3.44

# **Electric Usage - Franklin Avenue Middle School**



# Franklin Lakes BOE 490 Pulis Ave, Franklin Lakes, NJ 07417

**Gas Service** 

Delivery - PSE&G

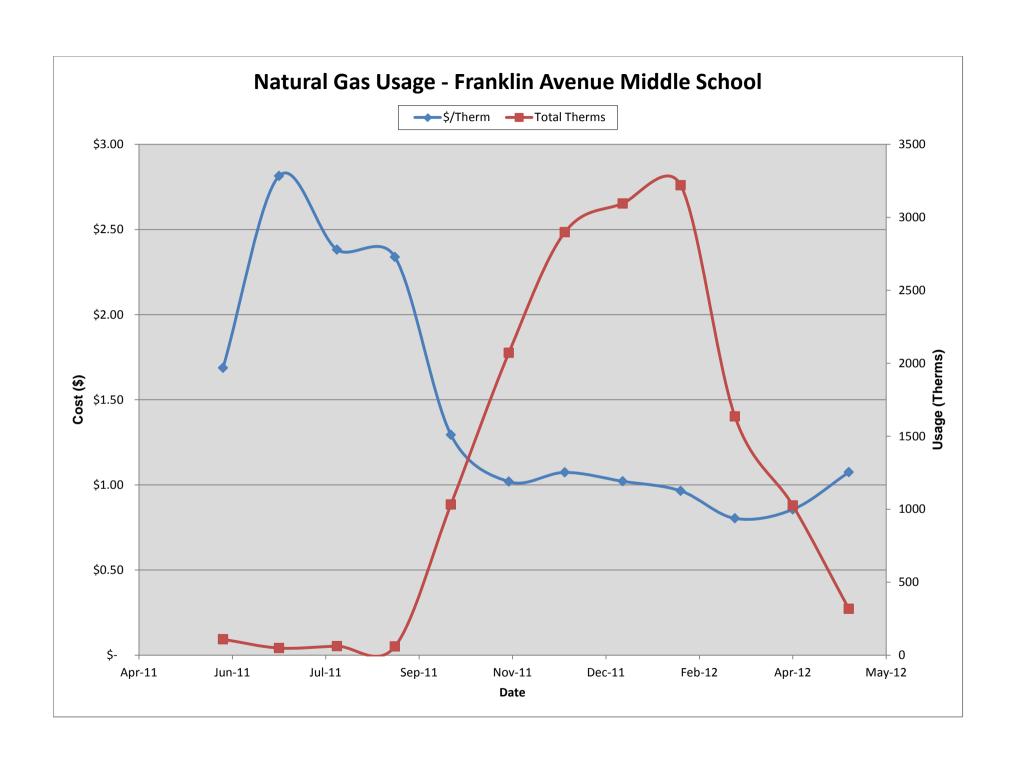
Supplier - Woodruff Energy / Hess

For Service at: Franklin Avenue Middle School

Account No.: 6516248702

Meter No.: 2643362 / 3637797

Month	Total (\$)		Delivery (\$)		Supply (\$)		Total Therms	\$/Therm
Jun-11	\$	183.25	\$	112.81	\$	70.44	108.598	\$ 1.69
Jul-11	\$	136.53	\$	105.19	\$	31.34	48.515	\$ 2.81
Aug-11	\$	145.35	\$	108.39	\$	36.96	61.022	\$ 2.38
Sep-11	\$	138.00	\$	108.10	\$	29.90	59.01	\$ 2.34
Oct-11	\$	1,335.53	\$	818.42	\$	517.11	1032.143	\$ 1.29
Nov-11	\$	2,110.78	\$	1,014.56	\$	1,096.22	2071.54	\$ 1.02
Dec-11	\$	3,110.47	\$	1,171.30	\$	1,939.17	2898.216	\$ 1.07
Jan-12	\$	3,159.91	\$	1,105.34	\$	2,054.57	3095.107	\$ 1.02
Feb-12	\$	3,106.37	\$	1,115.74	\$	1,990.63	3219.846	\$ 0.96
Mar-12	\$	1,314.06	\$	302.55	\$	1,011.51	1636.007	\$ 0.80
Apr-12	\$	877.72	\$	243.71	\$	634.01	1025.585	\$ 0.86
May-12	\$	340.26	\$	144.40	\$	195.86	316.755	\$ 1.07
Total	\$	15,958.23	\$	6,350.51	\$	9,607.72	15572.344	\$ 1.02

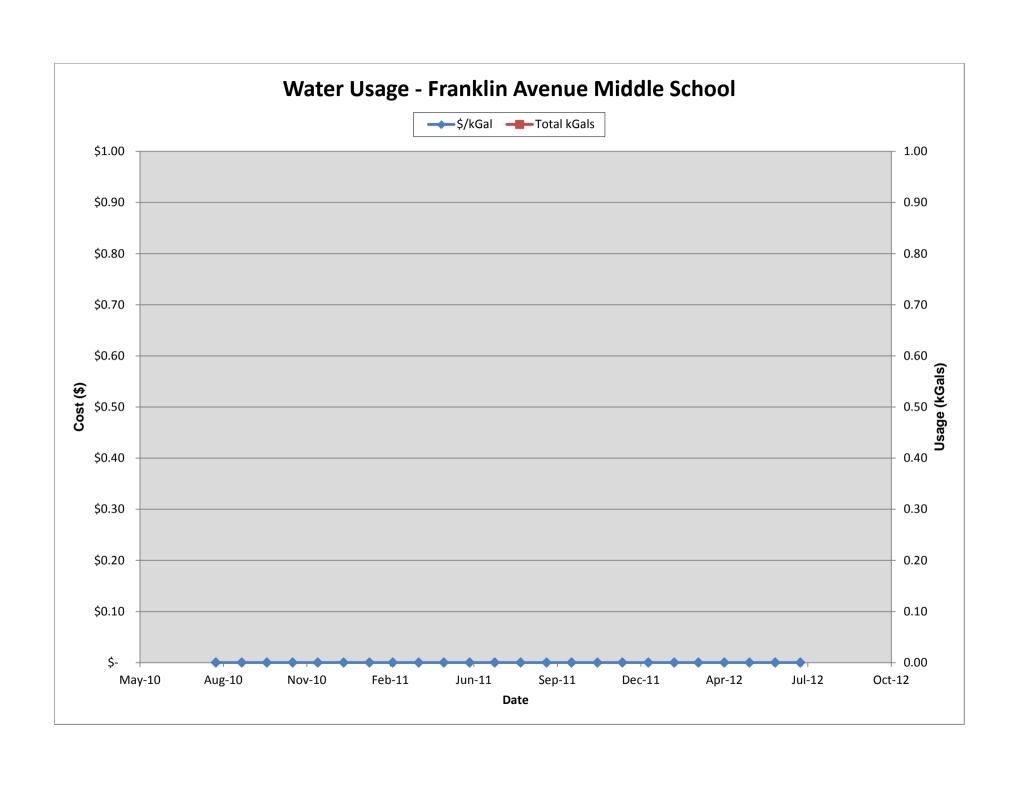


Franklin Lakes BOE 490 Pulis Ave, Franklin Lakes, NJ 07417 Water Service Delivery -Supplier -

For Service at: Franklin Avenue Middle School - Heat

Account No.: Meter No.:

Month	Total (\$)	Total kGals	\$/kGal
Aug-10			#DIV/0!
Sep-10			#DIV/0!
Oct-10			#DIV/0!
Nov-10			#DIV/0!
Dec-10			#DIV/0!
Jan-11			#DIV/0!
Feb-11			#DIV/0!
Mar-11			#DIV/0!
Apr-11			#DIV/0!
May-11			#DIV/0!
Jun-11			#DIV/0!
Jul-11			#DIV/0!
Aug-11			#DIV/0!
Sep-11			#DIV/0!
Oct-11			#DIV/0!
Nov-11			#DIV/0!
Dec-11			#DIV/0!
Jan-12			#DIV/0!
Feb-12			#DIV/0!
Mar-12			#DIV/0!
Apr-12			#DIV/0!
May-12			#DIV/0!
Jun-12			#DIV/0!
Jul-12			#DIV/0!
Total	-	0.00	#DIV/0!



# PSE&G ELECTRIC SERVICE TERRITORY

Last Updated: 10/24/12

# \*CUSTOMER CLASS - R - RESIDENTIAL C - COMMERCIAL I -INDUSTRIAL

	T. L. L	*0 4
Supplier	Telephone & Web Site	*Customer Class
AEP Energy, Inc.	(866) 258-3782	C/I
309 Fellowship Road, Fl. 2	www.aepenergy.com	ACTIVE
Mount Laurel, NJ 08054		
Alpha Gas and Electric, LLC	(855) 553-6374	R/C
641 5th Street	www.alphagasandelectric.com	ACTIVE
Lakewood, NJ 08701		11011/2
Ambit Northeast, LLC	(877)-30-AMBIT (877) 302-6248	R/C
103 Carnegie Center	www.ambitenergy.com	ACTIVE
Suite 300	<del></del>	1101112
Princeton, NJ 08540		
American Powernet	(877) 977-2636	C ACTIVE
Management, LP	www.americanpowernet.com	CHCIIVE
437 North Grove St.	www.manieriean.powernesie	
Berlin, NJ 08009		
Amerigreen Energy, Inc.	888-423-8357	R/C
1463 Lamberton Road	www.amerigreen.com	ACTIVE
Trenton, NJ 08611	www.amerigicen.com	HOHVE
AP Gas & Electric, LLC	(855) 544-4895	R/C/I
10 North Park Place, Suite 420	www.apge.com	ACTIVE
Morristown, NJ 07960	www.apgc.com	ACTIVE
Astral Energy LLC	(201) 384-5552	R/C/I
16 Tyson Place	www.astralenergyllc.com	ACTIVE
Bergenfield, NJ 07621	www.astraienergync.com	ACTIVE
	(888) 978-9974	C A CTIVE
Barclays Capital Services, Inc. 70 Hudson Street	· · · ·	C ACTIVE
Jersey City, NJ 07302-4585	www.group.barclays.com	
BBPC, LLC d/b/a Great	(888) 651-4121	C/I
Eastern Energy		ACTIVE
116 Village Blvd. Suite 200	www.greateasternenergy.com	ACTIVE
Princeton, NJ 08540		
	(877) 653-5090	DICH ACTIVE
Champion Energy Services, LLC	` /	R/C/I ACTIVE
72 Avenue L	www.championenergyservices.com	
Newark, NJ 07105	000 505 4400	7.10
Choice Energy, LLC	888-565-4490	R/C
4257 US Highway 9, Suite 6C	www.4choiceenergy.com	ACTIVE
Freehold, NJ 07728	(000) GLD JUDYY (000) 544 4500	7.107
Clearview Electric, Inc.	(888) CLR-VIEW (800) 746-4702	R/C/I
505 Park Drive	www.clearviewenergy.com	ACTIVE
Woodbury, NJ 08096	1 0 1 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	_
Commerce Energy, Inc.	1-866-587-8674	R
7 Cedar Terrace	www.commerceenergy.com	ACTIVE
Ramsey, NJ 07446		_
ConEdison Solutions	(888) 665-0955	C/I
Cherry Tree Corporate Center	www.conedsolutions.com	ACTIVE
535 State Highway		
Suite 180		
Cherry Hill, NJ 08002		
Constellation NewEnergy, Inc.	(866) 237-7693 www.constellation.com	R/C/I ACTIVE
900A Lake Street, Suite 2		
Ramsey, NJ 07446		

Constellation Engage	(877) 997-9995	R
Constellation Energy 900A Lake Street, Suite 2	www.constellation.com	ACTIVE
Ramsey, NJ 07446	www.constenation.com	ACTIVE
· · · · · · · · · · · · · · · · · · ·	(212) 529 2124	C
Credit Suisse, (USA) Inc.	(212) 538-3124	C
700 College Road East	www.creditsuisse.com	ACTIVE
Princeton, NJ 08450		
Direct Energy Business, LLC	(888) 925-9115	C/I
120 Wood Avenue, Suite 611	www.directenergybusiness.com	ACTIVE
Iselin, NJ 08830		
Direct Energy Services, LLC	(866) 348-4193	R
120 Wood Avenue, Suite 611	www.directenergy.com	ACTIVE
Iselin, NJ 08830		
Discount Energy Group, LLC	(800) 282-3331	R/C
811 Church Road, Suite 149	www.discountenergygroup.com	ACTIVE
Cherry Hill, New Jersey		
08002		
Dominion Retail, Inc. d/b/a Dominion Energy	(866) 275-4240	R/C
Solutions	www.dom.com/products	ACTIVE
395 Route #70 West		
Suite 125		
Lakewood, NJ 08701		
DTE Energy Supply, Inc.	(877) 332-2450	C/I ACTIVE
One Gateway Center,	www.dtesupply.com	C/IACIIVE
Suite 2600	www.dtcsuppry.com	
Newark, NJ 07102		
<u> </u>	(955) 242 7270	D/C/I
Energy.me Midwest LLC	(855) 243-7270	R/C/I
90 Washington Blvd	<u>www.energy.me</u>	ACTIVE
Bedminster, NJ 07921		
Energy Plus Holdings LLC	(877) 866-9193	R/C
309 Fellowship Road	www.energypluscompany.com	ACTIVE
East Gate Center, Suite 200		
Mt. Laurel, NJ 08054		
Ethical Electric Benefit Co. d/b/a Ethical Electric	(888) 444-9452 <u>www.ethicalelectric.com</u>	R/C ACTIVE
100 Overlook Center, 2nd Fl.		
Princeton, NJ 08540		
	(000) 077 0700	0.5
FirstEnergy Solutions	(800) 977-0500	C/I
300 Madison Avenue	www.fes.com	ACTIVE
Morristown, NJ 07962		
Gateway Energy Services	(800) 805-8586	R/C/I ACTIVE
Corp.	www.gesc.com	
44 Whispering Pines Lane		
Lakewood, NJ 08701		
GDF SUEZ Energy	(866) 999-8374	C/I
Resources NA, Inc.	www.gdfsuezenergyresources.com	ACTIVE
333 Thornall Street		
Sixth Floor		
Edison, NJ 08837		
Glacial Energy of New	(888) 452-2425	C/I
Jersey, Inc.	www.glacialenergy.com	ACTIVE
75 Route 15 Building E	www.gracialenergy.com	ACIIVE
Lafayette, NJ 07848		
	(000) 540 0770	O/E A C/PREZE
Global Energy Marketing	(800) 542-0778 <u>www.globalp.com</u>	C/I ACTIVE
LLC		
129 Wentz Avenue		
Springfield, NJ 07081		

Green Mountain Energy	(866) 767-5818	C/I
Company	www.greenmountain.com/commercial- home	ACTIVE
211 Carnegie Center Drive	www.greenmountam.com/commercial-	ACTIVE
Princeton, NJ 08540		
Hess Corporation	(800) 437-7872	C/I
1 Hess Plaza	www.hess.com	ACTIVE
Woodbridge, NJ 07095	www.ness.com	ACTIVE
	(888) 264-4908	R/C
HIKO Energy, LLC 655 Suffern Road	(888) 264-4908 www.hikoenergy.com	ACTIVE
Teaneck, NJ 07666	www.mkoenergy.com	ACTIVE
	(977) 200 7155	D/C/T
HOP Energy, LLC d/b/a Metro Energy, HOP	(877) 390-7155	R/C/I
Fleet Fueling, HOP Energy Fleet Fueling 1011 Hudson Avenue	www.hopenergy.com	ACTIVE
Ridgefield, NJ 07657		
Hudson Energy Services, LLC	(877) Hudson 9	C
7 Cedar Street	www.hudsonenergyservices.com	ACTIVE
Ramsey, New Jersey 07446		
IDT Energy, Inc.	(877) 887-6866	R/C
550 Broad Street	www.idtenergy.com	ACTIVE
Newark, NJ 07102	www.idtonorgy.com	ACIIVE
Independence Energy Group, LLC	(877) 235-6708	R/C ACTIVE
3711 Market Street, 10th Fl.	www.chooseindependence.com	N/C ACTIVE
Philadelphia, PA 19104	www.enoosemacpendence.com	
*	(877) 763-9977	СЛ
Integrys Energy Services, Inc. 99 Wood Ave, South, Suite		C/I ACTIVE
802	www.integrysenergy.com	ACTIVE
Iselin, NJ 08830		
<u>'</u>	(977) 707 9797	D/C/L A C/EIN/E
Keil & Sons, Inc.	(877) 797-8786 www.systrumenergy.com	R/C/I ACTIVE
<b>d/b/a Systrum Energy</b> 1 Bergen Blvd.		
Fairview, NJ 07022		
· · · · · · · · · · · · · · · · · · ·	(9.66) 7.60 2700	O/L A OFFITTE
Liberty Power Delaware, LLC	(866) 769-3799	C/I ACTIVE
1973 Highway 34, Suite 211	www.libertypowercorp.com	
Wall, NJ 07719	(0.44) = 40.0000	
Liberty Power Holdings, LLC	(866) 769-3799	C/I ACTIVE
1973 Highway 34, Suite 211	www.libertypowercorp.com	
Wall, NJ 07719	(000) 2/2 2/1/	
Linde Energy Services	(800) 247-2644	C/I
575 Mountain Avenue	www.linde.com	ACTIVE
Murray Hill, NJ 07974	(000) === ===	- 1~ -
Marathon Power LLC	( 888) 779-7255	R/C/I
302 Main Street	www.mecny.com	ACTIVE
Paterson, NJ 07505		
MXenergy Electric Inc.	(800) 785-4374	R/C/I
900 Lake Street	www.mxenergy.com	ACTIVE
Ramsey, NJ 07446		
NATGASCO, Inc.	(973) 678-1800 x. 251	R/C
532 Freeman St.	www.supremeenergyinc.com	ACTIVE
Orange, NJ 07050		
NextEra Energy Services	(877) 528-2890 Commercial	R/C/I
New Jersey, LLC	(800) 882-1276 Residential	ACTIVE
651 Jernee Mill Road	www.nexteraenergyservices.com	
Sayreville, NJ 08872		
New Jersey Gas & Electric	(866) 568-0290	R/C
1 Bridge Plaza fl. 2	www.NJGandE.com	ACTIVE
Fort Lee, NJ 07024		

(877) 273-6772	C/I
www.noblesolutions.com	ACTIVE
(888) 313-9086	R/C/I
` ′	ACTIVE
www.mapower.com	MOTIVE
(877) 726-5862	R/C/I
	ACTIVE
www.rameoEnergy.com	ACTIVE
(900) ENERGY 0 (262 7400)	C/T
	C/I
www.pepco-services.com	ACTIVE
	R/C/I
www.plymouthenergy.com	ACTIVE
(800) 281-2000	C/I
www.pplenergyplus.com	ACTIVE
(888) 354-4415	R/C/I
www.ppandu.com	ACTIVE
(877) 297-3795 (877) 297-3780	R/C/I ACTIVE
(888) 238-4041	R/C/I
	ACTIVE
	11011/2
(877) 973-7763	R/C/I
	ACTIVE
www.respondpower.com	ACTIVE
(800) 266 6020	C/I A C/EINE
	C/I ACTIVE
www.southjerseyenergy.com	
(000) 502 0002	TD / C//T
(888) 682-8082	R/C/I
	ACTIVE
	R/C
www.sjnaturalgas.com	ACTIVE
(800) 441-7514	R/C/I
•	ACTIVE
www.sparkenergy.com	
www.sparkenergy.com	
	C/I
(800) 225-1560 www.spragueenergy.com	
(800) 225-1560	C/I
(800) 225-1560 www.spragueenergy.com	C/I ACTIVE
(800) 225-1560 www.spragueenergy.com (800) 600-3040	C/I ACTIVE R/C/I
(800) 225-1560 www.spragueenergy.com	C/I ACTIVE
(800) 225-1560 www.spragueenergy.com  (800) 600-3040 www.starionenergy.com	C/I ACTIVE R/C/I ACTIVE
(800) 225-1560 www.spragueenergy.com (800) 600-3040	C/I ACTIVE R/C/I
	(888) 313-9086 www.napower.com  (877) 726-5862 www.PalmcoEnergy.com  (800) ENERGY-9 (363-7499) www.pepco-services.com  (855) 32-POWER (76937) www.plymouthenergy.com  (800) 281-2000 www.pplenergyplus.com  (888) 354-4415 www.ppandu.com  (877) 297-3795 (877) 297-3780 www.reliant.com/pjm  (888) 238-4041 http://rescomenergy.com  (877) 973-7763 www.respondpower.com  (800) 266-6020 www.southjerseyenergy.com  (888) 682-8082

UGI Energy Services, Inc. d/b/a GASMARK	(856) 273-9995	C/I
224 Strawbridge Drive	www.ugienergyservices.com	ACTIVE
Suite 107		
Moorestown, NJ 08057		
Verde Energy USA, Inc.	(800) 388-3862	R/C/I
50 East Palisades Avenue	www.lowcostpower.com	ACTIVE
Englewood, NJ 07631		
Viridian Energy	(866) 663-2508	R/C/I
2001 Route 46, Waterview	www.viridian.com	ACTIVE
Plaza		
Suite 310		
Parsippany, NJ 07054		
Xoom Energy New Jersey, LLC	(888) 997-8979	R/C/I
744 Broad Street	www.xoomenergy.com	ACTIVE
Newark, NJ 07102		
YEP Energy	(855) 363-7736	R/C/I
89 Headquarters Plaza North	www.yepenergyNJ.com	ACTIVE
#1463		
Morristown, NJ 07960		
Your Energy Holdings, LLC One International	(855) 732-2493	R/C/I
Boulevard Suite 400	www.thisisyourenergy.com	ACTIVE
Mahwah, NJ 07495-0400		

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#### PSE&G GAS SERVICE TERRITORY

Last Updated: 10/24/12

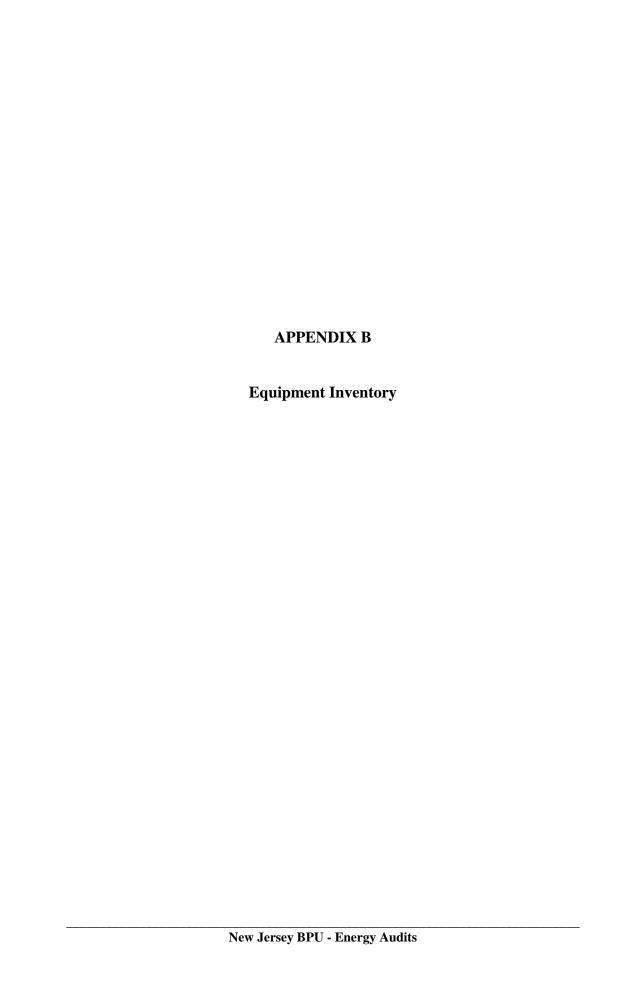
\*CUSTOMER CLASS - R - RESIDENTIAL C - COMMERCIAL I - INDUSTRIAL

Supplier	Telephone	*Customer
	& Web Site	Class
Ambit Northeast, LLC	(877)-30-AMBIT (877)	R/C
03 Carnegie Center	302-6248	ACTIVE
Suite 300	www.ambitenergy.com	
Princeton, NJ 08540		
Astral Energy LLC	888-850-1872	R/C/I
6 Tyson Place	www.astralenergyllc.com	ACTIVE
Bergenfield, NJ 07621		
BBPC, LLC Great Eastern Energy	888-651-4121	C/I
16 Village Blvd. Suite 200	www.greateasternenergy.com	ACTIVE
Princeton, NJ 08540		
Clearview Electric Inc. d/b/a Clearview Gas	800-746-4720	R/C
744 Lexington Ave.	www.clearviewenergy.com	ACTIVE
Pennsauken, NJ 08110		
Colonial Energy, Inc.	845-429-3229	C/I
33 Harding Road	www.colonialgroupinc.com	ACTIVE
Vyckoff, NJ 07481	<u></u>	11011,2
Commerce Energy, Inc.	(888) 817-8572	R
Cedar Terrace	www.commerceenergy.com	ACTIVE
Ramsey, NJ 07746	www.commercentergy.com	ACTIVE
Compass Energy Services, Inc.	866-867-8328	C/I
1085 Morris Avenue, Suite 150	908-638-6605	ACTIVE
Union, NJ 07083		ACTIVE
Union, NJ 07083	www.compassenergy.net	
ConocoPhillips Company	800-646-4427	C/I ACTIVE
224 Strawbridge Drive, Suite 107	www.conocophillips.com	
Moorestown, NJ 08057		
Consolidated Edison Energy, Inc. d/b/a Con Edison	888-686-1383 x2130	
Solutions	www.conedenergy.com	
535 State Highway 38, Suite 140		
Cherry Hill, NJ 08002		
Consolidated Edison Solutions, Inc.	888-665-0955	C/I ACTIVE
Cherry Tree Corporate Center	www.conedsolutions.com	
535 State Highway 38, Suite 140	<u></u>	
Cherry Hill, NJ 08002		
Constellation NewEnergy-Gas	(800) 900-1982	C/I
Division, LLC	www.constellation.com	ACTIVE
900A Lake Street, Suite 2	<u>www.constenation.com</u>	ACTIVE
Ramsey, NJ 07466	000 005 0115	C/T
Direct Energy Business, LLC	888-925-9115	C/I
120 Wood Avenue, Suite 611	www.directenergy.com	ACTIVE
Iselin, NJ 08830	000000000000000000000000000000000000000	
Direct Energy Services, LLP	866-348-4193	R
120 Wood Avenue, Suite 611	www.directenergy.com	ACTIVE
Iselin, NJ 08830		
Gateway Energy Services Corp.	800-805-8586	R/C/I
44 Whispering Pines Lane	www.gesc.com	ACTIVE
Lakewood, NJ 08701		
UGI Energy Services, Inc. d/b/a GASMARK	856-273-9995	C/I
224 Strawbridge Drive, Suite 107	www.ugienergyservices.com	ACTIVE
Moorestown, NJ 08057		<u>                                      </u>
Global Energy Marketing, LLC	800-542-0778	C/I
129 Wentz Avenue	www.globalp.com	ACTIVE
Springfield, NJ 07081		
Great Eastern Energy	888-651-4121 www.greateastern.com	C/I ACTIVE
116 Village Blvd., Suite 200	groutousterm.com	

Greenlight Energy	718-204-7467	С
330 Hudson Street, Suite 4	www.greenlightenergy.us	ACTIVE
Hoboken, NJ 07030	www.greeniightenergy.us	ACTIVE
Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095	800-437-7872	C/I
Tress Energy, Inc. One riess raza wooddrage, NJ 07093	www.hess.com	ACTIVE
Hess Small Business Services, LLC	888-494-4377	C/I
One Hess Plaza	www.hessenergy.com	ACTIVE
Woodbridge, NJ 07095	www.nessenergy.com	ACIIVE
HIKO Energy, LLC	(888) 264-4908	R/C
655 Suffern Road	www.hikoenergy.com	ACTIVE
Teaneck, NJ 07666	www.mkoonergy.com	1101112
Hudson Energy Services, LLC	877- Hudson 9	С
7 Cedar Street	www.hudsonenergyservices.com	ACTIVE
Ramsey, NJ 07446	- www.madsonenergyservices.com	1101112
IDT Energy, Inc.	877-887-6866	R/C
550 Broad Street	www.idtenergy.com	ACTIVE
Newark, NJ 07102	gj.tosii	1101112
Integrys Energy Services – Natural	800-536-0151	C/I
Gas, LLC	www.integrysenergy.com	ACTIVE
99 Wood Avenue South		- · · <del>-</del>
Suite #802		
Iselin, NJ 08830		
Intelligent Energy	800-927-9794	R/C/I
2050 Center Avenue, Suite 500	www.intelligentenergy.org	ACTIVE
Fort Lee, NJ 07024		
Keil & Sons, Inc.	1-877-797-8786	R/C/I
d/b/a Systrum Energy	www.systrumenergy.com	ACTIVE
1 Bergen Blvd.		
Fairview, NJ 07022		
Major Energy Services, LLC	888-625-6760	R/C/I
10 Regency CT	www.majorenergy.com	ACTIVE
Lakewood, NJ 08701		
Marathon Power LLC	888-779-7255	R/C/I
302 Main Street	www.mecny.com	ACTIVE
Paterson, NJ 07505		
Metromedia Energy, Inc.	800-828-9427	C
6 Industrial Way	www.metromediaenergy.com	ACTIVE
Eatontown, NJ 07724		
Metro Energy Group, LLC	888-53-Metro	R/C
14 Washington Place	www.metroenergy.com	ACTIVE
Hackensack, NJ 07601		
MxEnergy, Inc.	800-758-4374 <u>www.mxenergy.com</u>	R/C/I
900 Lake Street		ACTIVE
Ramsey, NJ 07446		
NATGASCO (Mitchell Supreme)	800-840-4GAS	C
532 Freeman Street	www.natgasco.com	ACTIVE
Orange, NJ 07050		
New Energy Services LLC	800-660-3643	R/C/I
101 Neptune Avenue	www.newenergyservicesllc.com	ACTIVE
Deal, New Jersey 07723		
New Jersey Gas & Electric	866-568-0290	R/C
1 Bridge Plaza, Fl. 2	www.NJGandE.com	ACTIVE
Fort Lee, NJ 07024		
Noble Americas Energy Solutions	877-273-6772	C/I
The Mac-Cali Building	www.noblesolutions.com	ACTIVE
581 Main Street, 8th fl. Woodbridge, NJ 07095		
North American Power & Gas, LLC d/b/a North	(888) 313-9086	R/C/I
American Power	www.napower.com	ACTIVE
197 Route 18 South Ste. 3000		
East Brunswick, NJ 08816		

Palmco Energy NJ, LLC	877-726-5862	R/C/I
One Greentree Centre	www.PalmcoEnergy.com	ACTIVE
10,000 Lincoln Drive East, Suite 201		
Marlton, NJ 08053		
Pepco Energy Services, Inc.	800-363-7499	C/I
112 Main Street	www.pepco-services.com	ACTIVE
Lebanon, NJ 08833		
Plymouth Rock Energy, LLC	855-32-POWER (76937)	R/C/I
338 Maitland Avenue	www.plymouthenergy.com	ACTIVE
Teaneck, NJ 07666	······prymounieregyreom	1101112
PPL EnergyPlus, LLC	800-281-2000	C/I
811 Church Road - Office 105	www.pplenergyplus.com	ACTIVE
Cherry Hill, NJ 08002	······ppienergyprasicom	11011/2
Respond Power LLC	(877) 973-7763	R/C/I
10 Regency CT	www.respondpower.com	ACTIVE
Lakewood, NJ 08701	www.responapower.com	Henve
South Jersey Energy Company	800-266-6020	C/I
1 South Jersey Plaza, Route 54	www.southjerseyenergy.com	ACTIVE
Folsom, NJ 08037	www.southjerseyenergy.com	Henve
S.J. Energy Partners, Inc.	800-695-0666	R/C
208 White Horse Pike, Suite 4	www.sjnaturalgas.com	ACTIVE
Barrington, NJ 08007	www.sjnatururgus.com	Henve
Spark Energy Gas, L.P.	800-411-7514	R/C/I
2105 CityWest Blvd, Ste 100	www.sparkenergy.com	ACTIVE
Houston, Texas 77042	www.sparkenergy.com	Henve
Sprague Energy Corp.	855-466-2842	C/I
12 Ridge Road	www.spragueenergy.com	ACTIVE
Chatham Township, NJ 07928	www.sprugueenergy.com	Henve
Stuyvesant Energy LLC	800-640-6457	С
10 West Ivy Lane, Suite 4	www.stuyfuel.com	ACTIVE
Englewood, NJ 07631	www.stayraon.com	l licity E
Stream Energy New Jersey, LLC	(973) 494-8097 www.streamenergy.net	R/C ACTIVE
309 Fellowship Road	(973) 494 6097 www.streamenergy.net	NO NOTIVE
Suite 200		
Mt. Laurel, NJ 08054		
Systrum Energy	877-797-8786	R/C/I
1 Bergen Blvd.	www.systrumenergy.com	ACTIVE
Fairview, NJ 07022	www.systrumenergy.com	11011112
Woodruff Energy	800-557-1121	R/C/I
73 Water Street	www.woodruffenergy.com	ACTIVE
Bridgeton, NJ 08302		
Woodruff Energy US LLC	856-455-1111	C/I
73 Water Street, P.O. Box 777	800-557-1121	ACTIVE
Bridgeton, NJ 08302	www.woodruffenergy.com	
Xoom Energy New Jersey, LLC	888-997-8979	R/C/I
744 Broad Street	www.xoomenergy.com	ACTIVE
Newark, NJ 07102		
Your Energy Holdings, LLC One International Boulevard	(855) 732-2493	R/C/I
Suite 400	www.thisisyourenergy.com	ACTIVE
Mahwah, NJ 07495-0400	" " " " " " " " " " " " " " " " " " "	
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Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size /Efficiency Location		Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
B-1, B-2, B-3	3	A.O. Smith	LB 1000	#1: K95 29370, #2: J95 28995, #3 k95 29333	Heating / Natural Gas	Input: 1,000,000 BTU, Output: 900,000 BTU, 90% efficiency	Mech Room	School	1995	7	Good Condition
DWH	1	Rheem	G100-200A	URNG0610G009 0	Heating / Natural Gas	Input: 199,900, 100 gallons, 80%	Mech Room	School	2010	8	Good Condition
P-1, P-2, P-3	3	B&G	Series 60	-	Heating / Electric	1725 RPM, 1 HP, standard	Mech Room	School	1995	-	Good Condition
P-5, P-6	2	Taco	FE2508E2F1F2LOA	-	Heating / Electric	7.5 HP, 1800 RPM, 85.5% efficiency	Mech Room	School	1995	-	Good Condition
UH-1	1	McQuay	UHH034BJ	61337604	Heating / Natural Gas	1/20HP motor	Mech Room	Mech Room	1995	-	Good Condition
UV	31	Airedale	CMX-4	PA3012-U19886	HVAC / Electric DX	-	Classrooms	Classrooms	2005	13	Good Condition
HP-205	1	Carrier	50JQ008631QA	3695G30356	HVAC / Electric DX	-	Roof	210	2005	13	Good Condition
HP-204	1	Carrier	50JQ008631QA	3695G30357	HVAC / Electric DX	-	Roof	208	2005	13	Good Condition
	2	Reznor	RGB225-5MVJ	EARD66K1N1830 0ZMV4	HVAC / Natural Gas	-	Roof	Vestibules	2005	13	Good Condition
CU-1	1	Sanyo	CL1872	84793	HVAC / Electric DX	2-ton	Roof	Weight Room	2009	17	Good Condition
	1	Carrier	50JQ008631AA	3495G30490	HVAC / Electric DX	-	Roof	206/202	2005	13	Good Condition
AHU-1, AHU-2	2	McQuay	RD5708BY	#1: 35L0067503, #2: 35L0067403	HVAC / Electric DX	-	Roof	Cafeteria / Stage	2005	13	Good Condition
	1	McQuay	ALP027C	#1: 55L8505201, #2: 55L8505101	HVAC / Electric DX	26.2 tons	Roof	-	2005	13	Good Condition
HP-106	1	Carrier	50JQ004641QA	3595G20785	HVAC / Electric DX	-	Roof	119	2005	13	Good Condition
HP-105	1	Carrier	50JQ006641AA	3695G20224	HVAC / Electric DX	-	Roof	113	2005	13	Good Condition
HP-107	1	Carrier	50JQ004641QA	3595G20786	HVAC / Electric DX	-	Roof	122	2005	13	Good Condition
HP-104	1	Carrier	50JQ012631AA	3495G30489	HVAC / Electric DX	-	Roof	114	2005	13	Good Condition
HP-108	1 1	Carrier	50JQ006641AA	3695G20223	HVAC / Electric DX	-	Roof Roof	135	2005 2005	13	Good Condition Good Condition
HP-109 HP-102	1	Carrier Carrier	50JQ008631QA 50JQ004541QA	3695G30358 3595G20787	HVAC / Electric DX HVAC / Electric DX	-	Roof	Main Office	2005	13 13	Good Condition
HP-202	1	Carrier	50JQ004541QA 50JQ012631AA	3495G30488	HVAC / Electric DX	-	Roof	_	2005	13	Good Condition
HP-206	1	Carrier	50PQ016610AA	4495F76981	HVAC / Electric DX	-	Roof	Library	2005	13	Good Condition
HP-103	1	Carrier	50JQ008631QA	2495G30549	HVAC / Electric DX	-	Roof	153 / 154	2005	13	Good Condition
HP-201	1	Carrier	50JQ012631AA	3495G30491	HVAC / Electric DX		Roof	225 Computer Lab	2005	13	Good Condition
HP-101	1	Carrier	50JQ006641AA	3695G20222	HVAC / Electric DX	-	Roof	148	2005	13	Good Condition
	1	lennox	62K64-01	8303G00219	HVAC / Electric DX	-	Roof	TV Studio	2005	13	Good Condition
AHU-3	1	McQuay	RDS708BY	35L00676 03	HVAC / Electric DX	-	Roof	Hallways / Common Area	2005	13	Good Condition
HV-1, HV-2	1	Trane	CLDB08AN0C	#1: K82G64667, #2: K82G64666	HVAC / Electric DX	-	Roof	Gym	2005	13	Good Condition

Cost of Electricity:

\$0.107 \$/kWh \$6.74 \$/kW

_					EXISTING	CONDITIO	NS		_			
	Area Description	Usage	No. of Fixtures		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		"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	Boiler Room	Boiler Room	4	S 32 P F 2 (ELE)	F42LL	60	0.24	SW	2000	SW	480	1
201	112 Classrom	Classrooms	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	C-OCC	2400	C-OCC	1,944	2
258	112 Classrom	Classrooms	3	CFQ13W	CFQ13/2-L	28	0.08	C-OCC	2400	C-OCC	202	3
201	107 Storage	Storage Areas	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	1000	C-OCC	90	4
13	Elec	Mechanical Room		S 32 P F 2 (ELE)	F42LL	60	0.24	SW	1000	SW	240	5
199	Boy's TR	Bath Room		W 32 C F 1 (ELE)	F41LL	32	0.03	SW	2000	C-OCC	64	6
199	Girl's TR	Bath Room		W 32 C F 1 (ELE)	F41LL	32	0.03	SW	2000	C-OCC	64	7
201	106 Storage	Storage Areas	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.18	C-OCC	1000	C-OCC	180	8
201	106 IDF Room	Offices	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	C-OCC	2400	C-OCC	216	9
201	New Wing Corridor	Hallways	13	T 32 R F 3 (ELE)	F43ILL/2	90	1.17	SW	2280	C-OCC	2,668	10
256	Gym	Gynasium	30	T 32 R F 5 (ELE)	F45ILL	148	4.44	SW SW	2000	C-0CC	8,880	11
198 254	Gym 210 Science	Gynasium Classrooms	24	2T 17 R F 2 (ELE) REFLECTOR T 32 R F 4 (ELE)	F22LL F44LL	31 118	0.19 2.83	C-OCC	2000 2400	C-OCC	372 6,797	
254	210 Science Prep	Classrooms	24	` '			0.47	SW			·	13
234	Vivarium	Classrooms	4	T 32 R F 4 (ELE)	F44LL	118	0.24	SW	2400 2400	C-OCC	1,133 576	14
254	208 Science	Classrooms	22	2T 32 R F 2 (u) (ELE) Thin Tube T 32 R F 4 (ELE)	FU2LL F44LL	60 118	2.60	C-OCC	2400	C-OCC	6,230	16
254	Boy's TR	Bath Room	2	T 32 R F 4 (ELE)	F44LL	118	0.24	SW	2000	C-OCC	472	17
7	Boy's TR	Bath Room		2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2000	C-OCC	120	18
55	Corridor	Hallways		2T 17 R F 3 (ELE)	F23ILL	47	0.28	SW	2280	C-OCC	643	10
55	Corridor	Hallways		2T 17 R F 3 (ELE)	F23ILL	47	0.56	SW	2280	C-OCC	1,286	20
258	Corridor	Hallways	5	CFQ13W	CFQ13/2-L	28	0.14	SW	2280	C-OCC	319	21
13	Girl's TR	Bath Room	4	S 32 P F 2 (ELE)	F42LL	60	0.14	SW	2000	C-OCC	480	22
201	206 SGI	Classrooms	7	T 32 R F 3 (ELE)	F43ILL/2	90	0.63	C-OCC	2400	C-OCC	1,512	23
13	Girl's TR	Bath Room	8	S 32 P F 2 (ELE)	F42LL	60	0.48	SW	2000	C-OCC	960	24
13	Boy's TR	Bath Room	8	S 32 P F 2 (ELE)	F42LL	60	0.48	SW	2000	C-OCC	960	25
13	Cust Closet	Storage/Janitor	1	S 32 P F 2 (ELE)	F42LL	60	0.06	SW	500	SW	30	26
254	Storage	Storage Areas	4	T 32 R F 4 (ELE)	F44LL	118	0.47	SW	1000	C-OCC	472	27
201	202 SGI	Classrooms	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.45	C-OCC	2400	C-OCC	1,080	28
7	202 SGI	Classrooms	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	C-OCC	2400	C-OCC	144	29
201	213 Classroom	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	2400	C-OCC	2,592	30
201	214 Classroom	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	2400	C-OCC	2,592	31
254	Sprinkler Room	Mechanical Room	1	T 32 R F 4 (ELE)	F44LL	118	0.12	SW	1000	SW	118	32
257	231 Library	Classrooms	60	CFT40W	CFT40/2-BX	72	4.32	SW	2400	C-OCC	10,368	33
7	231 Library	Classrooms	20	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	1.20	SW	2400	C-OCC	2,880	34
199	231 Library	Classrooms	6	W 32 C F 1 (ELE)	F41LL	32	0.19	SW	2400	C-OCC	461	35
257	227 Tech Service Lab	Offices	4	CFT40W	CFT40/2-BX	72	0.29	SW	2400	C-OCC	691	36
254	Copy Room	Offices	27	T 32 R F 4 (ELE)	F44LL	118	3.19	SW	2400	C-OCC	7,646	37
257	230 Team Planning	Offices	5	CFT40W	CFT40/2-BX	72	0.36	SW	2400	C-OCC	864	38
254	Network	Storage/Janitor	2	T 32 R F 4 (ELE)	F44LL	118	0.24	SW	500	SW	118	39
55	Corridor	Hallways	6	2T 17 R F 3 (ELE)	F23ILL	47	0.28	SW	2280	C-OCC	643	40
254	226 Office	Offices	2	T 32 R F 4 (ELE)	F44LL	118	0.24	C-OCC	2400	C-OCC	566	41
13	224 Computer Lab	Classrooms	24	S 32 P F 2 (ELE)	F42LL	60	1.44	SW	2400	C-OCC	3,456	42
13	225 Computer Lab	Classrooms	24	S 32 P F 2 (ELE)	F42LL	60	1.44	SW	2400	C-OCC	3,456	43
201	216 Classroom	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	2400	C-OCC	2,592	44
201	217 Classroom	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	2400	C-OCC	2,592	45
201	219 Classroom	Classrooms	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	C-OCC	2400	C-OCC	1,944	46
55	219 Classroom	Classrooms	3	2T 17 R F 3 (ELE)	F23ILL	47	0.14	C-OCC	2400	C-OCC	338	47
201	220 Classroom	Classrooms	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	C-OCC	2400	C-OCC	1,944	48
55	220 Classroom	Classrooms	3	2T 17 R F 3 (ELE)	F23ILL	47	0.14	C-OCC	2400	C-OCC	338	49
201	221 Classroom	Classrooms	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	C-OCC	2400	C-OCC	1,944	50

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Cost of Electricity:

\$0.107 \$/kWh \$6.74 \$/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		"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
55	221 Classroom	Classrooms	3	2T 17 R F 3 (ELE)	F23ILL	47	0.14	C-OCC	2400	C-OCC	338	51
201	222 Classroom	Classrooms	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	C-OCC	2400	C-OCC	1,944	52
55	222 Classroom	Classrooms		2T 17 R F 3 (ELE)	F23ILL	47	0.14	C-OCC	2400	C-OCC	338	53
7	Corridor	Hallways	10	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.60	SW	2280	C-OCC	1,368	54
55	Corridor	Hallways	6	2T 17 R F 3 (ELE)	F23ILL	47	0.28	SW	2280	C-OCC	643	55
201	223 Classroom 224 Classroom	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	2400	C-OCC	2,592	56 57
201 201	236 TV Studio	Classrooms Classrooms	12	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90	1.08 0.99	C-OCC SW	2400 2400	C-OCC SW	2,592 2,376	57
258	235 Control Room	Classrooms	12	CFQ13W	CFQ13/2-L	28	0.34	SW	2400	C-OCC	806	50
258	235 Control Room	Classrooms	3	CFQ13W	CFQ13/2-L	28	0.08	SW	2400	C-OCC	202	60
220	Cust Closet	Storage/Janitor	1	S 17 C F 1(ELE)	F21ILL	20	0.02	SW	500	C-OCC	10	61
220	204 Elec	Mechanical Room		S 17 C F 1(ELE)	F21ILL	20	0.02	SW	1000	C-OCC	20	62
201	237 Classroom	Classrooms	15	T 32 R F 3 (ELÉ)	F43ILL/2	90	1.35	C-OCC	2400	C-OCC	3,240	63
201	238 Classroom	Bath Room	25	T 32 R F 3 (ELE)	F43ILL/2	90	2.25	C-OCC	2000	C-OCC	4,500	64
254	Art Office	Offices	1	T 32 R F 4 (ELE)	F44LL	118	0.12	SW	2400	C-OCC	283	65
254	Art Storage	Storage Areas	1	T 32 R F 4 (ELE)	F44LL	118	0.12	SW	1000	C-OCC	118	66
13	Stairs	Hallways	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2280	C-OCC	274	67
201	Stairs	Hallways	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2280	C-OCC	205	68
254	165 Woodshop	Classrooms	22	T 32 R F 4 (ELE)	F44LL	118	2.60	SW	2400	C-OCC	6,230	69
7	165 Woodshop	Classrooms	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2400	C-OCC	144	70
254	Finishing Room	Classrooms	2	T 32 R F 4 (ELE)	F44LL	118	0.24	SW	2400	C-OCC	566	71
55	Corridor	Hallways	9	2T 17 R F 3 (ELE)	F23ILL	47	0.42	SW	2280	C-OCC	964	72
258	Corridor	Hallways	10	CFQ13W	CFQ13/2-L	28	0.28	SW	2280	C-OCC	638	73
201	164 Science	Classrooms	25	T 32 R F 3 (ELE)	F43ILL/2	90	2.25	C-OCC	2400	C-OCC	5,400	74 75
201	164 Office Faculty TR	Offices Bath Room	4	T 32 R F 3 (ELE)	F43ILL/2 F23ILL	90	0.36 0.05	SW SW	2400 2000	C-OCC	864 94	
55 55	Storage	Storage Areas	1 1	2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE)	F23ILL	47	0.05	SW	1000	C-OCC	47	77
254	Cust Office	Offices	2	T 32 R F 4 (ELE)	F44LL	118	0.03	C-OCC	2400	C-OCC	566	78
201	162 Classroom	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	2400	C-OCC	2,592	79
201	161 Classroom	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	2400	C-OCC	2,592	80
201	148 Classroom	Classrooms	11	T 32 R F 3 (ELE)	F43ILL/2	90	0.99	C-OCC	2400	C-OCC	2,376	
201	Stairs	Hallways	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2280	C-OCC	205	82
13	Stairs	Hallways	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2280	C-OCC	274	83
201	144 Classroom	Classrooms	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	C-OCC	2400	C-OCC	1,944	84
55	144 Classroom	Classrooms	3	2T 17 R F 3 (ELÉ)	F23ILL	47	0.14	C-OCC	2400	C-OCC	338	85
201	143 Classroom	Classrooms	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	C-OCC	2400	C-OCC	1,944	86
55	143 Classroom	Classrooms	3	2T 17 R F 3 (ELE)	F23ILL	47	0.14	C-OCC	2400	C-OCC	338	87
258	Corridor	Hallways	12	CFQ13W	CFQ13/2-L	28	0.34	SW	2280	C-OCC	766	88
55	Corridor	Hallways	10	2T 17 R F 3 (ELE)	F23ILL	47	0.47	SW	2280	C-OCC	1,072	89
201	142 Classroom	Classrooms	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	C-OCC	2400	C-OCC	1,944	90
55	142 Classroom	Classrooms	3	2T 17 R F 3 (ELE)	F23ILL	47	0.14	C-OCC	2400	C-OCC	338	91
201	141 Classroom	Classrooms	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	C-OCC	2400	C-OCC	1,944	92 93
55 201	141 Classroom Stairs	Classrooms Hallways	3	2T 17 R F 3 (ELE) T 32 R F 3 (ELE)	F23ILL	47	0.14	C-OCC SW	2400 2280	C-0CC	338 205	93
55	Stairs	Hallways Hallways	1 2	2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	90	0.09	SW	2280	C-OCC	205	94 95
55	Nurse Waiting	Offices	6	2T 17 R F 3 (ELE)	F23ILL	47	0.09	SW	2400	C-OCC	677	95
55	147 Nurse Office	Offices	2	2T 17 R F 3 (ELE)	F23ILL	47	0.09	SW	2400	C-OCC	226	97
13	Exam	Exam		S 32 P F 2 (ELE)	F42LL	60	0.09	SW	3000	C-OCC	360	
257	Cot Area	Exam	8	CFT40W	CFT40/2-BX	72	0.58	SW	3000	C-OCC	1,728	99
7	TR	Bath Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2000	C-OCC	120	

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Cost of Electricity:

\$0.107 \$/kWh \$6.74 \$/kW

_				EXISTING CONDITIONS								
	Area Description	Usage	No. of Fixtures		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		"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
55	Corridor	Hallways	5	2T 17 R F 3 (ELE)	F23ILL	47	0.24	SW	2280	C-OCC	536	101
257	Main Office	Offices	11	CFT40W	CFT40/2-BX	72	0.79	SW	2400	C-OCC	1,901	102
257	135 Assist Prinicpal	Offices	10	CFT40W	CFT40/2-BX	72	0.72	SW	2400	C-OCC	1,728	103
257	138 Principal	Offices	3	CFT40W	CFT40/2-BX	72	0.22	SW	2400	C-OCC	518	104
258	138 Principal	Offices	3	CFQ13W	CFQ13/2-L	28	0.08	SW	2400	C-OCC	202	105
55	Vest	Hallways	4	2T 17 R F 3 (ELE)	F23ILL	47	0.19	SW	2280	C-OCC	429	106
257	131 Guidance	Offices	4	CFT40W	CFT40/2-BX	72	0.29	SW	2400	C-OCC	691	107
254	134 Workroom	Offices	4	T 32 R F 4 (ELE)	F44LL	118	0.47	SW	2400	C-OCC	1,133	108
257	130 Guidance	Offices	4	CFT40W	CFT40/2-BX	72	0.29	SW	2400	C-OCC	691	109
7	Women's TR	Bath Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2000	C-OCC	120	110
7	Men's TR	Bath Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2000	C-OCC	120	111
257	135 Office	Offices	6	CFT40W	CFT40/2-BX	72	0.43	SW	2400	C-OCC	1,037	112
257	Child Study Room	Offices	11	CFT40W	CFT40/2-BX	72	0.79	SW	2400	C-OCC	1,901	113
257	129 Child Study Team	Offices	4	CFT40W	CFT40/2-BX	72	0.29	SW	2400	C-OCC	691	114
254	125B Gym Office	Offices	2	T 32 R F 4 (ELE)	F44LL	118	0.24	SW	2400	C-OCC	566	115
55	125B Gym Office	Offices	1	2T 17 R F 3 (ELE)	F23ILL	47	0.05	SW	2400	C-OCC	113	116
198	Women's TR	Bath Room	1	2T 17 R F 2 (ELE) REFLECTOR	F22LL	31	0.03	SW	2000	C-OCC	62	117
254	125A Office	Offices	2	T 32 R F 4 (ELE)	F44LL	118	0.24	SW	2400	C-OCC	566	118
55	125A Office	Offices	1	2T 17 R F 3 (ELE)	F23ILL	47	0.05	SW	2400	C-OCC	113	119
198	125A Office	Offices	1	2T 17 R F 2 (ELE) REFLECTOR	F22LL	31	0.03	SW	2400	C-OCC	74	120
257	Weight Room	Weight Room	4	CFT40W	CFT40/2-BX	72	0.29	SW	1000	C-OCC	288	121
257	Boy's Locker Room	Locker	11	CFT40W	CFT40/2-BX	72	0.79	SW	2800	C-OCC	2,218	122
257	Boy's Locker Room TR	Locker	4	CFT40W	CFT40/2-BX	72	0.29	SW	2800	C-OCC	806	123
257	Girl's Locker Room	Locker	8	CFT40W	CFT40/2-BX	72	0.58	SW	2800	C-OCC	1,613	124
257	Girl's Locker Room TR	Bath Room	4	CFT40W	CFT40/2-BX	72	0.29	SW	2000	C-OCC	576	125
257	Corridor	Hallways	8	CFT40W	CFT40/2-BX	72	0.58	SW	2280	C-OCC	1,313	126
257	Faculty Room	Offices	11	CFT40W	CFT40/2-BX	72	0.79	SW	2400	C-OCC	1,901	127
7	Men's TR	Bath Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2000	C-OCC	120	128
7	Women's TR	Bath Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	2000	C-OCC	120	129
201	119 SGI	Classrooms	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	C-OCC	2400	C-OCC	1,296	130
7	119 SGI	Classrooms	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	C-OCC	2400	C-OCC	144	131
259	Multipurpose Room	Break/Lunch Rooms	12	CFT40W	CFT40/8-BX	288	3.46	SW	3102.5	C-OCC	10,722	132
199	Multipurpose Room	Break/Lunch Rooms	34	W 32 C F 1 (ELE)	F41LL	32	1.09	SW	3102.5	C-OCC	3,376	133
258	Corridor	Hallways	11	CFQ13W	CFQ13/2-L	28	0.31	SW	2280	C-OCC	702	134
55	Corridor	Hallways	_	2T 17 R F 3 (ELE)	F23ILL	47	0.52	SW	2280	C-OCC	1,179	135
201	114 Music	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	SW	2400	C-OCC	2,592	136
13	113 Music	Classrooms	42	S 32 P F 2 (ELE)	F42LL	60	2.52	SW	2400	C-OCC	6,048	137
7	113 Office	Classrooms	4	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.24	SW	2400	C-OCC	576	138
254	113 Storage	Storage Areas	3	T 32 R F 4 (ELE)	F44LL	118	0.35	SW	1000	C-OCC	354	139
201	127 Classroom	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	2400	C-OCC	2,592	140
201	126 Classroom	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	2400	C-OCC	2,592	141
55	Corridor	Hallways	10	2T 17 R F 3 (ELE)	F23ILL	47	0.47	SW	2280	C-OCC	1,072	142
258	Corridor 157 Classroom	Hallways	/	CFQ13W	CFQ13/2-L	28	0.20	SW	2280	C-OCC	447	143
13	157 Classroom	Classrooms	18	S 32 P F 2 (ELE)	F42LL	60	1.08	C-OCC	2400	C-OCC	2,592	144
201	153 SGI	Classrooms	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	C-OCC	2400	C-OCC	1,944	145
201	154 SGI	Classrooms	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	C-OCC	2400	C-OCC	1,944	146
13	Boy's TR	Bath Room	12	S 32 P F 2 (ELE)	F42LL	60	0.72	SW	2000	C-OCC	1,440	147
13	Girl's TR	Bath Room		S 32 P F 2 (ELE)	F42LL	60	0.72	SW	2000	C-OCC	1,440	148
13	158 Classroom	Classrooms		S 32 P F 2 (ELE)	F42LL	60	1.08	C-OCC	2400	C-OCC	2,592	149
	Total		1,176				91.14				214,449	

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APPENDIX C
ECM Calculations
New Jersey BPU - Energy Audits

	Summary of Energy Conservation Measures												
	<b>Energy Conservation Measure</b>	Approx. Costs (\$)	Approx. Savings (\$/year)	Payback (Years) w/o Incentive	Potential Incentive (\$)*	Payback (Years) w/ Incentive	Recommen ded For Implement ation						
ECM-1	Air Handler Replacement (AHU-1 & AHU-2)	116,000	900	>20	4,300	>20							
ECM-2	Boiler Replacement	265,000	300	>20	9,000	>20							
ECM-3	Replace DWH	7,000	300	>20	500	>20							
ECM-4	Install VSD & Premium Motors on HW Pumps	10,000	1,900	5	2,300	4	X						
ECM-5	Demand Controlled Ventilation (Gym & Cafeteria)	20,000	1,500	13	0	13	X						
ECM-6	Walk-in Cooler Controls	15,000	900	17	0	17							
ECM-7	Seal Windows Properly	14,000	700	20	0	20							
ECM-8	Lighting Replacement / Upgrades	50,000	2,800	18	5,500	16							
ECM-9	Install Lighting Controls (Occupancy Sensors)	22,000	5,700	4	3,900	3	X						
ECM-10	Lighting Replacements with Lighting Controls (Occupancy Sensors)	72,000	7,900	9	9,400	8							
ECM-11	Install Low Flow Plumbing Fixtures	6,000	700	9	0	9	X						

#### **ECM Summary Sheet**

ECM-1	Air Handler Replacement (AHU-1 & AHU-2)
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Budgetary	Annual Utility	Savings	•		Estimated	Total			Payback	Payback
Cost	7 tillidai Otility	Cavingo			Maintenance	Savings	ROI	Incentive *	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
116,000	6,500	0	0	900	0	900	(8.0)	4,300	>20	>20

#### ECM-2 Boiler Replacement

Budgetary Cost	Annual Utility	Savings			Estimated Maintenance	Total Savings	ROI	Incentive *	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
265,000	0	0	300	300	0	300	(1.0)	9,000	>20	>20

## ECM-3 Replace DWH

Budgetary	Annual Utility	Savings			Estimated	Total	201		Payback	Payback
Cost					Maintenance	Savings	ROI	Incentive *	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
7,000	0	0	300	300	0	300	(0.5)	500	>20	>20

## ECM-4 Install VSD & Premium Motors on HW Pumps

Budgetary	Annual Utility	Savings			Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	Incentive *	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
10,000	14,200	0	0	1,900	0	1,900	2.8	2,300	5.3	4.1

## ECM-5 Demand Controlled Ventilation (Gym & Cafeteria)

Budgetary	Annual Utility	Savings			Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	Incentive *	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
20,000	5,700	0	700	1,500	0	1,500	0.1	0	13.3	13.3

## ECM-6 Walk-in Cooler Controls

Budgetary	Annual Utility	Savings			Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	Incentive *	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
15,000	6,300	0	0	900	0	900	(0.1)	0	16.7	16.7

## ECM-7 Seal Windows Properly

	Ocai Wille	iows i rope	, i i y							
Budgetary	Annual Utility	Savings			Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	Incentive *	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
14.000	900	0	600	700	0	700	(0.4)	0	20.0	20.0

# ECM-8 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility	Savings			Estimated Maintenance	Total Savings	ROI	Incentive *	Payback (without	Payback (with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
50,000	19,000	8.3	0	2,800	0	2,800	(0.2)	5,500	17.9	15.9

## ECM-9 Install Lighting Controls (Occupancy Sensors)

Budgetary	Annual Utility	Savings			Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	Incentive *	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
22,000	43,900	0	0	5,700	0	5,700	3.0	3,900	3.9	3.2

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

Budgetary	Annual Utility	Savings			Estimated	Total			Payback	Payback
Cost					Maintenance	Savings	ROI	Incentive *	(without	(with
	Electric	Electric	Nat Gas	Total	Savings				incentive)	incentive)
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
72,000	58,500	8.3	0	7,900	0	7,900	0.6	9,400	9.1	7.9

## ECM-11 Install Low Flow Plumbing Fixtures

Budgetary Cost	Annual Utility	nnual Utility Savings			Estimated Maintenance	Total Savings	ROI	Incentive *	Payback (without	Payback (with	
	Electric	Electric	Water	Total	Savings				incentive)	incentive)	
\$	kWh	kW	kgal/yr	\$	\$	\$		\$	Years	Years	
6,000	0	0	100	700	0	700	0.9	0	8.6	8.6	

Utility	/ Costs	Yearly Usage	MTCDE	Building Area	Annual U	tility Cost
\$ 0.135	\$/kWh blended		0.00042021	85,106	Electric	Natural Gas
\$ 0.130	\$/kWh supply	1,166,200	0.00042021		\$157,855.54	\$15,958.23
\$ 3.44	\$/kW	164	0			
\$ 1.02	\$/Therm	15,572	0.00533471			
\$ 10.04	\$/kgals	569	0			

# Franklin Avenue Middle School

	Item			Sa	vings			Cost	Simple		Life	NJ Smart Start	Direct Install	Direct Install	Max	Payback w/		Simp	le Projected	Lifetime Sav	ings		ROI
		kW	kWh	therms	cooling kWh	kgal/yr	\$		Payback	MTCDE	Expectancy	Incentives	Eligible (Y/N)*	Incentives**	Incentives	Incentives***	kW	kWh	therms	cooling	kgal/yr	\$	
ECM-1	Air Handler Replacement (AHU-1 & AHU-2)	0.0	0	0	6,482	0	\$ 900	\$ 115,600	128.4	2.7	25	\$ 4,320	Y	\$ 75,000	\$ 4,320	123.6	0.0	0	0	162,050	0	\$ 21,899	(8.0)
ECM-2	Boiler Replacement	0.0	0	284	0	0	\$ 300	\$ 265,127	883.8	1.5	25	\$ 9,000	Y	\$ 75,000	\$ 9,000	853.8	0.0	0	7,094	0	0	\$ 7,270	(1.0)
ECM-3	Replace DWH	0.0	0	303	0	0	\$ 300	\$ 7,482	24.9	1.6	12	\$ 500	Y	\$ 5,200	\$ 500	23.3	0.0	0	3,632	0	0	\$ 3,722	(0.5)
ECM-4	Install VSD & Premium Motors on HW Pumps	0.0	14,243	0	0	0	\$ 1,900	\$ 10,197	5.4	6.0	20	\$ 2,300	Y	\$ 7,100	\$ 2,300	4.2	0.0	284,855	0	0	0	\$ 38,495	2.8
ECM-5	Demand Controlled Ventilation (Gym & Cafeteria)	0.0	0	686	5,741	0	\$ 1,500	\$ 20,000	13.3	6.1	15			\$ -	\$ -	13.3	0.0	0	10,288	86,122	0	\$ 22,181	0.1
ECM-6	Walk-in Cooler Controls	0.0	6,297	0	0	0	\$ 900	\$ 15,000	16.7	2.6	15			\$ -	\$ -	16.7	0.0	94,462	0	0	0	\$ 12,766	(0.1)
ECM-7	Seal Windows Properly	0.0	0	579	880	0	\$ 700	\$ 14,000	20.0	3.5	12			\$ -	\$ -	20.0	0.0	0	6,951	10,562	0	\$ 8,550	(0.4)
ECM-8	Lighting Replacement / Upgrades	8.3	18,966	0	0	0	\$ 2,800	\$ 49,929	17.8	8.0	15	\$ 5,540	Y	\$ 35,000	\$ 5,540	15.9	123.9	284,497	0	0	0	\$ 41,988	(0.2)
ECM-9	Install Lighting Controls (Occupancy Sensors)	0.0	43,941	0	0	0	\$ 5,700	\$ 22,275	3.9	18.5	15	\$ 3,850	Y	\$ 15,600	\$ 3,850	3.2	0.0	659,109	0	0	0	\$ 89,072	3.0
ECM-10	Lighting Replacements with Lighting Controls (Occupancy Sensors)	8.3	58,518	0	0	0	\$ 7,900	\$ 72,204	9.1	24.6	15	\$ 9,390	Y	\$ 50,500	\$ 9,390	8.0	123.9	877,763	0	0	0	\$ 118,889	0.6
ECM-11	Install Low Flow Plumbing Fixtures	0.0	0	0	0	69	\$ 700	\$ 5,516	7.9	0.0	15			\$ -	\$ -	7.9	0.0	0	0	0	1,030	\$ 10,337	0.9
	Total (Does Not Include ECM-9 & ECM-10)	8.3	79,058	1,852	13,104	69	\$ 15,100	\$ 525,126	34.8		17	\$ 25,510		\$ 212,800	\$ 25,510	33.1	123.9	1,257,080	27,965	258,734	1,030	\$244,109	(0.5)
	Total Measures with Payback <15	8.3	72,760	0	0	69	\$ 10,500	\$ 87,917	8.4		16	\$ 11,690		\$ 57,600	\$ 11,690	7.3	123.9	1,162,618	0	0	1,030	\$167,721	0.9
	% of Existing	5%	7%	12%	1%	12%																	

EQUIPMENT	AREA SERVED	COOLING CAPACITY (MBH)	_
AHU-1	Cafeteria	318.0	
AHU-2	Stage	318.0	
	Total Electric DX Cooling:	636	MBH

## ECM-1: Air Handler Replacement (AHU-1 & AHU-2)

ASSUMPTIO	NS		Comments				
Electric Cost	\$0.135	/ kWh					
Average run hours per Week	60	Hours	Unit is manually turned on (even if after hours)				
Space Balance Point	55	F					
Space Temperature Setpoint	74	deg F	setpoint				
Avg. BTU / Hr Rating of existing RTU	636,000	Btu / Hr	(typical size for cooling spaces in this type of building)				
Average EER	10.0						

<u>Item</u>	<u>Value</u>	<u>Units</u>	<u>Comments</u>
Total Number of Units	2		
Existing Annual Electric Usage	24,488	kWh	
Proposed EER	13.6		New VAV RTU (per manufacturer)
Proposed Annual Electric Usage	18,006	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVI	NGS	
Annual Savings	6,482	kWh
Annual Cost Savings	\$876	

OAT - DB		Cooling Hrs		Assumed
Bin	Annual	at Temp Above	Assumed % of	hrs of
Temp F	Hours	balance point	time of operation	Operation
102.5	0	0	100%	0
97.5	6	2	89%	2
92.5	45	16	79%	13
87.5	146	52	68%	36
82.5	298	106	58%	62
77.5	476	170	47%	81
72.5	662	0	0%	0
67.5	740	0	0%	0
62.5	765	0	0%	0
57.5	733	0	0%	0
52.5	668	0	0%	0
47.5	659	0	0%	0
42.5	685	0	0%	0
37.5	739	0	0%	0
32.5	717	0	0%	0
27.5	543	0	0%	0
22.5	318	0	0%	0
17.5	245	0	0%	0
12.5	156	0	0%	0
7.5	92	0	0%	0
2.5	36	0	0%	0
-2.5	19	0	0%	0
-7.5	8	0	0%	0
То	tal 8,760	347	55%	193

Franklin Lakes Public Schools - NJBPU CHA Project #24497 Franklin Avenue Middle School

ECM-1: Air Handler Replacement (AHU-1 & AHU-2) - Cost

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	l	JNIT COST	S	SU	IBTOTAL C	OSTS	TOTAL	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	COST	KEWAKKS
						\$ -	\$ -	\$ -	\$ -	
Existing (2) RTUs demolition	2	EA	\$ 100	\$ 1,500		\$ 220	\$ 4,050	\$ -	\$ 4,270	
(1) RTU, 30.0 tons with DX cooling	2	EA	\$ 30,000	\$ 3,500		\$ 66,000	\$ 9,450	\$ -	\$ 75,450	
Electrical - misc.	1	LS	\$ 1,000	\$ 5,000		\$ 1,100	\$ 6,750	\$ -	\$ 7,850	
						\$ -	\$ -	\$ -	\$ -	

Φ	97 570	Subtotal
φ	67,370	Subtotal
\$	8,757	10% Contingency
\$	19,265	20% Contractor O&P
\$	-	0% Engineering
\$	115.600	Total

### **ECM-2: Boiler Replacement**

Existing Fuel Nat.Gas ▼
Proposed Fuel Nat.Gas ▼

<u>ltem</u>	<u>Value</u>	<u>Units</u>	Formula/Comments
Baseline Fuel Cost	\$ 1.02	/ Therm	
Proposed Fuel Cost	\$ 1.02	/ Therm	
Baseline Fuel Use	12,769	Therms	Based on historical utility data
Existing Boiler Plant Efficiency	88%		Estimated or Measured
Baseline Boiler Load	1,123,700	Mbtu/yr	Baseline Fuel Use x Existing Efficiency x 100 Mbtu/Therms
Baseline Fuel Cost	\$ 13,086		
Proposed Boiler Plant Efficiency	90%		New Boiler Efficiency
Proposed Fuel Use	12,486	Therms	Baseline Boiler Load / Proposed Efficiency / 100 Mbtu/Therms
Proposed Fuel Cost	\$ 12,795		

<sup>\*</sup>Note to engineer: Link savings back to summary sheet in appropriate column.

BOILER REPLACEMENT SAVINGS SUMMARY									
Electric Electric Nat Gas									
	Demand	Usage	Usage	Maint.	Total Cost				
	( kW )	(kWh)	(Therms)	(\$)	( \$)				
Savings	0	0	284	\$0	\$291				

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

### **ECM-2:** Boiler Replacement - Cost

Description	OTV	QTY UNIT		UNIT COSTS		SUBTOTAL COSTS			TOTAL COST	DEMARKS
Description	QII	UNIT	MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	TOTAL COST	REWARKS
3,000 MBH NG Condensing Boiler	3	EA	\$ 45,000	\$ 2,000		\$148,500	\$ 8,100	\$ -	\$ 156,600	
Flue Installation	25	LF	\$ 75.0	\$ 15.00		\$ 2,063	\$ 506	\$ -	\$ 2,569	
Reprogram DDC system	3	EA	\$ 100.0	\$ 350.00		\$ 330	\$ 1,418	\$ -	\$ 1,748	
Miscellaneous Electrical	1	LS	\$ 500	\$ 250		\$ 550	\$ 338	\$ -	\$ 888	
Miscellaneous HW Piping	1	LS	\$ 2,000	\$ 1,000		\$ 2,200	\$ 1,350	\$ -	\$ 3,550	
Boiler room/space construction	1	LS	\$ 20,000	\$ 10,000		\$ 22,000	\$ 13,500	\$ -	\$ 35,500	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	

\$ 200,854	Subtotal
\$ 20,085.38	10% Contingency
\$ 44,187.83	20% Contractor O&P
\$ -	
\$ 265,127	Total

## ECM-3: Replace DWH

#### **Summary**

<u>Item</u>	<u>Value</u>	<u>Units</u>	Formula/Comments
Avg. Monthly Utility Demand by Water Heater	104	Therms/month	Calculated from utility bill
Total Annual Utility Demand by Water Heater	124,579	MBTU/yr	1therm = 100 MBTU
Existing DHW Heater Efficiency	80%		Per manufacturer nameplate
Total Annual Hot Water Demand (w/ standby losses)	99,663	MBTU/yr	
Existing Tank Size	100	Gallons	Per manufacturer nameplate
Hot Water Piping System Capacity	200	Gallons	Estimated Per existing system (includes HWR piping)
Hot Water Temperature	120	°F	Per building personnel
Room Temperature	70	°F	
Standby Losses (% by Volume)	2.5%		( 2.5% of stored capacity per hour, per U.S. Department of Energy )
Standby Losses (Heat Loss)	3.1	MBH	
Annual Standby Hot Water Load	27,375	MBTU/yr	
New Tank Size	0	Gallons	Based on Takagi Flash T-H1 instantaneous, condensing DHW Heater
Hot Water Piping System Capacity	200	Gallons	Estimated Per existing system (includes HWR piping)
Hot Water Temperature	120	°F	
Room Temperature	70	°F	
Standby Losses (% by Volume)	2.5%		( 2.5% of stored capacity per hour, per U.S. Department of Energy )
Standby Losses (Heat Loss)	2.1	MBH	
Annual Standby Hot Water Load	18,250	MBTU/yr	
Total Annual Hot Water Demand	90,538	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		Based on Takagi Flash T-H1 instantaneous, condensing DHW Heater
Proposed Fuel Use	943	Therms	Standby Losses and inefficient DHW heater eliminated
Utility Cost	\$1.02	\$/Therm	
Existing Operating Cost of DHW	\$1,277	\$/yr	
Proposed Operating Cost of DHW	\$966	\$/yr	

### **Savings Summary:**

Utility	Energy Savings	Cost Savings
Therms/yr	303	\$310

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

## ECM-3: Replace DWH - Cost

Description	QTY	UNIT		UNIT (	COSTS	6		SUE	зтот	TAL CO	STS	] -	TOTAL	REMARKS
Description	QII	ONIT	MAT.	LAE	3OR	EQUIP.	N	ΛΑΤ.	LA	ABOR	EQUIP.		COST	REMARKS
Gas-Fired DHW Heater Removal	1	LS		\$	50		\$	-	\$	68	\$ -	\$	68	
High Efficiency Tankless Gas-Fired DHW Heater	1	LS	\$ 3,000	\$	280		\$	3,300	\$	378	\$ -	\$	3,678	
Miscellaneous Electrical	1	LS	\$ 300				\$	330	\$	-	\$ -	\$	330	
Venting Kit	1	EA	\$ 450	\$	650		\$	495	\$	878	\$	\$	1,373	
Miscellaneous Piping and Valves	1	LS	\$ 200				\$	220	\$	-	\$ -	\$	220	
							\$	-	\$	-	\$ -	\$	-	
							\$	-	\$	-	\$ -	\$	-	
							\$	-	\$	-	\$ -	\$	-	
							\$	-	\$	-	\$ -	\$	-	

\$ 5,668	Subtotal
\$ 567	10% Contingency
\$ 1,247	20% Contractor O&P
\$ -	
\$ 7,482	Total

## ECM-4: Install VSD & Premium Motors on HW Pumps

### **Variable Inputs**

Blended Electric Rate \$0.14
Heating System "On" Point 55
VFD Efficiency 98.5%

## **ECM Description Summary**

	PUMP SCHEDULE												
Pump ID Qty HP Total HP Motor Eff. Eff. Note 1 Note 2													
P-5, P-6	1	7.5	7.5	85.5%	92.0%	5.24	4.87						
					Total:	5.24	4.87						

	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))	(F) =D*AA	(G) =BB*E^2.5/CC	(H)	(I) =D*G	(J) =F-H					
See Note 3	See Note 3	See Note 3		See Note 4		See Note 5								
97.5	75	6	0	0%	0	0.0	0.0%	0	0					
92.5	74	45	0	0%	0	0.0	0.0%	0	0					
87.5	72	146	0	0%	0	0.0	0.0%	0	0					
82.5	69	298	0	0%	0	0.0	0.0%	0	0					
77.5	67	476	0	0%	0	0.0	0.0%	0	0					
72.5	64	662	0	0%	0	0.0	0.0%	0	0					
67.5	62	740	0	0%	0	0.0	0.0%	0	0					
62.5	58	765	0	0%	0	0.0	0.0%	0	0					
57.5	53	733	0	0%	0	0.0	0.0%	0	0					
52.5	47	668	668	53%	3,499	1.0	84.1%	794	2,705					
47.5	43	659	659	58%	3,451	1.3	88.8%	953	2,499					
42.5	38	685	685	64%	3,588	1.6	92.7%	1,191	2,397					
37.5	34	739	739	69%	3,870	2.0	95.9%	1,531	2,340					
32.5	30	717	717	75%	3,755	2.4	98.2%	1,758	1,998					
27.5	25	543	543	81%	2,844	2.9	99.8%	1,567	1,277					
22.5	20	318	318	86%	1,666	3.4	100.0%	1,081	584					
17.5	16	245	245	92%	1,283	4.0	100.0%	974	309					
12.5	11	156	156	97%	817	4.6	99.7%	721	97					
7.5	6	92	92	100%	482	4.9	99.0%	459	23					
2.5	2	36	36	100%	189	4.9	99.0%	180	9					
-2.5	-3	19	19	100%	100	4.9	99.0%	95	5					
-7.5	-8	8	8	100%	42	4.9	99.0%	40	2					
		8,760	4,887		25,585			11,342	14,243					

## Notes:

- Existing motor power was determined using...
- 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 ...
- 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.

	HW PUMP VFD - SAVINGS SUMMARY												
	Electric	Electric	Nat Gas		Total								
	Demand	Usage	Usage	Maint.	Cost								
	( kW )	(kWh)	(Therms)	(\$)	( \$)								
Savings	0	14,243	0	\$0	\$1,925								

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.00

### ECM-4: Install VSD & Premium Motors on HW Pumps - Cost

Description		UNIT		UNIT COST	S	SUI	BTOTAL CC	STS	TOTAL	REMARKS
Description	QTY	ONIT	MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.	COST	REWARRS
						\$ -	\$ -	\$ -	\$ -	
7.5 HP VFD	2	ea	\$ 2,021	\$ 509		\$ 4,447	\$ 1,375	\$ -	\$ 5,822	
7.5 HP Motor	2	ea	\$ 536	\$ 84		\$ 1,178	\$ 227	\$ -	\$ 1,405	
Electrical - misc.	2	Is	\$ 200	\$ 150		\$ 440	\$ 405	\$ -	\$ 845	
Duct pressure sensor/transmitter	2	ea	\$ 500	\$ 200		\$ 1,100	\$ 540	\$ -	\$ 1,640	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	

\$ 9,712	Subtotal
\$ 486	5% contingency
\$ -	
\$ -	
\$ 10,197	Total

#### Franklin Lakes Public Schools - NJBPU CHA Project #24497 Franklin Avenue Middle School

		FAN			
		MOTOR			
AIR HANDLER	AREA SERVED	HP	CFM	CFM	
AHU-1	Cafeteria / Stage	5.0	8,000	1,200	
AHU-2	Cafeteria / Stage	5.0	8,000	1,200	
HV-1	Gym	15.0	12,000	1,800	
HV-2	Gym	15.0	12,000	1,800	

40.0 HP 6,000 CFM

#### **ECM 5: Demand Controlled Ventilation (GYM & Cafeteria)**

#### **ECM Description Summary**

It is assumed the original system controls provide the full design ventilation outside air flow. Reducing outside air during occupied time periods will reduce heating and cooling energy used during the occupied period. A limit of 1000 PPM of CO2 is recommended in ASHRAE Standard 62-1982, Ventilation for Acceptable Indoor Air Quality. During unoccupied periods the outside air dampers should be closed.

Electric Cost			0.14	/kWh
Natural Gas Cost		\$	1.30	/therm
Facility Ventilation Hea	ating Load		226,800	BTU/Hour <sup>1,2,3,4</sup>
Facility Ventilation Cod	oling Load		64,800	BTU/Hour <sup>1,2,3,4</sup>
Existing Ventilation He	ating Usage		3,429	therms <sup>6</sup>
Existing Ventilation Co	oling Usage		28,707	kWh <sup>6</sup>
Proposed Ventilation Heating Usage			2,743	therms <sup>7</sup>
Proposed Ventilation (	Cooling Usage		22,966	kWh <sup>7</sup>
Proposed Ventilation F	an Savings		0	kWh <sup>5,8</sup>
Total heating savings			686	therms
Total cooling savings			5,741	kWh
Total cost savings			1,669	
<b>Estimated Total Proje</b>	ct Cost		\$20,000	9
Simple Payback			12	years

#### **Assumptions**

5

7

- 1 6,000 OA AHU airflow based exsiting design drawing schedules
- 2 35 °F, Assumed average heating Δt (mixed air and supply)
- 3 10 °F, Assumed average cooling Δt (mixed air and supply)
- 4 100% Typical energy recovery unit efficiency assumed based on prior project experience
  - 0.0 kW of existing supply fan motor calculated based on electrical data from nameplate
- 6 1,512 AHU run time per heating/cooling seasons [12 hours/day, 21 days/month, 6 months/year]
  - 20% Estimated savings for DCV based on reducing unit run time from 12 hours to 10 hours per day
- 8 504 Assumed supply fan run time reduction based on 2 hours/day fan is "off" due to DCV
- 9 \$ 20,000 estimated measure cost for installation of sensors and associated controls

#### **ECM-6: Walk-in Cooler & Freezer Controls**

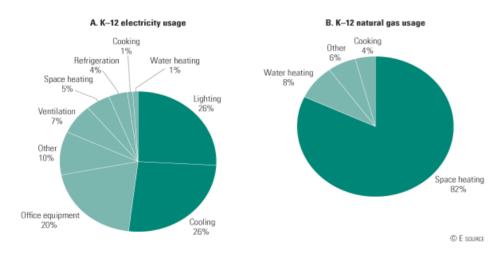
#### **ECM Description Summary**

For kitchens that contain walk-in coolers and freezers, CoolTrol is a controller that reduces energy consumption by controlling off of dewpoint temperature. Compressor cycling is reduced and the evaporator fans run 25% to 80% less. Door and frame heaters are also installed and controlled by store dew point temperature; this can reduce run time by up to 95% in coolers and 60% in freezers. The evaporator fan motors are also replaced with hi-efficient fan motors saving 40% to 70% in energy. The proposed system comprises of an anti-sweat door controller, evaporator fan motor replacement and CoolTrol Cooler Control System.

EXISTING CONDITIONS	
Existing Facility Total Electric usage	1,166,200 kWh
Existing Facility Refridgeration Electric usage	69,972 kWh <sup>1</sup>
Existing Facility Walk-In Electric usage	20,992 kWh <sup>2</sup>
Walk-In Controls System Annual Electric savings	6,297 kWh <sup>3</sup>
SAVINGS	
Walk-In Controls Electric Usage Savings	6,297 kWh
Total cost savings	\$ 851.04
Estimated Total Project Cost	\$ 15,000 4
Simple Payback	17.6 years

#### Assumptions

- 1 6% of facility total electricity; Source: E source, data from U.S. Energy Information Administration
- 2 30% of refrigeration attributable to walk-in based on site observations
- 3 30% Electric load reduction typical for walk-in controllers
- 4 Based on (2) "Cooltrol" walk-in controls systems



Franklin Lakes Public Schools - NJBPU
CHA Project #24497
Franklin Avenue Middle School

## **ECM-7 Seal Windows Properly**

Existing: Windows are not properly sealed. This can lead to increased energy consumption due to infiltration/exfiltration and heat gain/loss. Proposed: Install weather strip or caulking to properly seal windows

Linear Feet of window Edge
Area of window glass

Existing Infiltration Factor
Proposed Infiltration Factor
Existing U Value
Proposed U Value

3,343.6 LF
2,630.5 SF
0.20 cfm/LF
0.10 cfm/LF
0.45 Btuh/SF/°F
Btuh/SF/°F

Cooling System Efficiency
Ex Occupied Clng Temp.
Ex Unoccupied Clng Temp.
Cooling Occ Enthalpy Setpoint
Cooling Unocc Enthalpy Setpoint

Heating System Efficiency
Heating On Temp.
Ex Occupied Htg Temp.
Ex Unoccupied Htg Temp.
Electricity
Natural Gas

60 \*F 68 \*F 58 \*F \$ 0.135 \$/kWh \$ 1.02 \$/therm

80%

					EXISTING	G LOADS	PROPOSE	ED LOADS	COOLIN	IG ENERGY	HEATING E	NERGY
					Occupied	Unoccupied	Occupied	Unoccupied				
					Window	Window	Window	Window	Existing			Proposed
Avg Outdoor		Existing	Occupied	Unoccupied	Infiltration &	Infiltration &	Infiltration &	Infiltration &	Cooling	Proposed	<b>Existing Heating</b>	Heating
Air Temp. Bins	Avg Outdoor	Equipment Bin	Equipment Bin	•	Heat Load	Heat Load	Heat Load	Heat Load	Energy	Cooling Energy		Energy
° <b>F</b>	Air Enthalpy	Hours	Hours	Hours	втин	втин	втин	втин	kWh	kWh	Therms	Therms
Α		В	С	D	E	F	G	Н	I	J	K	L
102.5	50.1	0	0	0	-101,745	-99,378	-67,741	-65,373	0	0	0	0
97.5	42.5	6	2	4	-72,956	-70,589	-50,387	-48,020	43	29	0	0
92.5	39.5	45	16	29	-58,010	-55,643	-39,955	-37,587	254	173	0	0
87.5	36.6	146	52	94	-43,365	-40,997	-29,673	-27,305	611	411	0	0
82.5	34.0	298	106	192	-29,622	-27,254	-19,842	-17,474	838	546	0	0
77.5	31.6	476	170	306	-16,481	-14,113	-10,312	-7,945	712	419	0	0
72.5	29.2	662	237	426	0	0	0	0	0	0	0	0
67.5	27.0	740	264	476	0	0	0	0	0	0	0	0
62.5	24.5	765	273	492	0	0	0	0	0	0	0	0
57.5	21.4	733	262	471	20,013	953	16,221	772	0	0	71	58
52.5	18.7	668	239	430	29,542	10,483	23,945	8,497	0	0	144	117
47.5	16.2	659	235	424	39,072	20,013	31,669	16,221	0	0	221	179
42.5	14.4	685	245	441	48,602	29,542	39,394	23,945	0	0	311	252
37.5	12.6	739	264	475	58,132	39,072	47,118	31,669	0	0	424	344
32.5	10.7	717	256	461	67,661	48,602	54,842	39,394	0	0	497	403
27.5	8.6	543	194	349	77,191	58,132	62,566	47,118	0	0	441	357
22.5	6.8	318	114	205	86,721	67,661	70,291	54,842	0	0	296	240
17.5	5.5	245	88	158	96,251	77,191	78,015	62,566	0	0	257	209
12.5	4.1	156	56	100	105,781	86,721	85,739	70,291	0	0	182	148
7.5	2.6	92	33	59	115,310	96,251	93,463	78,015	0	0	119	96
2.5	1.0	36	13	23	124,840	105,781	101,187	85,739	0	0	51	41
-2.5	0.0	19	7	12	134,370	115,310	108,912	93,463	0	0	29	24
-7.5	-1.5	8	3	5	143,900	124,840	116,636	101,187	0	0	13	11
TOTALS		8,760	3,129	5,631					2459	1578	3,057	2,478

1.2 kW/ton

74 \*F 76 \*F

27.5 Btu/lb 27.5 Btu/lb

Existing Window Infiltration Existing Window Heat Transfer Proposed Window Infiltration Proposed Window Heat Transfer 669 cfm 1,184 Btuh/°F 334 cfm 1,184 Btuh/°F

Savings	579	Therms	\$ 594
	880	kWh	\$ 119
			\$ 713

Window ID	Location	Quantity	Width	Height	Linear Feet (LF)	Area (SF)	Infiltration Rate	U Value	Infiltration	Heat Transfer
Willdow ID	Location	Quantity	(ft)	(ft)	Linear Feet (LF)	Alea (SF)	(CFM/LF)	(Btuh/SF/°F)	(CFM)	(Btuh/°F)
1	Exterior Wall	210	2.3	5.3	3192.0	2559.9	0.2	0.45	638.4	1152.0
2	Exterior Wall	3	2.3	2.7	30.0	18.6	0.2	0.45	6.0	8.4
3	Exterior Wall	16	1.3	2.5	121.6	52.0	0.2	0.45	24.3	23.4
Total		229	5.9	10.5	3,343.6	2,630.5	0.20	0.45	668.7	1183.7

### **ECM-11 Install Low Flow Plumbing Fixtures**

EXISTING	CONDITIONS	
Cost of Water / 1000 Gallons	\$10.04	\$ / kGal
Toilets in Building		3
Average Flushes / Toilet (per Day)	Q	)
Average Gallons / Flush	3.5	Gal

PROPOSED COND	ITIONS	
Proposed Toilets to be Replaced	8	
Proposed Gallons / Flush	1.6	Gal
Proposed Material Cost of new Flush Valves	\$315	
Proposed Installation cost of new Flush Valves	\$139	
Total cost of new toilets & valves	\$3,630	

SAVINGS		
Current Toilet Water Use	92	kGal / year
Proposed Toilet Water Use	42	kGal / year
Water Savings	50	kGal / year
Cost Savings	\$501	/ year
Simple Payback	7.2	years

## **ECM-11: Install Low Flow Plumbing Fixtures**

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	\$10.04	\$ / kGal
Urinals in Building	3	
Average Flushes / Urinal (per Day)	9	
Average Gallons / Flush	3.5	Gal

PROPOSED CONDITIONS		
Proposed Urinals to be Replaced	3	
Proposed Gallons / Flush	1.6	Gal
Proposed Material Cost	\$360	
Proposed Installation Cost	\$269	
Total cost of new urinals & valves	\$1,886	

SAVINGS		
Current Urinal Water Use	34	kGal / year
Proposed Urinal Water Use	16	kGal / year
Water Savings	19	kGal / year
Cost Savings	\$188	/ year
Simple Payback	10.0	years

# Energy Audit of Franklin Avenue Middle School CHA Project No.24497

# **ECM-1 Lighting Replacements**

Budgetary		Annual Uti	lity Savings		Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$49,929	8.3	18,966	0	\$2,977	0	\$2,977	\$5,540	16.8	14.9

<sup>\*</sup>Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

# **ECM-2 Install Occupancy Sensors**

Budgetary		Annual Uti	lity Savings		Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$22,275	0.0	43,941	0	\$4,702	0	\$4,702	\$3,850	4.7	3.9

<sup>\*</sup>Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

# **ECM-3 Lighting Replacements with Occupancy Sensors**

Budgetary		Annual Uti	lity Savings		Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings			-	
\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$72,204	8.3	58,518	0	\$6,930	0	\$6,930	\$9,390	10.4	9.1

<sup>\*</sup>Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

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**ECM-1 Lighting Replacements** 

Cost of Electricity: \$0.125 \$/kWh

\$6.07 \$/kW

				EXISTING COND	OITIONS							RETROFIT C	ONDITION	S					COS	ST & SAVIN	GS ANALY	'SIS		
																						NJ Smart	Simple	
		No. of			Watts pe	r	Exist	Annual		Number of			Watts per		Retrofit	Annual	Annual	Annual kWh	Annual kW	Annual \$	Retrofit	Start Lighting	Payback With Out	Simple
	Area Description	Fixtures	Standard Fixture Code	NYSERDA Fixture Code	•	kW/Space	Control	Hours	Annual kWh	Fixtures	Standard Fixture Code	Fixture Code	Fixture	kW/Space	Control	Hours	kWh	Saved	Saved	Saved	Cost	Incentive	Incentive	Payback
	Unique description of the location - Room number/Room name: Floor		"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w	Code from Table of Standard		` '		Estimated daily	` '	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40	Code from Table of Standard Fixture	Value from Table of	(	Retrofit		(kW/space)	. •		(kWh Saved) * (\$/kWh)		Prescriptive	Length of time	Length of time for
Code	number (if applicable)		Recess. Floor 2 lamps U shape	Fixture Wattages	Table of Standard	` /		nours for the usage group	(Annual Hours)	after the retrofit	` '	Wattages	Standard	`	control device	annual hours for the usage	\	(Retrofit Annual	,	(\$/KVVN)	lighting		renovations	renovations cost to be recovered
					Fixture Wattages								Fixture Wattages			group		kWh)	kW)		system		cost to be recovered	1
40	Boiler Room	4	C 22 D E 2 /EL E\	E4011		0.0	CVA	2000	400	4		E4000III	40	0.0	CVV	2 000	204	96	0.0	ф 45.50	ф 405.00	<b>#</b> 40	07.4	10
13 201	112 Classrom	9	S 32 P F 2 (ELE) T 32 R F 3 (ELE)	F42LL F43ILL/2	60 90	0.2	SW C-OCC	2000 2400	480 1,944		0	F42SSILL F43SSILL	72	0.2	SW C-OCC	2,000 2,400	384 1,555		0.0	\$ 15.52 \$ 60.50	· ·	T	27.4 15.8	4.0 2.1
258 201	112 Classrom 107 Storage	3	CFQ13W T 32 R F 3 (ELE)	CFQ13/2-L F43ILL/2	28 90	0.1	C-OCC SW	2400 1000	202 90		CFQ13W	CFQ13/2-L F43SSILL	28	0.1	C-OCC SW	2,400 1,000	202 72		0.0	\$ - \$ 3.57	\$ - \$ 106.25	\$0 \$15	29.8	#DIV/0! 5.1
13	Elec		S 32 P F 2 (ELE)	F42LL	60	0.2	SW	1000	240	4	0	F42SSILL	48	0.2	SW	1,000	192	48	0.0	\$ 9.51	\$ 425.00	\$40	44.7	8.0
199 199	Boy's TR Girl's TR		W 32 C F 1 (ELE) W 32 C F 1 (ELE)	F41LL F41LL	32 32	0.0	SW SW	2000	64 64		0	F41SSILL F41SSILL	26 26	0.0	SW	2,000 2,000	52 52		0.0	\$ 1.94 \$ 1.94	\$ 106.25 \$ 106.25	<del> </del>	54.8 54.8	7.6 7.6
201	106 Storage	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	C-OCC	1000	180	2	0	F43SSILL	72	0.1	C-OCC	1,000	144	36	0.0	\$ 7.13	\$ 212.50	\$30	29.8	5.1
201 201	106 IDF Room New Wing Corridor	13	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90	0.1	C-OCC SW	2400 2280	216 2,668	13	0	F43SSILL F43SSILL	72 72	0.1	C-OCC SW	2,400 2,280	2,134			\$ 6.72 \$ 83.87	<u> </u>	+	15.8 16.5	2.1
256	Gym Gym	30	T 32 R F 5 (ELE)	F45ILL	148	4.4 0.2	SW SW	2000	8,880	30	F45T8	F45SILL F42SSILL	120	3.6 0.3	SW SW	2,000	7,200			\$ 271.60	. ,	+	13.6	2.2
198 254	210 Science	24	2T 17 R F 2 (ELE) REFLECTOR T 32 R F 4 (ELE)	F22LL F44LL	118	2.8	C-OCC	2000 2400	372 6,797	24	T 32 R F 4 (ELE)	F44LL	118	2.8	C-OCC	2,000 2,400	576 6,797	(=0.7	0.0	\$ (32.98) \$ -	\$ 637.50 \$ -	\$0		#DIV/0!
254 7	Prep Vivarium	4	T 32 R F 4 (ELE) 2T 32 R F 2 (u) (ELE) Thin Tube	F44LL FU2LL	118 60	0.5	SW SW	2400 2400	1,133 576	4 4	T 32 R F 4 (ELE) 2T 17 R F 2 (ELE)	F44LL F22ILL	118	0.5	SW	2,400 2,400	1,133 317		0.0	\$ - \$ 40.33	\$ - \$ 405.00	\$0 \$0	10.0	#DIV/0!
254	208 Science	22	T 32 R F 4 (ELE)	F44LL	118	2.6	C-OCC	2400	6,230		T 32 R F 4 (ELE)	F44LL	118	2.6	C-OCC	2,400	6,230	-	0.0	\$ -	\$ -	\$0	10.0	#DIV/0!
254 7	Boy's TR Boy's TR	1	T 32 R F 4 (ELE) 2T 32 R F 2 (u) (ELE) Thin Tube	F44LL FU2LL	118 60	0.2	SW SW	2000	472 120		T 32 R F 4 (ELE) 2T 17 R F 2 (ELE)	F44LL F22ILL	118 33	0.2	SW	2,000 2,000	472 66	54	0.0	\$ - \$ 8.73	\$ - \$ 101.25	\$0 \$0	11.6	#DIV/0! 1.9
55	Corridor Corridor	6	2T 17 R F 3 (ELE)	F23ILL	47	0.3	SW	2280	643	6	2T 17 R F 3 (ELE)	F23ILL	47	0.3	SW	2,280	643	-	0.0	\$ -	\$ -	\$0		#DIV/0!
55 258	Corridor	5	2T 17 R F 3 (ELE) CFQ13W	F23ILL CFQ13/2-L	47 28	0.6	SW SW	2280 2280	1,286 319	5	2T 17 R F 3 (ELE) CFQ13W	F23ILL CFQ13/2-L	28	0.6	SW SW	2,280 2,280	1,286 319	-	0.0	φ - \$ -	э - \$ -	φυ \$0		#DIV/0! #DIV/0!
13 201	Girl's TR 206 SGI	4 7	S 32 P F 2 (ELE) T 32 R F 3 (ELE)	F42LL F43ILL/2	60 90	0.2	SW C-OCC	2000 2400	480 1,512	4 7	0	F42SSILL F43SSILL	48	0.2 0.5	SW C-OCC	2,000 2.400	384 1,210		0.0	\$ 15.52 \$ 47.05	\$ 425.00 \$ 743.75	Ŧ · ·	27.4 15.8	4.0
13	Girl's TR	8	S 32 P F 2 (ELE)	F42LL	60	0.5	SW	2000	960	8	0	F42SSILL	48	0.4	SW	2,000	768	192	0.1	\$ 31.04	\$ 850.00	\$80	27.4	4.0
13 13	Boy's TR Cust Closet	8	S 32 P F 2 (ELE) S 32 P F 2 (ELE)	F42LL F42LL	60 60	0.5 0.1	SW SW	2000 500	960	8	0	F42SSILL F42SSILL	48	0.4	SW SW	2,000 500	768 24		0.1	\$ 31.04 \$ 1.63	•	+ '	27.4 65.4	4.0 16.0
254	Storage	4	T 32 R F 4 (ELE)	F44LL	118	0.5	SW	1000	472	4	T 32 R F 4 (ELE)	F44LL	118	0.5	SW	1,000	472	-	0.0	\$ -	\$ -	\$0		#DIV/0!
201 7	202 SGI 202 SGI	1	T 32 R F 3 (ELE) 2T 32 R F 2 (u) (ELE) Thin Tube	F43ILL/2 FU2LL	90	0.5 0.1	C-OCC	2400 2400	1,080 144	1	2T 17 R F 2 (ELE)	F43SSILL F22ILL	33	0.4	C-OCC	2,400 2,400	864 79	216 65		\$ 33.61 \$ 10.08	\$ 531.25 \$ 101.25	+ '	15.8 10.0	2.1 1.6
201 201	213 Classroom 214 Classroom	12	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90 90	1.1	C-OCC	2400 2400	2,592 2,592	12	0	F43SSILL F43SSILL	72	0.9 0.9	C-OCC C-OCC	2,400 2,400	2,074 2,074			\$ 80.66 \$ 80.66	\$ 1,275.00 \$ 1,275.00	+ -	15.8 15.8	2.1 2.1
254	Sprinkler Room	1	T 32 R F 4 (ELE)	F44LL	118	0.1	SW	1000	118	1	T 32 R F 4 (ELE)	F44LL	118	0.1	SW	1,000	118	-	0.0	\$ -	\$ 1,273.00	\$0	13.0	#DIV/0!
257 7	231 Library 231 Library		CFT40W 2T 32 R F 2 (u) (ELE) Thin Tube	CFT40/2-BX FU2LL	72 60	4.3	SW SW	2400 2400	10,368 2,880	60 20	CFT40W 2T 17 R F 2 (ELE)	CFT40/2-BX F22ILL	72 33	4.3 0.7	SW	2,400 2,400	10,368 1,584		0.0	\$ - \$ 201.66	\$ - \$ 2,025.00	\$0 \$0	10.0	#DIV/0!
199	231 Library	6	W 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	461	6	0	F41SSILL	26	0.2	SW	2,400	374	86		\$ 13.44	,		47.4	6.3
257 254	227 Tech Service Lab Copy Room	27	CFT40W T 32 R F 4 (ELE)	CFT40/2-BX F44LL	72 118	0.3	SW	2400 2400	7,646	·	T 32 R F 4 (ELE)	CFT40/2-BX F44LL	72 118	0.3 3.2	SW	2,400 2,400	691 7,646		0.0	\$ -	\$ -	\$0 \$0		#DIV/0! #DIV/0!
257 254	230 Team Planning Network	5	CFT40W T 32 R F 4 (ELE)	CFT40/2-BX F44LL	72 118	0.4	SW SW	2400 500	864 118	5	CFT40W T 32 R F 4 (ELE)	CFT40/2-BX F44LL	72	0.4	SW SW	2,400 500	864 118		0.0	\$ - \$ -	\$ -	\$0 \$0		#DIV/0! #DIV/0!
55	Corridor	6	2T 17 R F 3 (ELÉ)	F23ILL	47	0.2	SW	2280	643	6	2T 17 R F 3 (ELÉ)	F23ILL	47	0.3	SW	2,280	643		0.0	\$ -	\$ -	\$0		#DIV/0!
254 13	226 Office 224 Computer Lab	2 24	T 32 R F 4 (ELE) S 32 P F 2 (ELE)	F44LL F42LL	118 60	0.2	C-OCC SW	2400 2400	566 3,456	24	T 32 R F 4 (ELE)	F44LL F42SSILL	118 48	0.2	C-OCC SW	2,400 2,400	566 2,765		0.0	\$ - \$ 107.55	\$ - \$ 2,550.00	\$0 \$240	23.7	#DIV/0! 3.3
13	225 Computer Lab	24	S 32 P F 2 (ELE)	F42LL	60	1.4	SW	2400	3,456	24	0	F42SSILL	48	1.2	SW	2,400	2,765	691	0.0	\$ 107.55	\$ 2,550.00	\$240	23.7	3.3
201 201	216 Classroom 217 Classroom	12	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90	1.1	C-OCC	2400 2400	2,592 2,592	12	0	F43SSILL F43SSILL	72	0.9	C-OCC	2,400 2,400	2,074 2,074		0.2	\$ 80.66 \$ 80.66	\$ 1,275.00 \$ 1,275.00		15.8 15.8	2.1
201 55	219 Classroom 219 Classroom	9	T 32 R F 3 (ELE) 2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	90 47	0.8	C-OCC	2400 2400	1,944 338	9	0 2T 17 R F 3 (ELE)	F43SSILL F23ILL	72	0.6	C-OCC	2,400 2.400	1,555 338		0.2	\$ 60.50	\$ 956.25	\$135	15.8	2.1 #DIV/0!
201	220 Classroom	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	2400	1,944	9	0	F43SSILL	72	0.6	C-OCC	2,400	1,555		0.2	\$ 60.50	\$ 956.25	\$135	15.8	2.1
55 201	220 Classroom 221 Classroom	9	2T 17 R F 3 (ELE) T 32 R F 3 (ELE)	F23ILL F43ILL/2	47 90	0.1	C-OCC	2400 2400	338 1.944	9	2T 17 R F 3 (ELE)	F23ILL F43SSILL	47 72	0.1	C-OCC	2,400 2,400	338 1,555		0.0	\$ - \$ 60.50	\$ - \$ 956.25	\$0 \$135	15.8	#DIV/0! 2.1
55	221 Classroom	3	2T 17 R F 3 (ELÉ)	F23ILL	47	0.1	C-OCC	2400	338	3	2T 17 R F 3 (ELE)	F23ILL	47	0.1	C-OCC	2,400	338	-	0.0	\$ -	\$ -	\$0		#DIV/0!
201 55	222 Classroom 222 Classroom	3	T 32 R F 3 (ELE) 2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	90 47	0.8	C-OCC	2400 2400	1,944 338		2T 17 R F 3 (ELE)	F43SSILL F23ILL	72 47	0.6	C-OCC	2,400 2,400	1,555 338		0.2	\$ 60.50 \$ -	\$ 956.25 \$ -	\$135 \$0	15.8	2.1 #DIV/0!
7 55	Corridor Corridor		2T 32 R F 2 (u) (ÉLE) Thin Tube 2T 17 R F 3 (ELE)	FU2LL F23ILL	60 47	0.6	SW SW	2280 2280	1,368 643	10	2T 17 R F 2 (ELE) 2T 17 R F 3 (ELE)	F22ILL F23ILL	33	0.3	SW SW	2,280 2,280	752 643		0.3	\$ 96.77	\$ 1,012.50	\$0 \$0	10.5	1.6 #DIV/0!
201	223 Classroom	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	2400	2,592	12	0	F43SSILL	72	0.9	C-OCC	2,400	2,074	518	0.2	\$ 80.66	+ ,	<u> </u>	15.8	2.1
201 201	224 Classroom 236 TV Studio	12 11	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90 90	1.1	C-OCC SW	2400 2400	2,592 2,376	12 11	0	F43SSILL F43SSILL	72 72	0.9	C-OCC SW	2,400 2,400	2,074 1,901			\$ 80.66 \$ 73.94	+ ,		15.8 15.8	2.1 2.1
258	235 Control Room		CFQ13W	CFQ13/2-L	28	0.3	SW	2400	806		CFQ13W	CFQ13/2-L	28	0.3	SW	2,400	806	-	0.0	\$ -	\$ -	\$0	-	#DIV/0!
258 220	235 Control Room Cust Closet		CFQ13W S 17 C F 1(ELE)	CFQ13/2-L F21ILL	28 20	0.1	SW SW	2400 500	202 10	1	CFQ13W S 17 C F 1(ELE)	CFQ13/2-L F21ILL	20	0.1	SW	2,400 500	202 10	-	0.0	\$ -	\$ -	<del>Ф</del> О		#DIV/0! #DIV/0!
220 201	204 Elec 237 Classroom	1 15	S 17 C F 1(ELE) T 32 R F 3 (ELE)	F21ILL F43ILL/2	20 90	0.0	SW C-OCC	1000 2400	20 3,240	1 15	S 17 C F 1(ELE)	F21ILL F43SSILL	20	0.0	SW C-OCC	1,000 2,400	20 2,592		0.0	\$ - \$ 100.83	\$ - \$ 1.593.75	\$0 \$225	15.8	#DIV/0!
201	238 Classroom	25	T 32 R F 3 (ELE)	F43ILL/2	90	2.3	C-OCC	2000	4,500	25	0	F43SSILL	72	1.8	C-OCC	2,000	3,600	900		\$ 100.83	\$ 1,593.75	T -	18.3	2.5
254 254	Art Office Art Storage	1 1	T 32 R F 4 (ELE) T 32 R F 4 (ELE)	F44LL F44LL	118 118	0.1	SW SW	2400 1000	283 118	_	T 32 R F 4 (ELE) T 32 R F 4 (ELE)	F44LL F44LL	118  118	0.1	SW	2,400 1,000	283 118		0.0	\$ - \$ -	\$ - \$ -	\$0 \$0		#DIV/0! #DIV/0!
13	Stairs	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2280	274	2	0	F42SSILL	48	0.1	SW	2,280	219		0.0	\$ 8.60	\$ 212.50	•	24.7	3.5
201 254	Stairs 165 Woodshop	22	T 32 R F 3 (ELE) T 32 R F 4 (ELE)	F43ILL/2 F44LL	90	2.6	SW SW	2280 2400	205 6,230	22	0 T 32 R F 4 (ELE)	F43SSILL F44LL	118	0.1 2.6	SW	2,280 2,400	164 6,230		0.0	\$ 6.45 \$ -	\$ 106.25 \$ -	\$0	16.5	2.2 #DIV/0!
7 254	165 Woodshop Finishing Room	1	2T 32 R F 2 (u) (ELE) Thin Tube T 32 R F 4 (ELE)	FU2LL F44LL	60 118	0.1 0.2	SW SW	2400 2400	144 566	1 2	2T 17 R F 2 (ELÉ) T 32 R F 4 (ELE)	F22ILL F44LL	33	0.0	SW SW	2,400 2.400	79 566	65	0.0	\$ 10.08 \$ -	\$ 101.25 \$ -	\$0 \$0	10.0	1.6 #DIV/0!
55	Corridor	9	2T 17 R F 3 (ELÉ)	F23ILL	47	0.4	SW	2280	964	9	2T 17 R F 3 (ELÉ)	F23ILL	47	0.4	SW	2,280	964		0.0	\$ -	\$ -	\$0		#DIV/0!
258 201	Corridor 164 Science	10 25	CFQ13W T 32 R F 3 (ELE)	CFQ13/2-L F43ILL/2	28 90	0.3	SW C-OCC	2280 2400	638 5,400	10 25	CFQ13W	CFQ13/2-L F43SSILL	28   72	0.3 1.8	SW C-OCC	2,280 2,400	638 4,320		0.0 0.5	\$ - \$ 168.05	\$ - \$ 2,656.25	\$0 \$375	15.8	#DIV/0! 2.1
201	164 Office	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	2400	864	4	0	F43SSILL	72	0.3	SW	2,400	691	173	0.1	\$ 26.89			15.8	2.1
55 55	Faculty TR Storage		2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE)	F23ILL F23ILL	47 47	0.0	SW SW	2000 1000	94	1 1	2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE)	F23ILL F23ILL	47	0.0	SW	2,000 1,000	94 47	-	0.0	\$ - \$ -	\$ -	\$0		#DIV/0! #DIV/0!
254 201	Cust Office 162 Classroom	2	T 32 R F 4 (ELE)	F44LL F43ILL/2	118	0.2	C-OCC	2400	566		T 32 R F 4 (ELE)	F44LL F43SSILL	118	0.2	C-OCC	2,400	566 2,074		0.0	\$ -	\$ -	\$0	15.0	#DIV/0!
201	161 Classroom	12	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2	90 90	1.1	C-OCC	2400 2400	2,592 2,592	12	0	F43SSILL	72	0.9	C-OCC	2,400 2,400	2,074	518	0.2	\$ 80.66	\$ 1,275.00 \$ 1,275.00	\$180	15.8 15.8	2.1 2.1
201 201	148 Classroom Stairs	11	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90 90	1.0	C-OCC SW	2400 2280	2,376 205		0	F43SSILL F43SSILL	72 72	0.8	C-OCC SW	2,400 2,280	1,901 164				\$ 1,168.75 \$ 106.25		15.8 16.5	2.1
13	Stairs	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2280	274	2	0	F42SSILL	48	0.1	SW	2,280	219	55	0.0	\$ 8.60	\$ 212.50	\$20	24.7	3.5
201 55	144 Classroom 144 Classroom	9 3	T 32 R F 3 (ELE) 2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	90	0.8	C-OCC	2400 2400	1,944 338		0 2T 17 R F 3 (ELE)	F43SSILL F23ILL	72 47	0.6	C-OCC	2,400 2,400	1,555 338		0.2	\$ 60.50 \$ -	\$ 956.25 \$ -	\$135 \$0	15.8	2.1 #DIV/0!
201	143 Classroom	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	2400	1,944	9	0	F43SSILL	72	0.6	C-OCC	2,400	1,555	389	0.2	\$ 60.50	\$ 956.25	\$135	15.8	2.1
55	143 Classroom	<u> 3</u>	2T 17 R F 3 (ELE)	F23ILL	47	J U.1	C-OCC	2400	338	<u> 3</u>	2T 17 R F 3 (ELE)	F23ILL	41	0.1	C-OCC	2,400	338		υ.υ	Φ -	- Φ	JΦU		#DIV/0!

10/26/2012

**ECM-1 Lighting Replacements** 

Cost of Electricity: \$0.125 \$/kWh

\$6.07 \$/kW

				EVICTING COL	MULTIONS							DETPOSIT C	ONDITIONS	2					CO	ST & SAVIN	CC ANALY	212		
				EXISTING COI	NUTTIONS			<u> </u>	<u> </u>			RETROFIT C		<u> </u>	т -	<del></del>				OI & SAVIN	GS ANALT			
																						NJ Smart Start	Simple Payback	
		No. of			Watts per		Exist	Annual		Number of			Watts per		Retrofit	Annual	Annual	Annual kWh	Annual kW	Annual \$	Retrofit	Lighting	With Out	Simple
	Area Description	Fixtures	Standard Fixture Code	NYSERDA Fixture Cod		kW/Space	Control	Hours	Annual kWh	Fixtures	Standard Fixture Code	Fixture Code	Fixture	kW/Space	Control	Hours	kWh	Saved	Saved	Saved	Cost	Incentive	Incentive	Payback
ield	Unique description of the location -		"Lighting Fixture Code" Example	Code from Table of Standa		(Watts/Fixt) *	Pre-inst.		y (kW/space) *	No. of fixtures	"Lighting Fixture Code" Example	Code from Table of	Value from	(Watts/Fixt) *	Retrofit		(kW/space)			(kWh Saved) *		Prescriptive		Length of time
ode	Room number/Room name: Floor	before the	2T 40 R F(U) = 2'x2' Troff 40 w	Fixture Wattages	Table of	` '	control	hours for the	, , ,	after the retrofit	2T 40 R F(U) = 2'x2' Troff 40	Standard Fixture	Table of	Number of	control	annual hours	* (Annual	Ànnual kWh) -	Annual kW) -	` '	renovations to	Lighting	for	renovations co
	number (if applicable)	retrofit	Recess. Floor 2 lamps U shape		Standard Fixture		device	usage group			w Recess. Floor 2 lamps U shape	Wattages	Standard Fixture	Fixtures)	device	for the usage	Hours)	(Retrofit Annual	(Retrofit Annual		lighting system	Measures	renovations cost to be	to be recovered
					Wattages								Wattages			group		KVVII)	KVV)		System		recovered	
													_										<u> </u> '	
258 55	Corridor Corridor		CFQ13W	CFQ13/2-L	28 47	0.3	SW	2280	766	12	CFQ13W	CFQ13/2-L	28	0.3	SW	2,280 2,280	766		0.0	\$ -	\$ -	\$0		#DIV/0! #DIV/0!
55 201	142 Classroom	9	2T 17 R F 3 (ELE) T 32 R F 3 (ELE)	F23ILL F43ILL/2	90	0.5 0.8	C-OCC	2280 2400	1,072 1,944	9	2T 17 R F 3 (ELE)	F23ILL F43SSILL	72	0.5	C-OCC	2,400	1,072 1,555	_		\$ 60.50	\$ 956.25	\$135	15.8	#DIV/0!
55	142 Classroom	3	2T 17 R F 3 (ELE)	F23ILL	47	0.1	C-OCC	2400	338		2T 17 R F 3 (ELE)	F23ILL	47	0.1	C-OCC	2,400	338		0.0	\$ -	\$ -	\$0		#DIV/0!
201	141 Classroom	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	2400	1,944		0	F43SSILL	72	0.6	C-OCC	2,400	1,555		0.2	\$ 60.50	\$ 956.25	\$135	15.8	2.1
55 201	141 Classroom Stairs	1	2T 17 R F 3 (ELE) T 32 R F 3 (ELE)	F23ILL F43ILL/2	90	0.1	C-OCC SW	2400 2280	338 205	1	2T 17 R F 3 (ELE)	F23ILL F43SSILL	72	0.1	C-OCC SW	2,400 2,280	338 164		0.0	\$ 6.45	\$ 106.25	\$0 \$15	16.5	#DIV/0! 2.2
55	Stairs	2	2T 17 R F 3 (ELE)	F23ILL	47	0.1	SW	2280	214	2	2T 17 R F 3 (ELE)	F23ILL	47	0.1	SW	2,280	214		0.0	\$ -	\$ -	\$0	10.0	#DIV/0!
55	Nurse Waiting	6	2T 17 R F 3 (ELE)	F23ILL	47	0.3	SW	2400	677	6	2T 17 R F 3 (ELE)	F23ILL	47	0.3	SW	2,400	677		0.0	\$ -	\$ -	\$0		#DIV/0!
55 13	147 Nurse Office Exam	2	2T 17 R F 3 (ELE) S 32 P F 2 (ELE)	F23ILL F42LL	60	0.1	SW	2400 3000	226 360	2	2T 17 R F 3 (ELE)	F23ILL F42SSILL	47	0.1	SW	2,400 3,000	226 288		0.0	\$ - \$ 10.77	\$ - \$ 212.50	\$0	19.7	#DIV/0!
257	Cot Area	8	CFT40W	CFT40/2-BX	72	0.6	SW	3000	1,728	8	CFT40W	CFT40/2-BX	72	0.6	SW	3,000	1,728		0.0	\$ -	\$ -	\$0	13.1	#DIV/0!
7	TR		2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2000	120		2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,000	66	54		\$ 8.73	\$ 101.25	\$0	11.6	1.9
55 257	Corridor  Main Office		2T 17 R F 3 (ELE) CFT40W	F23ILL	47 72	0.2	SW	2280	536	_	2T 17 R F 3 (ELE)	F23ILL	47	0.2	SW	2,280	536		0.0	\$ - ¢	\$ -	\$0	+'	#DIV/0!
257 257	135 Assist Prinicpal		CFT40W	CFT40/2-BX CFT40/2-BX	72	0.8	SW	2400	1,901 1,728	10	CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72	0.8	SW	2,400 2,400	1,901 1,728		0.0	ş -	φ - \$ -	\$0	+	#DIV/0! #DIV/0!
257	138 Principal	3	CFT40W	CFT40/2-BX	72	0.2	SW	2400	518	3	CFT40W	CFT40/2-BX	72	0.2	SW	2,400	518	-	0.0	\$ -	\$ -	\$0		#DIV/0!
258	138 Principal		CFQ13W	CFQ13/2-L	28	0.1	SW	2400	202	3	CFQ13W	CFQ13/2-L	28	0.1	SW	2,400	202		0.0	\$ -	\$ -	\$0 \$0		#DIV/0!
55 257	Vest 131 Guidance	4 4	2T 17 R F 3 (ELE) CFT40W	F23ILL CFT40/2-BX	72	0.2	SW	2280 2400	429 691	4	2T 17 R F 3 (ELE) CFT40W	F23ILL CFT40/2-BX	72	0.2	SW	2,280 2,400	429 691		0.0	\$ -	\$ - \$ -	\$0		#DIV/0! #DIV/0!
254	134 Workroom	4	T 32 R F 4 (ELE)	F44LL	118	0.5	SW	2400	1,133	4	T 32 R F 4 (ELE)	F44LL	118	0.5	SW	2,400	1,133		0.0	\$ -	\$ -	\$0		#DIV/0!
257	130 Guidance	4	CFT40W	CFT40/2-BX	72	0.3	SW	2400	691	4	CFT40W	CFT40/2-BX	72	0.3	SW	2,400	691	-	0.0	\$ -	\$ -	\$0		#DIV/0!
7	Women's TR  Men's TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60 60	0.1	SW	2000	120	1	2T 17 R F 2 (ELE) 2T 17 R F 2 (ELE)	F22ILL	33	0.0	SW	2,000	66	54	0.0	\$ 8.73	\$ 101.25 \$ 101.25	\$0	11.6	1.9
<del>/</del> 257	135 Office	6	2T 32 R F 2 (u) (ELE) Thin Tube CFT40W	FU2LL CFT40/2-BX	72	0.1	SW	2400	1.037	6	CFT40W	F22ILL CFT40/2-BX	72	0.0	SW	2,000	1.037	54	0.0	\$ 6.73	\$ 101.25	\$0	11.6	#DIV/0!
257	Child Study Room	11	CFT40W	CFT40/2-BX	72	0.8	SW	2400	1,901	11	CFT40W	CFT40/2-BX	72	0.8	SW	2,400	1,901	-	0.0	\$ -	\$ -	\$0		#DIV/0!
257	129 Child Study Team	4	CFT40W	CFT40/2-BX	72	0.3	SW	2400	691	4	CFT40W	CFT40/2-BX	72	0.3	SW	2,400	691		0.0	\$ -	\$ -	\$0	'	#DIV/0!
254 55	125B Gym Office 125B Gym Office	1 1	T 32 R F 4 (ELE) 2T 17 R F 3 (ELE)	F44LL F23ILL	118 47	0.2	SW	2400 2400	566	2	T 32 R F 4 (ELE) 2T 17 R F 3 (ELE)	F44LL F23ILL	118 47	0.2	SW	2,400 2,400	566 113	-	0.0	\$ - \$ -	\$ -   \$ -	\$0	+	#DIV/0! #DIV/0!
198	Women's TR	1	2T 17 R F 2 (ELE) REFLECTOR	F22LL	31	0.0	SW	2000	62	1	0	F42SSILL	48	0.0	SW	2,000	96	(34)	(0.0)	\$ (5.50)	) \$ 106.25	\$15		-2.7
254	125A Office	2	T 32 R F 4 (ELE)	F44LL	118	0.2	SW	2400	566	2	T 32 R F 4 (ELE)	F44LL	118	0.2	SW	2,400	566		0.0	\$ -	\$ -	\$0		#DIV/0!
55 198	125A Office 125A Office		2T 17 R F 3 (ELE) 2T 17 R F 2 (ELE) REFLECTOR	F23ILL F22LL	47	0.0	SW	2400 2400	113	1	2T 17 R F 3 (ELE)	F23ILL F42SSILL	47	0.0	SW	2,400 2,400	113		(0.0)	\$ -	\$ -	\$0 \$15		#DIV/0! -2.2
257	Weight Room		CFT40W	CFT40/2-BX	72	0.3	SW	1000	288	4	CFT40W	CFT40/2-BX	72	0.3	SW	1,000	288	\ /	0.0	\$ -	\$ -	\$0	+	#DIV/0!
257	Boy's Locker Room	11	CFT40W	CFT40/2-BX	72	0.8	SW	2800	2,218	11	CFT40W	CFT40/2-BX	72	0.8	SW	2,800	2,218	_	0.0	\$ -	\$ -	\$0		#DIV/0!
257 257	Boy's Locker Room TR Girl's Locker Room	4	CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72	0.3	SW	2800	806 1.613	4	CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72	0.3	SW	2,800 2.800	806 1.613	-	0.0	\$ - ¢	\$ -   e	\$0		#DIV/0! #DIV/0!
257	Girl's Locker Room TR	4	CFT40W	CFT40/2-BX	72	0.3	SW	2000	576	4	CFT40W	CFT40/2-BX	72	0.3	SW	2,000	576	-	0.0	\$ -	\$ -	\$0	+	#DIV/0!
257	Corridor	8	CFT40W	CFT40/2-BX	72	0.6	SW	2280	1,313	8	CFT40W	CFT40/2-BX	72	0.6	SW	2,280	1,313		0.0	\$ -	\$ -	\$0		#DIV/0!
257	Faculty Room  Men's TR	11	CFT40W	CFT40/2-BX	72 60	0.8	SW	2400	1,901	11	CFT40W 2T 17 R F 2 (ELE)	CFT40/2-BX	72	0.8	SW	2,400	1,901		0.0	\$ -	\$ -	\$0	11.6	#DIV/0!
7	Women's TR		2T 32 R F 2 (u) (ELE) Thin Tube 2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL FU2LL	60	0.1	SW	2000	120	1 1	2T 17 R F 2 (ELE)	F22ILL F22ILL	33	0.0	SW	2,000	66	-	0.0	\$ 8.73 \$ 8.73	\$ 101.25 \$ 101.25	+	11.6 11.6	1.9
201	119 SGI	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2400	1,296	6	0	F43SSILL	72	0.4	C-OCC	2,400	1,037	259	0.1	\$ 40.33	\$ 637.50	\$90	15.8	2.1
7	119 SGI		2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	2400	144	1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	2,400	79	65		\$ 10.08	+ 101120	4 -	10.0	1.6
259 199	Multipurpose Room  Multipurpose Room		CFT40W W 32 C F 1 (ELE)	CFT40/8-BX F41LL	288 32	3.5	SW	3102.5 3102.5	10,722 3,376		CFT40W	CFT40/8-BX F41SSILL	268	3.5 0.9	SW	3,103 3,103	10,722 2,743		0.0	\$ - \$ 94.13	\$ - \$ 3,612.50	\$0 \$510	38.4	#DIV/0! 4.9
258	Corridor		CFQ13W	CFQ13/2-L	28	0.3	SW	2280	702		CFQ13W	CFQ13/2-L	28	0.3	SW	2,280	702		0.0	\$ -	\$ -	\$0		#DIV/0!
55	Corridor	11	2T 17 R F 3 (ELE)	F23ILL	47	0.5	SW	2280	1,179	11	2T 17 R F 3 (ELE)	F23ILL	47	0.5	SW	2,280	1,179		0.0	\$ -	\$ -	\$0		#DIV/0!
201	114 Music 113 Music	12	T 32 R F 3 (ELE) S 32 P F 2 (ELE)	F43ILL/2 F42LL	90	1.1 2.5	SW	2400 2400	2,592 6,048	12	0	F43SSILL F42SSILL	72 48	0.9 2.0	SW	2,400 2,400	2,074 4,838			\$ 80.66 \$ 188.21	<u> </u>		15.8 23.7	2.1
7	113 Office	12	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	2400	576	4	2T 17 R F 2 (ELE)	F22ILL	33	0.1	SW	2,400	317			\$ 40.33	-	-	10.0	1.6
254	113 Storage	3	T 32 R F 4 (ELE)	F44LL	118	0.4	SW	1000	354		T 32 R F 4 (ELE)	F44LL	118	0.4	SW	1,000	354		0.0	\$ -	\$ -	\$0	Ţ <u></u>	#DIV/0!
201 201	127 Classroom 126 Classroom	12	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90	1.1	C-OCC	2400 2400	2,592 2,592	12	0	F43SSILL F43SSILL	72	0.9	C-OCC	2,400 2,400	2,074 2,074			\$ 80.66 \$ 80.66	· · ·	• •	15.8 15.8	2.1
55	Corridor	10	2T 17 R F 3 (ELE)	F23ILL	47	0.5	SW	2280	1,072	12	2T 17 R F 3 (ELE)	F23ILL	47	0.9	SW	2,400	1,072		0.2	\$ -	\$ 1,275.00	\$0	13.0	#DIV/0!
258	Corridor	7	CFQ13W	CFQ13/2-L	28	0.2	SW	2280	447	7	CFQ13W	CFQ13/2-L	28	0.2	SW	2,280	447	-	0.0	\$ -	\$ -	\$0		#DIV/0!
13	157 Classroom	18	S 32 P F 2 (ELE)	F42LL	60	1.1	C-OCC	2400	2,592	18	0	F42SSILL	48	0.9	C-0CC	2,400	2,074			· ·	\$ 1,912.50	<u> </u>	23.7	3.3
201 201	153 SGI 154 SGI	9 9	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90	0.8	C-OCC	2400 2400	1,944 1,944	9	0	F43SSILL F43SSILL	72	0.6	C-OCC	2,400 2,400	1,555 1,555			\$ 60.50 \$ 60.50	-		15.8 15.8	2.1
13	Boy's TR	12	S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2000	1,440		0	F42SSILL	48	0.6	SW	2,000	1,152			\$ 46.56			27.4	4.0
13	Girl's TR		S 32 P F 2 (ELE)	F42LL	60	0.7	SW	2000	1,440	12	0	F42SSILL	48	0.6	SW	2,000	1,152			\$ 46.56			27.4	4.0
13	158 Classroom <b>Total</b>	18 <b>864</b>	S 32 P F 2 (ELE)	F42LL	60	1.1 <b>68.9</b>	C-OCC	2400	2,592 <b>159,035</b>	18 <b>864</b>	U	F42SSILL	7, <b>397</b>	0.9 <b>60.6</b>	C-OCC	2,400	2,074 <b>140,069</b>	518 <b>18,966</b>	0.2 <b>8.3</b>	\$ 80.66 <b>\$2,977</b>	\$ 1,912.50 <b>\$49,929</b>		23.7	3.3
L	i Otai	004			<u> </u>	00.3	1	I	103,000	004	<u> </u>	<u> </u>	। ,उद्या	00.0	1	<u> </u>	· · · · · · · · · · · · · · · · · · ·	nd Savings	บเจ	8.3	\$49,929 \$601	ψυ,υπυ	+	<b>†</b>
																		n Savings		18,966	\$2,376			

10/26/2012

**ECM-2 Install Occupancy Sensors** 

**Cost of Electricity:** \$0.107 \$/kWh \$6.74 \$/kW **EXISTING CONDITIONS COST & SAVINGS ANALYSIS** RETROFIT CONDITIONS **NJ Smart** Simple Start Payback Number of Annual kWh Annual kW Annual \$ Retrofit Lighting With Out Watts per **Annual** Watts per Retrofit Annual Annual Simple NYSERDA Fixture Code Saved Saved Cost **Area Description Fixtures** Standard Fixture Code Fixture kW/Space Control Hours Annual kWh **Fixtures Standard Fixture Code Fixture Code** Fixture kW/Space Control Hours Saved Incentive Incentive Payback Vatts/Fixt) (kW Saved) \* Unique description of the location - No. of fixtures 'Lighting Fixture Code" Example Code from Table of Standard Value from No. of fixtures Lighting Fixture Code" Example Code from Table of Vatts/Fixt) \* (kW/space) (Original Cost for ength of time Length of time fo Value from Estimated 2T 40 R F(U) 2T 40 R F(U) = 2'x2' Troff 40 w= 2'x2' Troff 40 Standard Fixture Annual kWh) - Annual kW) -Room number/Room name: Floor | before the Fixture Wattages Fixt No.) annual hours Annual Hours) after the retrofit Γable of Number of control annual hours Table of renovations to renovations cost Recess. Floor 2 lamps U shape device (Retrofit Annual (Retrofit Annual number (if applicable) Standard device for the usage w Recess. Floor 2 lamps U shape Standard -ixtures) for the usage Hours) to be recovered renovations Fixture Fixture cost to be Wattages Wattages Boiler Room S 32 P F 2 (ELE) F42LL 0.2 2000 S 32 P F 2 (ELE) F42LL \$0.00 \$0.00 \$0.00 60 SW 60 0.2 SW 2000 #DIV/0! 201 C-OCC 2400 F43ILL/2 90 1,360.8 583.2 \$62.40 \$202.50 \$35.00 112 Classrom T 32 R F 3 (ELE) F43ILL/2 90 8.0 1,944.0 T 32 R F 3 (ELE) 8.0 C-OCC 1680 0.0 2.7 3.2 258 112 Classrom CFQ13W CFQ13/2-L 0.1 C-OCC 2400 201.6 CFQ13W CFQ13/2-L 28 0.1 1680 141.1 \$6.47 \$202.50 \$35.00 31.3 28 25.9 90.0 201 T 32 R F 3 (ELE) T 32 R F 3 (ELE) 90 C-OCC 250 \$202.50 \$35.00 107 Storage F43ILL/2 0.1 SW 1000 F43ILL/2 0.1 28.0 23.2 90 S 32 P F 2 (ELE) S 32 P F 2 (ELE) SW 1000 F42LL 60 0.2 SW 1000 F42LL 60 0.2 240.0 \$0.00 \$0.00 \$0.00 #DIV/0! 199 Boy's TR W 32 C F 1 (ELE) F41LL W 32 C F 1 (ELE F41LL 2000 \$35.00 2000 \$202.50 #DIV/0! 32 0.0 SW 0.0 Girl's TR 32 \$35.00 W 32 C F 1 (ELE) F41LL 32 2000 W 32 C F 1 (ELE) F41LL 2000 \$202.50 0.0 SW 0.0 \$0.00 #DIV/0! 201 106 Storage C-OCC T 32 R F 3 (ELE) F43ILL/2 90 0.2 1000 T 32 R F 3 (ELE) F43ILL/2 90 0.2 250 135.0 \$14.45 \$202.50 \$35.00 14.0 11.6 201 C-OCC 216.0 \$35.00 106 IDF Room T 32 R F 3 (ELE) F43ILL/2 90 0.1 2400 T 32 R F 3 (ELE) F43ILL/2 90 0.1 108.0 \$11.56 \$202.50 17.5 14.5 201 T 32 R F 3 (ELE) F43ILL/2 90 2280 2,667.6 Γ 32 R F 3 (ELE) F43ILL/2 90 1.2 2280 2,667.6 \$0.00 \$202.50 \$35.00 #DIV/0! **New Wing Corridor** 13 1.2 SW 13 256 T 32 R F 5 (ELE) SW 8,880.0 T 32 R F 5 (ELE) 148 2000 8,880.0 \$0.00 \$35.00 Gym 30 F45ILL 148 4.4 2000 30 F45ILL 4.4 \$202.50 #DIV/0! 198 2T 17 R F 2 (ELE) REFLECTOR 0.2 SW 2000 372.0 2T 17 R F 2 (ELE) REFLECTOR 0.2 2000 \$202.50 \$35.00 F22LL F22LL #DIV/0! 254 210 Science T 32 R F 4 (ELE) F44LL C-OCC 6,796.8 T 32 R F 4 (ELE) F44LL \$218.18 \$202.50 118 2400 118 2.8 4,757.8 2.039.0 \$35.00 0.8 24 2.8 24 1680 0.9 254 SW F44LL \$35.00 Prep T 32 R F 4 (ELE) F44LL 118 2400 1,132.8 T 32 R F 4 (ELE) 118 0.5 793.0 \$202.50 0.5 5.6 4.6 2T 32 R F 2 (u) (ELE) Thin Tube FU2LL 2400 576.0 2T 32 R F 2 (u) (ELE) Thin Tube FU2LL 60 \$18.49 \$202.50 \$35.00 Vivarium 60 0.2 SW 0.2 11.0 9.1 \$35.00 T 32 R F 4 (ELE) C-OCC 208 Science 22 F44LL 118 2.6 2400 6,230.4 22 T 32 R F 4 (ELE) F44LL 118 2.6 1680 4,361.3 1,869.1 0.0 \$200.00 \$202.50 1.0 8.0 F44LL Boy's TR Γ 32 R F 4 (ELE) F44LL 118 0.2 SW 2000 472.0 T 32 R F 4 (ELE 118 0.2 2000 472.0 \$202.50 \$35.00 #DIV/0! Boy's TR 2T 32 R F 2 (u) (ELE) Thin Tube FU2LL 60 0.1 SW 2000 2T 32 R F 2 (u) (ELE) Thin Tube FU2LL 60 0.1 2000 \$202.50 \$35.00 #DIV/0! 2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE) F23ILL \$35.00 Corridor F23ILL 0.3 SW 2280 47 0.3 2280 643.0 \$0.00 \$202.50 #DIV/0! 2T 17 R F 3 (ELE) F23ILL 1,285.9 2T 17 R F 3 (ELE 2280 1,285.9 \$35.00 Corridor 2280 F23ILL 47 \$202.50 #DIV/0! 12 47 0.6 SW 0.6 \$35.00 CFQ13W CFQ13/2-L 2280 319.2 CFQ13W CFQ13/2-L 28 2280 319.2 \$202.50 Corridor 28 0.1 SW 0.1 \$0.00 #DIV/0! Girl's TR S 32 P F 2 (ELE) F42LL SW 2000 480.0 S 32 P F 2 (ELE) F42LL 60 0.2 2000 \$202.50 \$35.00 #DIV/0! 60 0.2 \$0.00 206 SGI C-OCC T 32 R F 3 (ELE) 2400 T 32 R F 3 (ELE) F43ILL/2 90 1,058.4 453.6 \$202.50 \$35.00 F43ILL/2 90 0.6 0.6 1680 4.2 3.5 Girl's TR S 32 P F 2 (ELE) S 32 P F 2 (ELE) 60 2000 960.0 F42LL 0.5 2000 960.0 \$0.00 \$202.50 \$35.00 F42LL 60 0.5 SW #DIV/0! Boy's TR S 32 P F 2 (ELE) SW 960.0 S 32 P F 2 (ELE) F42LL 60 **C-OCC** 2000 960.0 \$35.00 F42LL 60 0.5 2000 0.5 \$0.00 \$202.50 #DIV/0! 30.0 **Cust Closet** S 32 P F 2 (ELE) F42LL 0.1 SW 500 S 32 P F 2 (ELE) F42LL 60 0.1 SW \$0.00 \$0.00 0.0 0.0 T 32 R F 4 (ELE) F44LL 118 0.5 SW 1000 472.0 T 32 R F 4 (ELE) F44LL 118 0.5 354.0 \$37.88 \$202.50 \$35.00 Storage 250 5.3 4.4 202 SGI T 32 R F 3 (ELE) F43ILL/2 C-OCC 2400 1,080.0 T 32 R F 3 (ELE) F43ILL/2 756.0 \$35.00 90 0.5 0.5 \$202.50 5.8 4.8 202 SGI 2T 32 R F 2 (u) (ELE) Thin Tube C-OCC 2400 2T 32 R F 2 (u) (ELE) Thin Tube 60 \$202.50 \$35.00 FU2LL 60 0.1 FU2LL 0.1 43.8 36.2 C-OCC 2,592.0 90 777.6 2.0 213 Classroom T 32 R F 3 (ELE) F43ILL/2 90 1.1 2400 T 32 R F 3 (ELE) F43ILL/2 C-OCC 1680 1,814.4 0.0 \$83.20 \$202.50 \$35.00 2.4 1.1 214 Classroom 32 R F 3 (ELE) F43ILL/2 90 C-OCC 2400 2,592.0 Γ32 R F 3 (ELE F43ILL/2 90 1,814.4 \$202.50 \$35.00 2.0 2.4 Sprinkler Room 32 R F 4 (ELE) F44LL 118.0 32 R F 4 (ELE) F44LL SW 1000 #DIV/0! 0.1 231 Library 60 CFT40W CFT40/2-BX 4.3 SW 2400 10,368.0 60 CFT40W CFT40/2-BX 4.3 1680 3,110.4 \$332.81 \$202.50 \$35.00 0.6 2T 32 R F 2 (u) (ELE) Thin Tube 2T 32 R F 2 (u) (ELE) Thin Tube 231 Library 2400 2,880.0 FU2LL 2,016.0 864.0 \$202.50 \$35.00 1.8 FU2LL 60 1.2 1.2 2.2 F41LL 32 SW 2400 W 32 C F 1 (ELE) F41LL 32 C-OCC 1680 322.6 138.2 \$14.79 \$202.50 \$35.00 231 Library W 32 C F 1 (ELE) 0.2 460.8 6 0.2 13.7 11.3 227 Tech Service Lab CFT40/2-BX 691.2 CFT40/2-BX 4 CFT40W 0.3 SW 2400 CFT40W 72 0.3 C-OCC 1200 345.6 \$36.98 \$202.50 \$35.00 5.5 4.5 72 T 32 R F 4 (ELE) F44LL SW 2400 7,646.4 T 32 R F 4 (ELE) F44LL 3,823.2 \$409.08 0.5 0.4 Copy Room 118 3.2 118 3.2 3,823.2 \$202.50 \$35.00 CFT40/2-BX 864.0 CFT40/2-BX C-OCC 1200 230 Team Planning CFT40W 72 0.4 SW 2400 CFT40W 72 0.4 432.0 432.0 \$46.22 \$202.50 \$35.00 4.4 3.6 \$0.00 T 32 R F 4 (ELE) F44LL SW 500 118.0 T 32 R F 4 (ELE) F44LL 118 SW 0.0 118.0 0.0 0.0 Network 118 0.2 0.2 \$12.63 \$0.00 2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE) F23ILL 0.3 SW 2280 F23ILL 47 0.3 \$202.50 \$35.00 #DIV/0! Corridor **C-OCC** 2280 643.0 226 Office T 32 R F 4 (ELE) F44LL C-OCC 566.4 T 32 R F 4 (ELE) F44LL C-OCC 1200 118 0.2 2400 118 0.2 283.2 283.2 \$30.30 \$202.50 \$35.00 6.7 5.5 224 Computer Lab F42LL 2.419.2 S 32 P F 2 (ELE) 60 1.4 SW 2400 3,456.0 24 S 32 P F 2 (ELE) F42LL 60 1.4 1.036.8 \$110.94 \$202.50 \$35.00 1.8 1.5 225 Computer Lab 24 S 32 P F 2 (ELE) F42LL 1.4 SW 2400 3,456.0 24 S 32 P F 2 (ELE) F42LL 60 1.4 C-OCC 1680 2,419.2 1.036.8 \$202.50 \$35.00 1.8 1.5 60 0.0 216 Classroom 12 T 32 R F 3 (ELE) F43ILL/2 1.1 C-OCC 2,592.0 T 32 R F 3 (ELE) F43ILL/2 90 C-OCC 1680 1.814.4 \$202.50 \$35.00 2.4 2.0 90 2400 12 1.1 777.6 0.0 \$83.20 2,592.0 217 Classroom T 32 R F 3 (ELE) F43ILL/2 90 1.1 C-OCC 2400 T 32 R F 3 (ELE) F43ILL/2 90 1.1 1.814.4 777.6 \$202.50 \$35.00 2.4 2.0 219 Classroom T 32 R F 3 (ELE) F43ILL/2 C-OCC 2400 1,944.0 T 32 R F 3 (ELE) F43ILL/2 90 C-OCC 1680 1,360.8 583.2 \$202.50 \$35.00 8.0 0.8 \$62.40 3.2 2.7 90 219 Classroom 2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE) C-OCC 2400 338.4 47 0.1 C-OCC 1680 236.9 \$202.50 \$35.00 18.6 15.4 F23ILL 47 0.1 F23ILL 1,944.0 C-OCC T 32 R F 3 (ELE) 1,360.8 220 Classroom T 32 R F 3 (ELE) F43ILL/2 8.0 2400 F43ILL/2 90 8.0 583.2 \$202.50 \$35.00 2.7 90 \$62.40 3.2 220 Classroom F23ILL C-OCC 2400 338.4 2T 17 R F 3 (ELE) F23ILL C-OCC 1680 236.9 101.5 \$202.50 \$35.00 2T 17 R F 3 (ELE) 47 0.1 47 0.1 \$10.86 18.6 15.4 C-OCC 2400 1.944.0 221 Classroom T 32 R F 3 (ELE) F43ILL/2 90 8.0 T 32 R F 3 (ELE) F43ILL/2 90 8.0 C-OCC 1680 1.360.8 583.2 \$62.40 \$202.50 \$35.00 3.2 2.7 F23ILL 221 Classroom 2T 17 R F 3 (ELE) 47 0.1 C-OCC 2400 338.4 2T 17 R F 3 (ELE) F23ILL 47 0.1 236.9 310.86 \$202.50 \$35.00 18.6 15.4 222 Classroom T 32 R F 3 (ELE) F43ILL/2 90 8.0 C-OCC 2400 1.944.0 T 32 R F 3 (ELE) F43ILL/2 90 8.0 C-OCC 1680 1,360.8 583.2 \$62.40 \$202.50 \$35.00 3.2 2.7 222 Classroom 2T 17 R F 3 (ELE) C-OCC 2T 17 R F 3 (ELE) 47 C-OCC 1680 F23ILL 47 0.1 2400 338.4 F23ILL 0.1 236.9 101.5 \$202.50 \$35.00 18.6 15.4 3 \$10.86 Corridor 2T 32 R F 2 (u) (ELE) Thin Tube FU2LL SW 2280 1,368.0 2T 32 R F 2 (u) (ELE) Thin Tube FU2LL C-OCC 2280 \$202.50 \$35.00 #DIV/0! 60 0.6 10 60 0.6 1,368.0 Corridor 2T 17 R F 3 (ELE) F23ILL 643.0 #DIV/0! 47 0.3 SW 2280 2T 17 R F 3 (ELE) F23ILL 47 0.3 2280 \$202.50 \$35.00 \$0.00 223 Classroom F43ILL/2 90 C-OCC 2400 2,592.0 12 T 32 R F 3 (ELE) F43ILL/2 90 1.814.4 \$35.00 T 32 R F 3 (ELE) 1.1 1.1 \$83.20 \$202.50 2.4 2.0 C-OCC 2400 224 Classroom 12 T 32 R F 3 (ELE) F43ILL/2 1.1 2,592.0 12 T 32 R F 3 (ELE) F43ILL/2 90 C-OCC 1680 1.814.4 777.6 0.0 \$83.20 \$202.50 \$35.00 2.4 2.0 90 1.1 236 TV Studio 11 T 32 R F 3 (ELE) F43ILL/2 1.0 SW 2,376.0 11 T 32 R F 3 (ELE) F43ILL/2 90 SW 1680 \$0.00 0.0 0.0 90 2400 1.0 1,663.2 712.8 0.0 \$76.27 \$0.00 CFQ13/2-L 806.4 235 Control Room CFQ13W 28 0.3 SW 2400 12 CFQ13W CFQ13/2-L 0.3 564.5 241.9 \$202.50 \$35.00 7.8 6.5 235 Control Room CFQ13W CFQ13/2-L SW 2400 201.6 CFQ13W CFQ13/2-L 0.1 C-OCC 1680 141.1 60.5 \$202.50 \$35.00 31.3 3 28 0.1 3 28 \$6.47 25.9 Cust Closet S 17 C F 1(ELE SW S 17 C F 1(ELE 0.0 \$202.50 \$35.00 156.5 F21ILL 20 0.0 500 F21ILL 189.3 S 17 C F 1(ELE) 20.0 S 17 C F 1(ELE) 1000 204 Elec F21ILL SW 1000 F21ILL 20 \$202.50 \$35.00 20 0.0 0.0 #DIV/0!

254 254 7 55 55 258 13 201 13 13 254 201 201 254 257 199 257 254 257 254 55 254 13 201 201 201 55 201 55 201 55 201 55 55 201 201 201 258 258 220 220 TT 32 R F 3 (ELE) 201 237 Classroom F43ILL/2 C-OCC 3,240.0 F43ILL/2 \$35.00 15 T 32 R F 3 (ELE) 90 1.4 2400 90 1.4 C-OCC 1680 2,268.0 972.0 \$104.00 \$202.50 1.9 1.6 4,500.0 201 238 Classroom 25 T 32 R F 3 (ELE) F43ILL/2 2.3 C-OCC 2000 25 T 32 R F 3 (ELE) F43ILL/2 90 2.3 2000 4,500.0 \$202.50 \$35.00 #DIV/0! 90 \$0.00 254 F44LL 0.1 SW 283.2 T 32 R F 4 (ELE) Art Office T 32 R F 4 (ELE) 118 2400 F44LL 118 0.1 141.6 141.6 \$15.15 \$202.50 \$35.00 13.4 11.1 1200 254 118.0 T 32 R F 4 (ELE) C-OCC 250 29.5 17.7 Art Storage T 32 R F 4 (ELE) F44LL 118 0.1 SW 1000 F44LL 118 0.1 \$9.47 \$202.50 \$35.00 21.4 273.6 F42LL 13 Stairs S 32 P F 2 (ELE) F42LL 60 0.1 SW 2280 S 32 P F 2 (ELE) 60 0.1 2280 273.6 \$0.00 \$202.50 \$35.00 #DIV/0! 201 T 32 R F 3 (ELE) F43ILL/2 0.1 SW 2280 T 32 R F 3 (ELE) F43ILL/2 90 0.1 **C-OCC** 2280 205.2 \$202.50 \$35.00 #DIV/0! 90 254 165 Woodshop 22 T 32 R F 4 (ELE) F44LL 2.6 SW 2400 6.230.4 T 32 R F 4 (ELE) F44LL 118 2.6 1.869.1 \$200.00 \$202.50 \$35.00 8.0 118 C-OCC | 1680 4.361.3 1.0 165 Woodshop FU2LL SW 2400 12T 32 R F 2 (u) (ELE) Thin Tube FU2LL 60 100.8 \$35.00 2T 32 R F 2 (u) (ELE) Thin Tube 60 0.1 0.1 1680 \$202.50 43.8 36.2 254 Finishing Room T 32 R F 4 (ELE) F44LL 0.2 SW 2400 566.4 T 32 R F 4 (ELE) F44LL 118 0.2 C-OCC 1680 396.5 169.9 0.0 \$18.18 \$202.50 \$35.00 11.1 9.2 118 55 Corridor 2T 17 R F 3 (ELE) F23ILL SW 964.4 2T 17 R F 3 (ELE) F23ILL 47 **C-OCC** 2280 964.4 \$35.00 #DIV/0! 47 0.4 2280 0.4 \$0.00 \$202.50 258 CFQ13/2-L 638.4 CFQ13W Corridor 10 CFQ13W 28 0.3 SW 2280 10 CFQ13/2-L 0.3 2280 \$202.50 \$35.00 #DIV/0! 164 Science C-OCC C-OCC 1680 3,780.0 201 25 T 32 R F 3 (ELE) F43ILL/2 2400 5,400.0 25 T 32 R F 3 (ELE) F43ILL/2 \$173.34 \$202.50 \$35.00 90 2.3 90 2.3 1,620.0 0.0 1.2 1.0 201 164 Office T 32 R F 3 (ELE) SW 2400 864.0 T 32 R F 3 (ELE) 0.4 1200 432.0 \$46.22 \$202.50 \$35.00 3.6 F43ILL/2 90 0.4 F43ILL/2 90 4.4 55 Faculty TR 2T 17 R F 3 (ELE) F23ILL 47 0.0 SW 2000 2T 17 R F 3 (ELE) F23ILL 47 0.0 **C-OCC** 2000 94.0 \$202.50 \$35.00 #DIV/0! 2T 17 R F 3 (ELE) 55 Storage 2T 17 R F 3 (ELE) F23ILL 47 0.0 SW 1000 47.0 F23ILL 47 0.0 C-OCC 250 35.3 \$3.77 \$202.50 \$35.00 53.7 44.4 254 Cust Office T 32 R F 4 (ELE) F44LL 0.2 C-OCC 2400 566.4 T 32 R F 4 (ELE) F44LL 118 0.2 C-OCC 1200 283.2 \$30.30 \$202.50 \$35.00 6.7 5.5 118 201 F43ILL/2 1.1 C-OCC 2,592.0 T 32 R F 3 (ELE) F43ILL/2 C-OCC 1680 777.6 2.0 162 Classroom 12 T 32 R F 3 (ELE) 90 2400 12 90 1.1 1,814.4 \$83.20 \$202.50 \$35.00 2.4 201 C-OCC 2400 2,592.0 161 Classroom 12 T 32 R F 3 (ELE) F43ILL/2 90 1.1 12 T 32 R F 3 (ELE) F43ILL/2 90 1.1 C-OCC 1680 1,814.4 777.6 \$83.20 \$202.50 \$35.00 2.4 2.0 C-OCC 2,376.0 2.7 201 148 Classroom 11 T 32 R F 3 (ELE) F43ILL/2 2400 T 32 R F 3 (ELE) F43ILL/2 90 C-OCC 1680 1,663.2 712.8 \$76.27 \$202.50 \$35.00 2.2 90 1.0 11 1.0 201 T 32 R F 3 (ELE) 0.1 SW 205.2 T 32 R F 3 (ELE) **C-OCC** 2280 205.2 \$202.50 \$35.00 Stairs F43ILL/2 90 2280 F43ILL/2 90 0.1 \$0.00 #DIV/0! Stairs 273.6 S 32 P F 2 (ELE) F42LL 0.1 SW S 32 P F 2 (ELE) F42LL 0.1 2280 \$35.00 #DIV/0! 13 60 2280 60 \$202.50 201 F43ILL/2 C-OCC 1,944.0 T 32 R F 3 (ELE) F43ILL/2 90 1,360.8 \$35.00 144 Classroom T 32 R F 3 (ELE) 90 8.0 2400 8.0 1680 583.2 \$62.40 \$202.50 3.2 2.7 55 144 Classroom 2T 17 R F 3 (ELE) F23ILL 47 0.1 C-OCC 2400 338.4 2T 17 R F 3 (ELE) F23ILL 47 0.1 C-OCC 1680 236.9 101.5 0.0 \$10.86 \$202.50 \$35.00 18.6 15.4 T 32 R F 3 (ELE) 201 143 Classroom F43ILL/2 90 0.8 C-OCC 2400 1,944.0 9 T 32 R F 3 (ELE) F43ILL/2 90 8.0 C-OCC 1680 1,360.8 583.2 \$62.40 \$202.50 \$35.00 3.2 2.7 55 143 Classroom 2T 17 R F 3 (ELE) F23ILL 47 0.1 C-OCC 2400 338.4 2T 17 R F 3 (ELE) F23ILL 47 0.1 C-OCC 1680 236.9 \$202.50 \$35.00 18.6 15.4

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**ECM-2 Install Occupancy Sensors** 

Cost of Electricity: \$0.107 \$/kWh

\$6.74 \$/kW

_				EXISTING CON	IDITIONS							RETROFIT (	CONDITION	S					COS	ST & SAVIN	GS ANALY	SIS		
	Area Description	No. of Fixtures	Standard Fixture Code	NYSERDA Fixture Cod	Watts per le 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
	Jnique description of the location - Room number/Room name: Floor number (if applicable)	before the	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standar Fixture Wattages	rd Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	control a device f	,	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	2T 40 R F(U) = 2'x2' Troff 40	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	`	Retrofit control device	Estimated annual hours for the usage group	`	`	,	(kW Saved) * (\$/kWh)	Cost for renovations to lighting system		Length of time for renovations cost to be recovered	Length of time for renovations cos to be recovered
258 55	Corridor Corridor		CFQ13W 2T 17 R F 3 (ELE)	CFQ13/2-L F23ILL	28 47	0.3 0.5	SW SW	2280 2280	766.1 1,071.6		CFQ13W 2T 17 R F 3 (ELE)	CFQ13/2-L F23ILL	28 47	0.3 0.5	C-OCC	2280 2280	766.1 1,071.6	0.0		\$0.00 \$0.00	\$202.50 \$202.50	\$35.00 \$35.00		#DIV/0! #DIV/0!
201 55	142 Classroom 142 Classroom		T 32 R F 3 (ÈLE) 2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	90 47	0.8	C-OCC	2400 2400	1,944.0 338.4		T 32 R F 3 (ELE) 2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	90 47	0.8	C-OCC	1680 1680	1,360.8 236.9	583.2 101.5		\$62.40 \$10.86	\$202.50 \$202.50	\$35.00 \$35.00	3.2 18.6	2.7 15.4
201	141 Classroom	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	2400	1,944.0	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	1680	1,360.8	583.2	0.0	\$62.40	\$202.50	\$35.00	3.2	2.7
55 201	141 Classroom Stairs		2T 17 R F 3 (ELE) T 32 R F 3 (ELE)	F23ILL F43ILL/2	90	0.1	C-OCC SW	2400 2280	338.4 205.2	,	2T 17 R F 3 (ELE) T 32 R F 3 (ELE)	F23ILL F43ILL/2	90	0.1	C-OCC	1680 2280	236.9 205.2	0.0	0.0	\$10.86 \$0.00	\$202.50 \$202.50	\$35.00 \$35.00	18.6	15.4 #DIV/0!
55 55	Stairs	2	2T 17 R F 3 (ELÉ)	F23ILL F23ILL	47	0.1	SW	2280	214.3		2T 17 R F 3 (ELÉ)	F23ILL F23ILL	47 47	0.1	C-OCC	2280	214.3	0.0 338.4	0.0	\$0.00 \$36.21	\$202.50 \$202.50	\$35.00 \$35.00	F. 6	#DIV/0!
55 55	Nurse Waiting 147 Nurse Office		2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE)	F23ILL F23ILL	47 47	0.3	SW	2400 2400	676.8 225.6		2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE)	F23ILL F23ILL	47	0.3 0.1	C-OCC		338.4 112.8	112.8	+	\$12.07	\$202.50	\$35.00	5.6 16.8	13.9
13 257	Exam Cot Area		S 32 P F 2 (ELE) CFT40W	F42LL CFT40/2-BX	60 72	0.1 0.6	SW SW	3000 3000	360.0 1,728.0		S 32 P F 2 (ELE) CFT40W	F42LL CFT40/2-BX	60 72	0.1 0.6	C-OCC		180.0 864.0	180.0 864.0		\$19.26 \$92.45	\$202.50 \$202.50	\$35.00 \$35.00	10.5 2.2	8.7 1.8
7	TR	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	0.0	C-OCC	2000	120.0	0.0	0.0	\$0.00	\$202.50	\$35.00	۲.۲	#DIV/0!
55 257	Corridor Main Office		2T 17 R F 3 (ELE) CFT40W	F23ILL CFT40/2-BX	47 72	0.2	SW	2280 2400	535.8 1,900.8		2T 17 R F 3 (ELE) CFT40W	F23ILL CFT40/2-BX	72	0.2	C-OCC	2280 1200	535.8 950.4	950.4	0.0	\$0.00 \$101.69	\$202.50 \$202.50	\$35.00 \$35.00	2.0	#DIV/0! 1.6
257	135 Assist Prinicpal 138 Principal		CFT40W CFT40W	CFT40/2-BX	72 72	0.7	SW	2400 2400	1,728.0 518.4	10	CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72 72	0.7	C-OCC	1200	864.0 259.2	864.0 259.2	0.0	\$92.45 \$27.73	\$202.50 \$202.50	\$35.00 \$35.00	2.2 7.3	1.8
257 258	138 Principal		CFQ13W	CFT40/2-BX CFQ13/2-L	28	0.2	SW	2400	201.6		CFQ13W	CF 140/2-BX CFQ13/2-L	28	0.2	C-OCC	1200	100.8	100.8	0.0	\$10.79	\$202.50	\$35.00	18.8	15.5
55 257	Vest 131 Guidance	4	2T 17 R F 3 (ELE) CFT40W	F23ILL CFT40/2-BX	47 72	0.2	SW	2280 2400	428.6 691.2	4	2T 17 R F 3 (ELE) CFT40W	F23ILL CFT40/2-BX	47 72	0.2	C-OCC	2280 1200	428.6 345.6	0.0 345.6	0.0	\$0.00 \$36.98	\$202.50 \$202.50	\$35.00 \$35.00	5.5	#DIV/0! 4.5
254	134 Workroom	4	T 32 R F 4 (ELE)	F44LL	118	0.5	SW	2400	1,132.8	4	T 32 R F 4 (ELE)	F44LL	118	0.5	C-OCC	1200	566.4	566.4	0.0	\$60.60	\$202.50	\$35.00	3.3	2.8
257 7	130 Guidance Women's TR	1	CFT40W 2T 32 R F 2 (u) (ELE) Thin Tube	CFT40/2-BX FU2LL	72 60	0.3	SW	2400	691.2 120.0	<u>4</u> 1	CFT40W 2T 32 R F 2 (u) (ELE) Thin Tube	CFT40/2-BX FU2LL	72 60	0.3	C-OCC	2000 2000	345.6 120.0	345.6 0.0	0.0	\$36.98 \$0.00	\$202.50 \$202.50	\$35.00 \$35.00	5.5	4.5 #DIV/0!
7	Men's TR	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	C-OCC	2000	120.0	0.0	0.0	\$0.00	\$202.50	\$35.00	0.7	#DIV/0!
257 257	135 Office Child Study Room		CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72 72	0.4	SW	2400 2400	1,036.8 1,900.8	6 11	CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72 72	0.4	C-OCC	1200 1200	518.4 950.4	518.4 950.4	0.0	\$55.47 \$101.69	\$202.50 \$202.50	\$35.00 \$35.00	3.7 2.0	1.6
257	129 Child Study Team 125B Gym Office		CFT40W T 32 R F 4 (ELE)	CFT40/2-BX	72	0.3 0.2	SW	2400 2400	691.2 566.4	4	CFT40W T 32 R F 4 (ELE)	CFT40/2-BX	72	0.3	C-OCC	1200	345.6 283.2	345.6 283.2	0.0	\$36.98 \$30.30	\$202.50 \$202.50	\$35.00 \$35.00	5.5 6.7	4.5
254 55	125B Gym Office	_	2T 17 R F 3 (ELE)	F44LL F23ILL	118 47	0.2	SW	2400	112.8		2T 17 R F 3 (ELE)	F44LL F23ILL	118 47	0.2	C-OCC	1200 1200	56.4	56.4		\$6.03	\$202.50	\$35.00	33.6	27.8
198 254	Women's TR 125A Office		2T 17 R F 2 (ELE) REFLECTOR T 32 R F 4 (ELE)	F22LL F44LL	31 118	0.0	SW	2000 2400	62.0 566.4		2T 17 R F 2 (ELE) REFLECTOR T 32 R F 4 (ELE)	F22LL F44LL	31 118	0.0	C-OCC	2000	62.0 283.2	0.0 283.2	0.0	\$0.00 \$30.30	\$202.50 \$202.50	\$35.00 \$35.00	6.7	#DIV/0!
55	125A Office	1	2T 17 R F 3 (ELÉ)	F23ILL	47	0.0	SW	2400	112.8	1	2T 17 R F 3 (ELÉ)	F23ILL	47	0.0	C-OCC	1200	56.4	56.4		\$6.03	\$202.50	\$35.00	33.6	27.8
198 257	125A Office Weight Room		2T 17 R F 2 (ELE) REFLECTOR CFT40W	F22LL CFT40/2-BX	31 72	0.0	SW	2400 1000	74.4 288.0		2T 17 R F 2 (ELE) REFLECTOR CFT40W	F22LL CFT40/2-BX	31 72	0.0	C-OCC	1200 1000	37.2 288.0	37.2 0.0	0.0	\$3.98 \$0.00	\$202.50 \$202.50	\$35.00 \$35.00	50.9	42.1 #DIV/0!
257	Boy's Locker Room	11	CFT40W	CFT40/2-BX	72	0.8	SW	2800	2,217.6	11	CFT40W	CFT40/2-BX	72	0.8	C-OCC	2000	1,584.0	633.6		\$67.80	\$202.50	\$35.00	3.0	2.5
257 257	Boy's Locker Room TR Girl's Locker Room		CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72 72	0.3	SW	2800 2800	806.4 1,612.8		CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72 72	0.3	C-OCC	2000	576.0 1,152.0	230.4 460.8		\$24.65 \$49.31	\$202.50 \$202.50	\$35.00 \$35.00	8.2 4.1	6.8 3.4
257	Girl's Locker Room TR Corridor		CFT40W CFT40W	CFT40/2-BX	72 72	0.3 0.6	SW	2000 2280	576.0 1,313.3		CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72 72	0.3	C-OCC	2000	576.0 1.313.3	0.0	0.0	\$0.00	\$202.50 \$202.50	\$35.00		#DIV/0! #DIV/0!
257 257	Faculty Room		CFT40W	CFT40/2-BX CFT40/2-BX	72	0.8	SW	2400	1,900.8		CFT40W	CFT40/2-BX CFT40/2-BX	72	0.8	C-OCC	2280 1200	950.4	950.4	0.0	\$0.00 \$101.69	\$202.50	\$35.00 \$35.00	2.0	1.6
7	Men's TR Women's TR	1	2T 32 R F 2 (u) (ELE) Thin Tube 2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL FU2LL	60 60	0.1	SW	2000	120.0 120.0		2T 32 R F 2 (u) (ELE) Thin Tube 2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL FU2LL	60 60	0.1	C-OCC	2000 2000	120.0	0.0	0.0	\$0.00 \$0.00	\$202.50 \$202.50	\$35.00 \$35.00		#DIV/0! #DIV/0!
201	119 SGI	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2400	1,296.0	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	1680	907.2	388.8	0.0	\$41.60	\$202.50	\$35.00	4.9	4.0
7 259	119 SGI Multipurpose Room	1 12	2T 32 R F 2 (u) (ELE) Thin Tube CFT40W	FU2LL CFT40/8-BX	60 288	3.5	C-OCC SW	2400 3102.5	144.0 10,722.2	·	2T 32 R F 2 (u) (ELE) Thin Tube CFT40W	FU2LL CFT40/8-BX	60 288	0.1 3.5	C-OCC	1680 1500	100.8 5,184.0	43.2 5,538.2	0.0	\$4.62 \$592.59	\$202.50 \$202.50	\$35.00 \$35.00	43.8 0.3	36.2 0.3
199 258	Multipurpose Room Corridor		W 32 C F 1 (ELE)	F41LL	32	1.1	SW	3102.5	3,375.5	34	W 32 C F 1 (ELE)	F41LL	32	1.1	C-OCC	1500	1,632.0	1,743.5	0.0	\$186.56 \$0.00	\$202.50	\$35.00	1.1	0.9
55	Corridor		CFQ13W 2T 17 R F 3 (ELE)	CFQ13/2-L F23ILL	28 47	0.3	SW	2280 2280	702.2 1,178.8		CFQ13W 2T 17 R F 3 (ELE)	CFQ13/2-L F23ILL	28 47	0.3 0.5	C-OCC	2280 2280	1,178.8	0.0	0.0	\$0.00	\$202.50 \$202.50	\$35.00 \$35.00		#DIV/0! #DIV/0!
201 13	114 Music 113 Music		T 32 R F 3 (ELE) S 32 P F 2 (ELE)	F43ILL/2 F42LL	90	1.1 2.5	SW	2400 2400	2,592.0 6,048.0		T 32 R F 3 (ELE) S 32 P F 2 (ELE)	F43ILL/2 F42LL	90	1.1 2.5	C-OCC	1680 1680	1,814.4 4,233.6	777.6 1,814.4		\$83.20 \$194.14	\$202.50 \$202.50	\$35.00 \$35.00	2.4 1.0	2.0 0.9
7	113 Office		2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	2400	576.0	4	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	C-OCC	1680	403.2	172.8	0.0	\$18.49	\$202.50	\$35.00	11.0	9.1
254 201	113 Storage 127 Classroom	3 12	T 32 R F 4 (ELE) T 32 R F 3 (ELE)	F44LL F43ILL/2	118 90	0.4 1.1	SW C-OCC	1000 2400	354.0 2,592.0		T 32 R F 4 (ELE) T 32 R F 3 (ELE)	F44LL F43ILL/2	118 90	0.4 1.1	C-OCC	250 1680	88.5 1,814.4	265.5 777.6		\$28.41 \$83.20	\$202.50 \$202.50	\$35.00 \$35.00	7.1 2.4	5.9 2.0
201	126 Classroom	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	2400	2,592.0	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	1680	1,814.4	777.6	0.0	\$83.20	\$202.50	\$35.00	2.4	2.0
55 258	Corridor Corridor		2T 17 R F 3 (ELE) CFQ13W	F23ILL CFQ13/2-L	47 28	0.5	SW	2280 2280	1,071.6 446.9		2T 17 R F 3 (ELE) CFQ13W	F23ILL CFQ13/2-L	47 28	0.5 0.2	C-OCC	2280 2280	1,071.6 446.9	0.0		\$0.00 \$0.00	\$202.50 \$202.50	\$35.00 \$35.00		#DIV/0! #DIV/0!
13 201	157 Classroom 153 SGI		S 32 P F 2 (ELE) T 32 R F 3 (ELE)	F42LL F43ILL/2	60 90	1.1 0.8	C-OCC	2400 2400	2,592.0 1,944.0		S 32 P F 2 (ELE) T 32 R F 3 (ELE)	F42LL F43ILL/2	60 90	1.1 0.8	C-OCC	1680 1680	1,814.4 1,360.8	777.6 583.2		\$83.20 \$62.40	\$202.50 \$202.50	\$35.00 \$35.00	2.4 3.2	2.0 2.7
201	154 SGI	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	2400	1,944.0	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	1680	1,360.8	583.2	0.0	\$62.40	\$202.50	\$35.00	3.2	2.7
13 13	Boy's TR Girl's TR		S 32 P F 2 (ELE) S 32 P F 2 (ELE)	F42LL F42LL	60 60	0.7	SW	2000 2000	1,440.0 1,440.0		S 32 P F 2 (ELE) S 32 P F 2 (ELE)	F42LL F42LL	60 60	0.7	C-OCC	2000 2000	1,440.0 1,440.0	0.0	+	\$0.00 \$0.00	\$202.50 \$202.50	\$35.00 \$35.00		#DIV/0! #DIV/0!
13	158 Classroom	18	S 32 P F 2 (ELE)	F42LL	60	1.1	C-OCC	2400	2,592.0	18	S 32 P F 2 (ELE)	F42LL	60	1.1	C-OCC	1680	1,814.4	777.6	0.0	\$83.20	\$202.50	\$35.00	2.4	2.0
L	Total	864		<u> </u>		68.9	1	1	159,035	864	1		1	69			•	43,941 nd Savings		4,702 0.0	\$22,275 \$0	3,850		
																	kWh	Savings		43,941	\$4,702			
																	Tota	I Savings			\$4,702		4.7	3.9

10/26/2012

CHA Project No.24497 ECM-3 Lighting Replacements with Occupancy Sensors **Cost of Electricity:** 

\$0.107 \$/kWh

\$6.74 \$/kW

				EXISTING CON	DITIONS						RETROFIT C	ONDITIONS	S				СО	ST & SAVIN	IGS ANALYSIS			
																				NJ Smart Start	Simple Payback	
	Area Description	No. of Fixtures	Standard Fixture Code	NYSERDA Fixture Code	Watts per	kW/Space	Exist Control	Annual Hours Annual kW	Number of h	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control		Annual kWh	Annual kWh Saved Saved	Annual \$ Saved	Retrofit Cost	Lighting	With Out Incentive	Simple Payback
	Unique description of the location -	No. of fixtures	"Lighting Fixture Code" Example	Code from Table of Standard	d Value from	(Watts/Fixt) *	Pre-inst.	Estimated daily (kW/space) *	No. of fixtures	"Lighting Fixture Code" Example	Code from Table of	Value from	(Watts/Fixt) *	Retrofit	Estimated (k	:W/space)	(Original (Original	(kWh Saved) *	Cost for F	rescriptive L		Length of time for
Code	Room number/Room name: Floor number (if applicable)		2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Fixture Wattages	Table of Standard Fixture	(Fixt No.)	control device	hours for the (Annual Hours) usage group	after the retrofit	` '	Standard Fixture Wattages	Table of Standard Fixture	(Number of Fixtures)	control device		`	Annual kWh) - Annual kW) - (Retrofit Annual kWh)				enovations cost to be	renovations cost to be recovered
					Wattages							Wattages			group		(VVII)				recovered	
13 201	Boiler Room 112 Classrom	4 9	S 32 P F 2 (ELE) T 32 R F 3 (ELE)	F42LL F43ILL/2	60	0.2	SW C-OCC		30 4 4 9	0	F42SSILL F43SSILL	48 72	0.2	SW C-OCC	2,000	384 1.089	96 0.0 855 0.2	\$ 14.15 \$ 104.63		\$ 40 \$ 170	30.0 11.1	27.2 9.5
258 201	112 Classrom 107 Storage	3	CFQ13W T 32 R F 3 (ELE)	CFQ13/2-L F43ILL/2	28	0.1	C-OCC SW	2400 1,94 2400 20 1000 9		CFQ13W	CFQ13/2-L F43SSILL	28	0.1	C-OCC	1,680	141	60 0.0 72 0.0	\$ 6.47 \$ 9.16	\$ 202.50	35	31.3 33.7	25.9 28.2
13 199	Elec Boy's TR	4	S 32 P F 2 (ELE) W 32 C F 1 (ELE)	F42LL F41LL	60	0.2	SW SW	1000 24 2000 6	4 64 1	0	F42SSILL F41SSILL	48 26	0.2	SW C-OCC	1,000 2,000	192 52	48 0.0 12 0.0	\$ 9.02 \$ 1.77	\$ 425.00	40 50	47.1 174.5	42.7 146.2
199 201	Girl's TR 106 Storage	1 2	W 32 C F 1 (ELE) T 32 R F 3 (ELE)	F41LL F43ILL/2	32	2 0.0 0 0.2	SW C-OCC	2000 6	64 1 80 2	0	F41SSILL F43SSILL	26 72	0.0	C-OCC	2,000	52 36	12 0.0 144 0.0	\$ 1.77 \$ 18.32	\$ 308.75	50	174.5 22.7	146.2
201 201	106 IDF Room New Wing Corridor	1 13	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90	0 0.1	C-OCC SW	2400 21 2280 2,66		0 0	F43SSILL F43SSILL	72 72	0.1 0.9	C-OCC	1,200 2,280	86 2,134	130 0.0 534 0.2	\$ 15.32 \$ 76.01		50 5 230	20.1 20.8	16.9 17.8
256 198	Gym Gym	30 6	T 32 R F 5 (ELE) 2T 17 R F 2 (ELE) REFLECTOR	F45ILL F22LL	144 3	3 4.4 1 0.2	SW SW	2000 8,88 2000 37		F45T8 0	F45SILL F42SSILL	120 48	3.6 0.3	C-OCC	2,000 2,000	7,200 576	1,680 0.8 (204) (0.1)	\$ 247.70 \$ (30.08)	· '	35 125	15.7	15.6
254 254	210 Science Prep	24	T 32 R F 4 (ELE) T 32 R F 4 (ELE)	F44LL F44LL	118	3 2.8 3 0.5	C-OCC SW	2400 6,79 2400 1,13		T 32 R F 4 (ELE) T 32 R F 4 (ELE)	F44LL F44LL	118 118	2.8 0.5	C-OCC	1,680 1,680	4,758 793	2,039   0.0 340   0.0	\$ 218.18 \$ 36.36		35 35	0.9 5.6	0.8 4.6
7 254	Vivarium 208 Science	4 22	2T 32 R F 2 (u) (ELE) Thin Tube T 32 R F 4 (ELE)	FU2LL F44LL	60	0.2 3 2.6	SW C-OCC	2400 57 2400 6,23	76 4 30 22	2T 17 R F 2 (ELE) T 32 R F 4 (ELE)	F22ILL F44LL	33 118	0.1 2.6	C-OCC	1,680 1,680	222 4,361	354   0.1 1,869   0.0	\$ 46.64 \$ 200.00		35 35	13.0 1.0	12.3 0.8
254 7	Boy's TR Boy's TR	1	T 32 R F 4 (ELE) 2T 32 R F 2 (u) (ELE) Thin Tube	F44LL FU2LL	118	0.2	SW SW	2000 12	72 2 20 1	T 32 R F 4 (ELE) 2T 17 R F 2 (ELE)	F44LL F22ILL	118 33	0.2	C-OCC	2,000 2,000	472 66	- 0.0 54 0.0	\$ - \$ 7.96	\$ 202.50 \$ 303.75	35 35	38.2	33.8
55 55	Corridor Corridor	6 12	2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE)	F23ILL F23ILL	4	7 0.3 7 0.6	SW SW	2280 1,28		2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE)	F23ILL F23ILL	47 47	0.3 0.6	C-OCC	2,280 2,280	643 1,286	- 0.0 - 0.0	\$ - \$ -	\$ 202.50 \$ 202.50	35 35		
258 13	Corridor Girl's TR	5 4	CFQ13W S 32 P F 2 (ELE)	CFQ13/2-L F42LL	6	0.1	SW	2000 48	9 5 30 4	CFQ13W 0	CFQ13/2-L F42SSILL	28 48	0.1	C-OCC	2,280 2,000	319 384	- 0.0 96 0.0	\$ - \$ 14.15	T	35 75	44.3	39.0
201 13	206 SGI Girl's TR	7 8	T 32 R F 3 (ELE) S 32 P F 2 (ELE)	F43ILL/2 F42LL	90	0.6	C-OCC SW	2400 1,51 2000 96	8 0	0 0	F43SSILL F42SSILL	72 48	0.5 0.4	C-OCC	1,680 2,000	847 768	665   0.1 192   0.1	\$ 81.38 \$ 28.31	\$ 1,052.50	140	11.6 37.2	9.9
13 13	Boy's TR Cust Closet	8	S 32 P F 2 (ELE) S 32 P F 2 (ELE)	F42LL F42LL	60	0 0.5	SW	2000 96 500 3	30 1	0	F42SSILL F42SSILL	48 48	0.4	C-OCC SW	2,000	768 -	192   0.1 30   0.0	\$ 28.31 \$ 4.18	\$ 106.25	115	37.2 25.4	33.1 23.0
254 201	Storage 202 SGI	5	T 32 R F 4 (ELE) T 32 R F 3 (ELE)	F44LL F43ILL/2	90	0.5	SW C-OCC	2400 1,08		T 32 R F 4 (ELE)	F44LL F43SSILL	118 72	0.5	C-OCC	250 1,680	118 605	354   0.0 475   0.1	\$ 37.88 \$ 58.13	\$ 733.75	35	5.3 12.6	10.7
7 201	202 SGI 213 Classroom	1 12	2T 32 R F 2 (u) (ELE) Thin Tube T 32 R F 3 (ELE)	FU2LL F43ILL/2	90	0.1	C-OCC	2400 2,59		2T 17 R F 2 (ELE)	F22ILL F43SSILL	33 72	0.0	C-OCC	1,680	55 1,452	89   0.0 1,140   0.2	\$ 11.66 \$ 139.50	\$ 1,477.50	35 215	26.1 10.6	23.0 9.1
201 254	214 Classroom Sprinkler Room	12	T 32 R F 3 (ELE) T 32 R F 4 (ELE)	F43ILL/2 F44LL	118	0 1.1 3 0.1	C-OCC SW	2400 2,59 1000 11	8 1	0 T 32 R F 4 (ELE)	F43SSILL F44LL	72 118	0.9	SW	1,680	1,452	1,140 0.2	\$ 139.50 \$ -	\$ -	5 215	10.6	9.1
257 7	231 Library 231 Library	60	CFT40W  2T 32 R F 2 (u) (ELE) Thin Tube	CFT40/2-BX FU2LL	60	2 4.3 0 1.2	SW	2400 10,36 2400 2,88 2400 46	30 20	CFT40W 2T 17 R F 2 (ELE)	CFT40/2-BX F22ILL	72 33	4.3 0.7	C-OCC	1,680	7,258 1,109	3,110   0.0 1,771   0.5	\$ 332.81 \$ 233.19	\$ 2,227.50	35	9.6	0.5 9.4
199 257	231 Library 227 Tech Service Lab	4	W 32 C F 1 (ELE)  CFT40W	F41LL CFT40/2-BX	7:	2 0.2 2 0.3	SW	2400 69	91 4	0 CFT40W	F41SSILL CFT40/2-BX	26 72	0.2	C-OCC	1,680	346	199   0.0 346   0.0	\$ 24.17 \$ 36.98	\$ 202.50	35	34.7 5.5	29.6
254 257	Copy Room 230 Team Planning	5	T 32 R F 4 (ELE)  CFT40W  T 32 R F 4 (ELE)	F44LL CFT40/2-BX	7:	3.2	SW SW SW		54 5	T 32 R F 4 (ELE) CFT40W	F44LL CFT40/2-BX	118 72	3.2 0.4	C-OCC	1,200	3,823 432	3,823 0.0 432 0.0	\$ 409.08 \$ 46.22	\$ 202.50	35	0.5 4.4	0.4 3.6
254 55	Network Corridor 226 Office	6	2T 17 R F 3 (ELE) T 32 R F 4 (ELE)	F44LL F23ILL F44LL	4'	7 0.3	SW C-OCC		3 6	T 32 R F 4 (ELE) 2T 17 R F 3 (ELE)	F44LL F23ILL F44LL	118 47	0.2	C-OCC	2,280	643	118 0.0	\$ 12.63 \$ -	\$ 202.50	35	6.7	5.5
254 13	224 Computer Lab 225 Computer Lab	24	S 32 P F 2 (ELE) S 32 P F 2 (ELE)	F42LL F42LL	60	0.2	SW	2400 3,45 2400 3,45 2400 3,45	66 24	T 32 R F 4 (ELE)	F42SSILL F42SSILL	118 48 48	1.2	C-OCC	1,680	1,935	283   0.0 1,521   0.3 1,521   0.3	\$ 30.30 \$ 186.00 \$ 186.00	\$ 2,752.50	275	14.8 14.8	13.3
201	216 Classroom 217 Classroom	12	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90	0 1.1	C-OCC	2400 3,45 2400 2,59 2400 2,59	12	0	F43SSILL F43SSILL	72 72	0.9	C-OCC	1,680	1,452 1,452	1,140 0.2 1,140 0.2	\$ 139.50 \$ 139.50	\$ 1,477.50	215	10.6	9.1
201 55	219 Classroom 219 Classroom	9	T 32 R F 3 (ELE)  2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	90	0 0.8	C-OCC	2400 2,00 2400 1,94 2400 33	9	0 2T 17 R F 3 (ELE)	F43SSILL F23ILL	72	0.6	C-OCC	1,680	1,089	855 0.2 102 0.0	\$ 104.63 \$ 10.86	\$ 1,158.75	170	11.1	9.5 15.4
201 55	220 Classroom 220 Classroom	9	T 32 R F 3 (ELE)  2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	90	0 0.8	C-OCC	2400 1,94		0 2T 17 R F 3 (ELE)	F43SSILL F23ILL	72	0.6	C-OCC	1,680	1,089	855 0.2 102 0.0	\$ 104.63 \$ 10.86	\$ 1,158.75	170 35	11.1	9.5
201 55	221 Classroom 221 Classroom	9	T 32 R F 3 (ELE) 2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	90	0 0.8	C-OCC	2400 33 2400 1,94 2400 33	9	0 2T 17 R F 3 (ELE)	F43SSILL F23ILL	72	0.6	C-OCC	1,680	1,089	855 0.2 102 0.0	\$ 104.63 \$ 10.86	<u> </u>	170 35	11.1	9.5
201 55	222 Classroom 222 Classroom	9 3	T 32 R F 3 (ELE) 2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	90	0 0.8	C-OCC	2400 1,94 2400 33	9	0 2T 17 R F 3 (ELE)	F43SSILL F23ILL	72	0.6	C-OCC	1,680	1,089	855 0.2 102 0.0	\$ 104.63 \$ 10.86	\$ 1,158.75	170	11.1	9.5
7 55	Corridor Corridor	10	2T 32 R F 2 (u) (ELE) Thin Tube 2T 17 R F 3 (ELE)	FU2LL F23ILL	60	0.6	SW	2280 1,36	68 10 13 6	2T 17 R F 2 (ELE) 2T 17 R F 3 (ELE)	F22ILL F23ILL	33	0.3	C-OCC	2,280	752 643	616 0.3 - 0.0	\$ 87.71 \$ -	'	35	13.9	13.5
201 201	223 Classroom 224 Classroom	12 12	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90	) 1.1 ) 1.1	C-OCC C-OCC	2400 2,59 2400 2,59		0 0	F43SSILL F43SSILL	72 72	0.9	C-OCC	1,680 1,680	1,452 1,452	1,140 0.2 1,140 0.2	\$ 139.50 \$ 139.50	\$ 1,477.50	215	10.6 10.6	9.1 9.1
201 258	236 TV Studio 235 Control Room	11 12	T 32 R F 3 (ELE) CFQ13W	F43ILL/2 CFQ13/2-L	90	1.0 3 0.3	SW SW	2400 2,37 2400 80		0 CFQ13W	F43SSILL CFQ13/2-L	72 28	0.8	SW C-OCC	1,680 1,680	1,331 564	1,045 0.2 242 0.0	\$ 127.88 \$ 25.89		165 35	9.1 7.8	7.8 6.5
258 220	235 Control Room Cust Closet	3	CFQ13W S 17 C F 1(ELE)	CFQ13/2-L F21ILL	20	0.1	SW SW	2400 20 500 1	02 3 0 1	CFQ13W S 17 C F 1(ELE)	CFQ13/2-L F21ILL	28 20	0.1 0.0	C-OCC	1,680	141	60 0.0 10 0.0	\$ 6.47 \$ 1.07	\$ 202.50	35 35	31.3 189.3	25.9 156.5
220 201	204 Elec 237 Classroom	1 15	S 17 C F 1(ELE) T 32 R F 3 (ELE)	F21ILL F43ILL/2	90	0.0	SW C-OCC	1000 2 2400 3,24	20 1 40 15	S 17 C F 1(ELE) 0	F21ILL F43SSILL	20 72	0.0 1.1	C-OCC	1,000 1,680	20 1,814	- 0.0 1,426 0.3	\$ - \$ 174.38	+ ,	35 260	10.3	8.8
201 254	238 Classroom Art Office	25 1	T 32 R F 3 (ELE) T 32 R F 4 (ELE)	F43ILL/2 F44LL	90	2.3 3 0.1	C-OCC SW	2000 4,50 2400 28		0 T 32 R F 4 (ELE)	F43SSILL F44LL	72 118	1.8 0.1	C-OCC	2,000 1,200	3,600 142	900 0.5 142 0.0	\$ 132.70 \$ 15.15	\$ 202.50	\$ 410 \$ 35	21.5 13.4	18.5 11.1
254 13	Art Storage Stairs	1 2	T 32 R F 4 (ELE) S 32 P F 2 (ELE)	F44LL F42LL	118	0.1 0 0.1	SW SW	2280 27		T 32 R F 4 (ELE) 0	F44LL F42SSILL	118 48	0.1 0.1	C-OCC	250 2,280	30 219	89 0.0 55 0.0	\$ 9.47 \$ 7.80	\$ 415.00	35 55	21.4 53.2	17.7 46.2
201 254	Stairs 165 Woodshop	1 22	T 32 R F 3 (ELE) T 32 R F 4 (ELE)	F43ILL/2 F44LL	90	0.1 2.6	SW	2280 20 2400 6,23		0 T 32 R F 4 (ELE)	F43SSILL F44LL	72 118	0.1 2.6	C-OCC	2,280 1,680	164 4,361	41 0.0 1,869 0.0	\$ 5.85 \$ 200.00	\$ 202.50	50 35	52.8 1.0	44.3 0.8
7 254	165 Woodshop Finishing Room	1 2	2T 32 R F 2 (u) (ELE) Thin Tube T 32 R F 4 (ELE)	FU2LL F44LL	118	0.1 0.2	SW SW	2400 14 2400 56	66 2	2T 17 R F 2 (ELE) T 32 R F 4 (ELE)	F22ILL F44LL	33 118	0.0 0.2	C-OCC	1,680 1,680	55 396	89 0.0 170 0.0	\$ 11.66 \$ 18.18	\$ 202.50	35 35 35	26.1 11.1	23.0 9.2
55 258	Corridor Corridor	9	2T 17 R F 3 (ELE) CFQ13W	F23ILL CFQ13/2-L	4	7 0.4 3 0.3	SW SW	2280 96 2280 63	88 10	2T 17 R F 3 (ELE) CFQ13W	F23ILL CFQ13/2-L	47 28	0.4	C-OCC	2,280 2,280	964 638	- 0.0 - 0.0	\$ - \$ -	\$ 202.50 \$ 202.50	35 35		
201	164 Science 164 Office	25 4	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90	2.3	C-OCC SW		64 4	0	F43SSILL F43SSILL	72 72	1.8	C-OCC	1,680 1,200	3,024	2,376 0.5 518 0.1	\$ 290.63 \$ 61.29	\$ 627.50	\$ 410 \$ 95	9.8 10.2	8.4 8.7
55 55	Faculty TR Storage	1	2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE)	F23ILL F23ILL	4	7 0.0 7 0.0	SW	_	7 1	2T 17 R F 3 (ELE) 2T 17 R F 3 (ELE)	F23ILL F23ILL	47	0.0	C-OCC	2,000	94 12	- 0.0 35 0.0	\$ - \$ 3.77	· · · · · · · · · · · · · · · · · · ·	35 35	53.7	44.4
254 201	Cust Office 162 Classroom	12	T 32 R F 4 (ELE) T 32 R F 3 (ELE)	F44LL F43ILL/2	90	0.2	C-OCC	2400 2,59		T 32 R F 4 (ELE)	F44LL F43SSILL	118 72	0.2	C-OCC	1,200 1,680	283 1,452	283   0.0 1,140   0.2	\$ 30.30 \$ 139.50	\$ 1,477.50	35 215	6.7 10.6	5.5 9.1
201	161 Classroom 148 Classroom	12	T 32 R F 3 (ELE) T 32 R F 3 (ELE)	F43ILL/2 F43ILL/2	90	) 1.1 ) 1.0	C-OCC	2400 2,37	6 11	0	F43SSILL F43SSILL	72 72	0.9	C-OCC	1,680	1,452	1,140   0.2 1,045   0.2	\$ 139.50 \$ 127.88	\$ 1,371.25	215	10.6	9.1
201 13	Stairs Stairs	2	T 32 R F 3 (ELE) S 32 P F 2 (ELE)	F43ILL/2 F42LL	90	0.1	SW SW	2280 27	05 1 74 2	0	F43SSILL F42SSILL	72 48	0.1	C-OCC	2,280	164 219	41 0.0 55 0.0	\$ 5.85 \$ 7.80	\$ 415.00	50 55	52.8 53.2	44.3 46.2
201 55	144 Classroom 144 Classroom	3	T 32 R F 3 (ELE)  2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	4	0.8	C-OCC	2400 1,94 2400 33	3	0 2T 17 R F 3 (ELE)	F43SSILL F23ILL	72 47	0.6	C-OCC	1,680	1,089	855 0.2 102 0.0	\$ 104.63 \$ 10.86	\$ 202.50	170 S 35	11.1	9.5 15.4
201 55	143 Classroom 143 Classroom	3	T 32 R F 3 (ELE) 2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	4	0.8 7 0.1	C-OCC	2400 1,94 2400 33	14     9       18     3	0 2T 17 R F 3 (ELE)	F43SSILL F23ILL	72 47	0.6	C-OCC	1,680	1,089 237	855   0.2 102   0.0	\$ 104.63 \$ 10.86		35 35	11.1 18.6	9.5 15.4

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CHA Project No.24497
ECM-3 Lighting Replacements with Occupancy Sensors Cost of Electricity: \$0.107 \$/kWh \$6.74 \$/kW **EXISTING CONDITIONS** RETROFIT CONDITIONS COST & SAVINGS ANALYSIS

																			NJ Smart Start	Simple Payback	
	Area Description	No. of Fixtures	Standard Fixture Code	NYSERDA Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours Annual kW	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Annual Hours kWh	Annual kWh Annual kW Saved Saved	Annual \$ Saved	Retrofit Cost	Lighting Incentive	With Out Incentive	Simple Payback
Field	Unique description of the location -	- No. of fixtures	"Lighting Fixture Code" Example	Code from Table of Standard	Value from	(Watts/Fixt) *	Pre-inst.	Estimated daily (kW/space) *	No. of fixtures	"Lighting Fixture Code" Example	Code from Table of	Value from	(Watts/Fixt) *	Retrofit	Estimated (kW/space	o) (Original (Original	(kWh Saved) *	Cost for	Prescriptive	Length of time	Length of time for
Code	Room number/Room name: Floor number (if applicable)		2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Fixture Wattages	Table of Standard Fixture Wattages	(Fixt No.)	control device	hours for the usage group (Annual Hours	after the retrofit	2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Standard Fixture Wattages	Table of Standard Fixture Wattages	•	control device	for the usage Hours) group	Annual kWh) - (Retrofit Annual (Retrofit Annual kWh) kWh)	,	renovations to lighting system	Lighting Measures	for renovations cost to be recovered	renovations cost to be recovered
258	Corridor	12	CFQ13W	CFQ13/2-L	28	0.3	SW		66 12	CFQ13W	CFQ13/2-L	28	0.3	C-OCC	2,280 760	0.0	\$ -	\$ 202.50			
55 201	Corridor 142 Classroom	9	2T 17 R F 3 (ELE) T 32 R F 3 (ELE)	F23ILL F43ILL/2	90	0.5	SW C-OCC	2280 1,0 2400 1,9		2T 17 R F 3 (ELE)	F23ILL F43SSILL	47 72	0.5	C-OCC	2,280 1,072 1,680 1,089		\$ - \$ 104.63	\$ 202.50 \$ 1,158.75		11.1	9.5
55	142 Classroom	3	2T 17 R F 3 (ELE)	F23ILL	47	0.1	C-OCC	+	38 3	2T 17 R F 3 (ELE)	F23ILL	47	0.1	C-OCC	1,680 23		\$ 10.86	\$ 202.50	\$ 35	18.6	15.4
201 55	141 Classroom 141 Classroom	3	T 32 R F 3 (ELE) 2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	47	7 0.8	C-OCC	2400 3	38 3	2T 17 R F 3 (ELE)	F43SSILL F23ILL	72 47	0.6	C-OCC	1,680 1,089 1,680 23	9 855 0.2 7 102 0.0	\$ 104.63 \$ 10.86	\$ 1,158.75 \$ 202.50		11.1 18.6	9.5 15.4
201 55	Stairs Stairs	1	T 32 R F 3 (ELE) 2T 17 R F 3 (ELE)	F43ILL/2 F23ILL	90	0.1	SW SW	2280 2 2280 2	05 1 14 2	0 2T 17 R F 3 (ELE)	F43SSILL F23ILL	72 47	0.1	C-OCC	2,280 16- 2,280 21-	4 41 0.0	\$ 5.85	\$ 308.75 \$ 202.50		52.8	44.3
55	Nurse Waiting	6	2T 17 R F 3 (ELE)	F23ILL	47	7 0.3	SW	2400 6	77 6	2T 17 R F 3 (ELE)	F23ILL	47	0.3	C-OCC	1,200 338	338 0.0	\$ 36.21	\$ 202.50	\$ 35	5.6	4.6
55 13	147 Nurse Office Exam	2	2T 17 R F 3 (ELE) S 32 P F 2 (ELE)	F23ILL F42LL	47 60	0.1	SW		26 2 60 2	2T 17 R F 3 (ELE)	F23ILL F42SSILL	47	0.1	C-OCC	1,200 113	3 113 0.0 4 216 0.0	\$ 12.07 \$ 25.05		<u> </u>	16.8 16.6	13.9 14.4
257	Cot Area	8	CFT40W	CFT40/2-BX	72	0.6	SW	3000 1,7		CFT40W	CFT40/2-BX	72	0.6	C-OCC	1,500 864	4 864 0.0	\$ 92.45	\$ 202.50	\$ 35	2.2	1.8
7 55	TR Corridor	5	2T 32 R F 2 (u) (ELE) Thin Tube 2T 17 R F 3 (ELE)	FU2LL F23ILL	47	0.1	SW	2000 1 2280 5	20 1 36 5	2T 17 R F 2 (ELE) 2T 17 R F 3 (ELE)	F22ILL F23ILL	33 47	0.0	C-OCC	2,000 60 2,280 530	54 0.0 5 - 0.0	\$ 7.96 \$ -	\$ 303.75 \$ 202.50	<u> </u>	38.2	33.8
257	Main Office	11	CFT40W	CFT40/2-BX	72	2 0.8	SW	2400 1,9		CFT40W	CFT40/2-BX	72	0.8	C-OCC	1,200 950	000 0.0	\$ 101.69	\$ 202.50	\$ 35	2.0	1.6
257 257	135 Assist Prinicpal 138 Principal	3	CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72	2 0.7 2 0.2	SW	2400 1,7 2400 5	28 10 18 3	CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72 72	0.7	C-OCC	1,200 864 1,200 259		\$ 92.45 \$ 27.73	<u>'</u>	<u> </u>	7.3	1.8 6.0
258	138 Principal	3	CFQ13W	CFQ13/2-L	28	0.1	SW	2400 2	02 3	CFQ13W	CFQ13/2-L	28	0.1	C-OCC	1,200 10	1 101 0.0	\$ 10.79	'	<u> </u>	18.8	15.5
257	Vest 131 Guidance	4	2T 17 R F 3 (ELE) CFT40W	F23ILL CFT40/2-BX	72	0.2	SW	2280 4 2400 6	91 4	2T 17 R F 3 (ELE) CFT40W	F23ILL CFT40/2-BX	72	0.2	C-OCC	1,200 34	5 346 0.0	\$ 36.98	\$ 202.50 \$ 202.50	<u> </u>	5.5	4.5
254 257	134 Workroom 130 Guidance	4	T 32 R F 4 (ELE) CFT40W	F44LL CFT40/2-BX	118	0.5	SW	2400 1,1 2400 6	33 4	T 32 R F 4 (ELE) CFT40W	F44LL CFT40/2-BX	118 72	0.5	C-OCC	1,200 560	5 566 0.0 5 346 0.0	\$ 60.60 \$ 36.98	+	,	3.3 5.5	2.8
7	Women's TR	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	2000 1	20 1	2T 17 R F 2 (ELE)	F22ILL	33	0.0	C-OCC	2,000 66	5 54 0.0 5 54 0.0	\$ 7.96	\$ 303.75	\$ 35	38.2	33.8
7 257	Men's TR 135 Office	6	2T 32 R F 2 (u) (ELE) Thin Tube CFT40W	FU2LL CFT40/2-BX	72	0.1	SW	2000 1 2400 1,0	20 1 37 6	2T 17 R F 2 (ELE) CFT40W	F22ILL CFT40/2-BX	33 72	0.0	C-OCC	2,000 60 1,200 518	5 54 0.0 5 518 0.0	\$ 7.96 \$ 55.47	'	<u>'</u>	38.2	33.8
257	Child Study Room	11	CFT40W	CFT40/2-BX	72	0.8	SW	2400 1,9	0.	CFT40W	CFT40/2-BX	72	0.8	C-OCC	1,200 950	950 0.0	\$ 101.69	\$ 202.50	\$ 35	2.0	1.6
257 254	129 Child Study Team 125B Gvm Office	2	CFT40W T 32 R F 4 (ELE)	CFT40/2-BX F44LL	118	0.3	SW	2400 6 2400 5	91 4 66 2	CFT40W T 32 R F 4 (ELE)	CFT40/2-BX F44LL	72 118	0.3	C-OCC	1,200 340 1,200 283	346 0.0 3 283 0.0	\$ 36.98 \$ 30.30	\$ 202.50 \$ 202.50	<u> </u>	5.5 6.7	4.5
55	125B Gym Office	1	2T 17 R F 3 (ELÉ)	F23ILL	47	7 0.0	SW	2400 1	13 1	2T 17 R F 3 (ELE)	F23ILL	47	0.0	C-OCC	1,200 50	56 0.0	\$ 6.03	\$ 202.50	\$ 35	33.6	27.8
198 254	Women's TR 125A Office	2	2T 17 R F 2 (ELE) REFLECTOR T 32 R F 4 (ELE)	F22LL F44LL	118	0.0	SW	2000 2400 5	62 1 66 2	T 32 R F 4 (ELE)	F42SSILL F44LL	48 118	0.0	C-OCC	2,000 90 1,200 283	6 (34) (0.0) 3 283 0.0	\$ (5.01) \$ 30.30	+	<u> </u>	6.7	5.5
55	125A Office 125A Office	1	2T 17 R F 3 (ELE) 2T 17 R F 2 (ELE) REFLECTOR	F23ILL	47	0.0	SW	2400 1 2400	13 1	2T 17 R F 3 (ELÉ)	F23ILL	47	0.0	C-OCC	1,200 50	56 0.0	\$ 6.03	'	· ·	33.6	27.8
198 257	Weight Room	4	CFT40W	F22LL CFT40/2-BX	72	0.0	SW	1000 2	88 4	CFT40W	F42SSILL CFT40/2-BX	48 72	0.0	C-OCC	1,000 28	3 17 (0.0) 3 - 0.0	\$ 0.42 \$ -	\$ 308.75 \$ 202.50		730.5	612.2
257 257	Boy's Locker Room Boy's Locker Room TR	11	CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72	2 0.8	SW	2800 2,2 2800 8	18 11 06 4	CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72 72	0.8	C-OCC	2,000 1,584 2,000 570	4 634 0.0 6 230 0.0	\$ 67.80 \$ 24.65	Ψ000	<u>'</u>	3.0	2.5 6.8
257	Girl's Locker Room	8	CFT40W	CFT40/2-BX	72	0.6	SW	2800 1,6	13 8	CFT40W	CFT40/2-BX	72	0.6	C-OCC	2,000 1,15		\$ 49.31	\$ 202.50	\$ 35	4.1	3.4
257 257	Girl's Locker Room TR  Corridor	8	CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72	0.3	SW	2000 5 2280 1,3	76 4 13 8	CFT40W CFT40W	CFT40/2-BX CFT40/2-BX	72 72	0.3	C-OCC	2,000 570 2,280 1,313	6 - 0.0 3 - 0.0	\$ - \$ -	\$ 202.50 \$ 202.50	· ·		
257	Faculty Room	11	CFT40W	CFT40/2-BX	72	2 0.8	SW	2400 1,9	01 11	CFT40W	CFT40/2-BX	72	0.8	C-OCC	1,200 950	950 0.0	\$ 101.69	\$ 202.50	\$ 35	2.0	1.6
7	Men's TR Women's TR	1 1	2T 32 R F 2 (u) (ELE) Thin Tube 2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL FU2LL	60	0.1	SW	2000 1 2000 1	20 1 20 1	2T 17 R F 2 (ELE) 2T 17 R F 2 (ELE)	F22ILL F22ILL	33	0.0	C-OCC	2,000 60 2,000 60	54 0.0 54 0.0	\$ 7.96 \$ 7.96	+	<u> </u>	38.2 38.2	33.8 33.8
201	119 SGI	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2400 1,2 2400 1		0 2T 47 D E 2 (ELE)	F43SSILL	72	0.4	C-OCC	1,680 720	570 0.1	\$ 69.75	'	<u>'</u>	12.0	10.3
259	119 SGI Multipurpose Room	12	2T 32 R F 2 (u) (ELE) Thin Tube CFT40W	FU2LL CFT40/8-BX	288	3.5	C-OCC SW	3102.5 10,7	44     1       22     12	2T 17 R F 2 (ELE) CFT40W	F22ILL CFT40/8-BX	33 288	3.5	C-OCC	1,500 5,18	5 89 0.0 4 5,538 0.0	\$ 11.66 \$ 592.59	\$ 202.50	\$ 35	26.1 0.3	23.0 0.3
199 258	Multipurpose Room Corridor	34	W 32 C F 1 (ELE) CFQ13W	F41LL CFQ13/2-L	32	1.1	SW	3102.5 3,3 2280 7	76 34 02 11	0 CFQ13W	F41SSILL CFQ13/2-L	26 28	0.9	C-OCC	1,500 1,320 2,280 702	2,050 0.2	\$ 235.80	\$ 3,815.00 \$ 202.50		16.2	13.9
55	Corridor	11	2T 17 R F 3 (ELE)	F23ILL	47	7 0.5	SW	2280 1,1		2T 17 R F 3 (ELE)	F23ILL	47	0.5	C-OCC	2,280 1,179	5 0.0	\$ -	\$ 202.50	\$ 35		
201 13	114 Music 113 Music	12 42	T 32 R F 3 (ELE) S 32 P F 2 (ELE)	F43ILL/2 F42LL	90	1.1	SW	2400 2,5 2400 6,0	92 12 48 42	0	F43SSILL F42SSILL	72 48	0.9 2.0	C-OCC	1,680 1,452 1,680 3,38	,	\$ 139.50 \$ 325.50	' '	<u> </u>	10.6 14.3	9.1 12.9
7	113 Office	4	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	2400 5	76 4	2T 17 R F 2 (ELE)	F22ILL	33	0.1	C-OCC	1,680 222	2 354 0.1	\$ 46.64	\$ 607.50	\$ 35	13.0	12.3
254 201	113 Storage 127 Classroom	12	T 32 R F 4 (ELE) T 32 R F 3 (ELE)	F44LL F43ILL/2	118	0.4	SW C-OCC	2400 2,5	54 3 92 12	T 32 R F 4 (ELE)	F44LL F43SSILL	118 72	0.4	C-OCC	250 89 1,680 1,452	9 266 0.0 2 1,140 0.2	\$ 28.41 \$ 139.50	•	· ·	7.1 10.6	5.9 9.1
201	126 Classroom	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	2400 2,5	92 12	0 2T 47 D E 2 (EL E)	F43SSILL	72	0.9	C-OCC	1,680 1,452	2 1,140 0.2	\$ 139.50	\$ 1,477.50	\$ 215		9.1
258	Corridor Corridor	7	2T 17 R F 3 (ELE) CFQ13W	F23ILL CFQ13/2-L	28	0.5	SW	2280 4	72 10 47 7	2T 17 R F 3 (ELE) CFQ13W	F23ILL CFQ13/2-L	47 28	0.5	C-0CC	2,280 1,072 2,280 44	-   0.0 7   -   0.0	\$ - \$ -	\$ 202.50 \$ 202.50	<u> </u>		
13	157 Classroom 153 SGI	18	S 32 P F 2 (ELE) T 32 R F 3 (ELE)	F42LL F43ILL/2	60	1.1	C-OCC	2400 2,5 2400 1,9		0	F42SSILL F43SSILL	48	0.9	C-OCC	1,680 1,452	,	\$ 139.50	' '		15.2	13.6
201 201	154 SGI	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	2400 1,9		0	F43SSILL F43SSILL	72 72	0.6	C-OCC	1,680     1,089       1,680     1,089       1,680     1,089	9 855 0.2	\$ 104.63 \$ 104.63	\$ 1,158.75	\$ 170	11.1 11.1	9.5 9.5
13	Boy's TR Girl's TR	12	S 32 P F 2 (ELE) S 32 P F 2 (ELE)	F42LL F42LL	60	0.7	SW SW	2000 1,4 2000 1,4		0	F42SSILL F42SSILL	48 48	0.6	C-OCC	2,000 1,152 2,000 1,152		\$ 42.46 \$ 42.46			34.8 34.8	31.1
13	158 Classroom	18	S 32 P F 2 (ELE)	F42LL	60	1.1	C-OCC	2400 2,5	92 18	0	F42SSILL F42SSILL	48	0.9	C-OCC	<b>1,680</b> 1,45	2 1,140 0.2	\$ 139.50	\$ 2,115.00	\$ 215	15.2	13.6
	Total	864				68.9		159,035	864				60.6		100,518	8.3 and Savings	6,930 8.3	72,204 \$668	\$9,390	ļ	
																th Savings	58,518	\$6,261			
															Tot	al Savings		\$6,930		10.4	9.1

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# APPENDIX D New Jersey Pay For Performance Incentive Program New Jersey BPU - Energy Audits

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AND COOK GOVERNMENT HOME RESIDENTIAL RENEWABL

# COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

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PAY FOR PERFORMANCE

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DIRECT INSTALL

ARRA

**ENERGY BENCHMARKING** 

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# 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 eam 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, multifamily 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

# **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 Revo Pay for Performa

Incentives Now. Screw-in Lamps

Other updates pos







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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.

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# 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

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 saver

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.

# **New Jersey Pay For Performance Incentive Program**

**Note:** The following calculation is based on the New Jersey Pay For Performance Incentive Program per April, 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)	85,106
Is this audit funded by NJ BPU (Y/N)	Yes

Incentive	e #1	
Audit is funded by NJ BPU	\$0.10	\$/sqft

Board of Public Utilites (BPU)

	Annual Utilities		
	kWh	Therms	
Existing Cost (from utility)	\$157,856	\$15,958	
Existing Usage (from utility)	1,166,200 15,572		
Proposed Savings	92,161	1,852	
Existing Total MMBtus	5,537		
Proposed Savings MMBtus	500		
% Energy Reduction	9.0%		
Proposed Annual Savings	\$10,500		

	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	\$0.00	\$0.00
Incentive #3	\$0.09	\$0.90	\$0.005	\$0.05	\$0.11	\$1.25	\$0.00	\$0.00

	Incentives \$		
	Elec	Gas	Total
Incentive #1	\$0	\$0	\$8,511
Incentive #2	\$0	\$0	\$0
Incentive #3	\$0	\$0	\$0
Total All Incentives	\$0	\$0	\$8,511

Total Project Cost	\$525,126

		Allowable Incentive
% Incentives #1 of Utility Cost*	4.9%	\$8,511
% Incentives #2 of Project Cost**	0.0%	\$0
% Incentives #3 of Project Cost**	0.0%	\$0
Total Eligible Incentives***	\$8,511	
Project Cost w/ Incentives	\$516,615	

Project Payb	ack (years)
w/o Incentives	w/ Incentives
50.0	49.2

<sup>\*</sup> 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 #3 is 25% of total project cost.

Maximum allowable amount of Incentive #2 & #3 is \$1 million per gas account and \$1 million per electric account; maximum 2 million per project

 $<sup>^{\</sup>star\star}$  Maximum allowable amount of Incentive #2 is 25% of total project cost.

<sup>\*\*\*</sup> Maximum allowable amount of Incentive #1 is \$50,000 if not funded by NJ BPU, and \$25,000 if it is.

APPENDIX E
<b>Energy Savings Improvement Plan (ESIP)</b>
 New Jersey BPU - Energy Audits



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

HOME RESIDENTIAL COMMERCIAL, INDUSTRIAL RENEWABLE ENERGY





# COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

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  - PAY FOR PERFORMANCE
  - COMBINED HEAT & POWER AND FUEL CELLS
  - LOCAL GOVERNMENT ENERGY

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

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# **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





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## Franklin Lakes Public Schools - NJBPU Franklin Avenue Middle School

Cost of Electricity \$0.135 /kWh Electricity Usage 1,166,200 kWh/yr System Unit Cost /kW \$4,000

## Photovoltaic (PV) Solar Power Generation - Screening Assessment

	Budgetary	Annual Utility Savings			Estimated	Total	Federal Tax	New Jersey Renewable	Payback (without	Payback (with	
	Cost					Maintenance	Savings	Credit	** SREC	incentive)	incentive)
Γ						Savings					
Γ	\$	kW	kWh	therms	\$	\$	\$	\$	\$	Years	Years
	\$680,000	170.0	221,567	0	\$29,912	0	\$29,912	\$0	\$16,618	22.7	14.6
_					(0000) 0000 (	4-37	<b>^</b>	//			

<sup>\*\*</sup> Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= \$75 /1000kwh

Area Output\*

3,599 m2 38.734 ft2

Perimeter Output\*

1.335 ft

Available Roof Space for PV:

(Area Output - 10 ft x Perimeter) x 85%

21,574 ft2

Approximate System Size: Is the roof flat? (Yes/No) Yes

watt/ft2 172,592 DC watts

kW Enter into PV Watts 170

PV Watts Inputs\*\*\* Enter into PV Watts (always 20 if flat, if Array Tilt Angle pitched - enter estimated roof angle) Array Azimuth Enter into PV Watts (default)

Zip Code Enter into PV Watts DC/AC Derate Factor Enter info PV Watts 0.83

**PV Watts Output** 

221,567 annual kWh calculated in PV Watts program

% Offset Calc

Usage 1,166,200 (from utilities) PV Generation 221,567 (generated using PV Watts)

% offset 19%

http://www.freemaptools.com/area-calculator.htm

http://www.flettexchange.com\_

http://gisatnrel.nrel.gov/PVWatts\_Viewer/index.html





# AC Energy & Cost Savings



(Type comments here to appear on printout; maximum 1 row of 90 characters.)

Station Identification					
Cell ID:	0268370				
State:	New Jersey				
Latitude:	40.9 ° N				
Longitude:	74.2 ° W				
PV System Specifications					
DC Rating:	170.0 kW				
DC to AC Derate Factor:	0.830				
AC Rating:	141.1 kW				
Array Type:	Fixed Tilt				
Array Tilt:	20.0 °				
Array Azimuth:	180.0 °				
<b>Energy Specifications</b>	Energy Specifications				
Cost of Electricity:	13.5 ¢/kWh				

	Results					
Month Solar Radiation (kWh/m²/day)		AC Energy (kWh)	Energy Value (\$)			
1	2.65	11876	1603.26			
2	3.47	14065	1898.78			
3	4.83	20875	2818.12			
4	5.28	21397	2888.60			
5	5.93	24412	3295.62			
6	6.32	24512	3309.12			
7	5.87	23073	3114.86			
8	5.55	21965	2965.28			
9	5.04	19661	2654.24			
10	4.14	17289	2334.01			
11	2.82	11611	1567.49			
12	2.46	10831	1462.18			
Year	4.54	221567	29911.55			

Output Hourly Performance Data

(Gridded data is monthly, hourly output not available.)

Saving Text from a Browser

Output Results as Text

\_\_\_\_\_

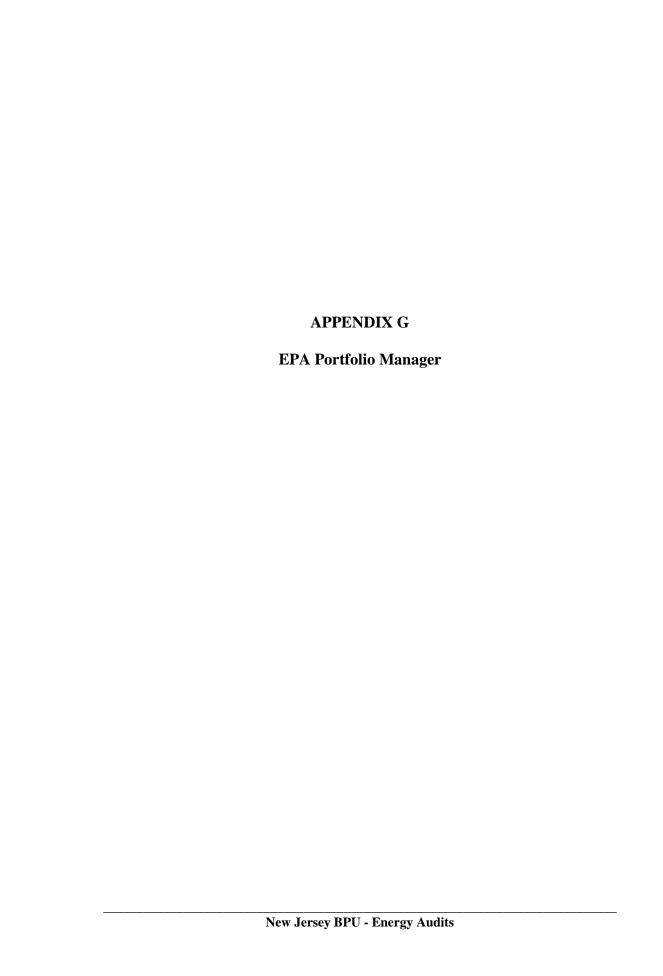
Run PVWATTS v.2 for another location

Run PVWATTS v.1

Please send questions and comments to Webmaster Disclaimer and copyright notice.



 $\mathsf{RReDC} \ \mathsf{home} \ \mathsf{page} \ (\mathit{http://rredc.nrel.gov})$ 





# STATEMENT OF ENERGY PERFORMANCE Franklin Avenue Middle School

**Building ID: 3257007** 

For 12-month Period Ending: May 31, 20121

N/A

**Facility Owner** 

Date SEP becomes ineligible: N/A

Date SEP Generated: August 17, 2012

**Primary Contact for this Facility** 

**Facility** 

Franklin Avenue Middle School 755 Franklin Ave.

Franklin Lakes, NJ 07417

Year Built: 1995

Gross Floor Area (ft2): 85,106

Energy Performance Rating<sup>2</sup> (1-100) 31

Site Energy Use Summary<sup>3</sup>

Electricity - Grid Purchase(kBtu) 3,979,074 1,557,237 Natural Gas (kBtu)4 Total Energy (kBtu) 5,536,311

Energy Intensity<sup>4</sup>

Site (kBtu/ft²/yr) 65 Source (kBtu/ft²/yr) 175

Emissions (based on site energy use) Greenhouse Gas Emissions (MtCO2e/year) 446

**Electric Distribution Utility** 

Rockland Electric Co [Consolidated Edison Inc]

**National Median Comparison** 

National Median Site EUI 55 National Median Source EUI 148 % Difference from National Median Source EUI 18% **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 Standards<sup>5</sup> 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

- 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.

The government estimates the average time needed to fill out this form is 6 hours (includes the time for entering energy data, Licensed Professional facility inspection, and notarizing the SEP) and welcomes suggestions for reducing this level of effort. Send comments (referencing OMB control number) to the Director, Collection Strategies Division, U.S., EPA (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460.

# 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.

VALUE AS ENTERED IN

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	$\overline{\mathbf{V}}$
Building Name	Franklin Avenue Middle 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	755 Franklin Ave., Franklin Lakes, NJ 07417	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	$   \sqrt{} $
Gross Floor Area	85,106 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 (Default)	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	149 (Default)	Is this the number of personal computers in the K12 School?		
Number of walk-in refrigeration/freezer units	1 (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 % (Default)	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	N/A(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: Rockland Electric Co [Consolidated Edison Inc]

Meter: Electricity (Heat) (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase				
Start Date	End Date	Energy Use (kWh (thousand Watt-hou		
05/01/2012	05/31/2012	44,800.00		
04/01/2012	04/30/2012	32,800.00		
03/01/2012	03/31/2012	43,200.00		
02/01/2012	02/29/2012	47,200.00		
01/01/2012	01/31/2012	52,400.00		
12/01/2011	12/31/2011	65,200.00		
11/01/2011	11/30/2011	37,200.00		
10/01/2011	10/31/2011	33,200.00		
09/01/2011	09/30/2011	42,000.00		
08/01/2011	08/31/2011	45,200.00		
07/01/2011	07/31/2011	54,800.00		
06/01/2011	06/30/2011	55,200.00		
ity (Heat) Consumption (kWh (thousand W	att-hours))	553,200.00		
ity (Heat) Consumption (kBtu (thousand B	u))	1,887,518.40		
	Electricity (kWh (thousand Wat Space(s): Entire Facility eneration Method: Grid Purcha			
Start Date	End Date	Energy Use (kWh (thousand Watt-hou		
05/01/2012	05/31/2012	59,200.00		
04/01/2012				
0-1/0 1/2012	04/30/2012	53,800.00		
03/01/2012	04/30/2012	53,800.00 52,600.00		
03/01/2012	03/31/2012	52,600.00		
03/01/2012 02/01/2012	03/31/2012	52,600.00 59,000.00		
03/01/2012 02/01/2012 01/01/2012	03/31/2012 02/29/2012 01/31/2012	52,600.00 59,000.00 53,800.00		
03/01/2012 02/01/2012 01/01/2012 12/01/2011	03/31/2012 02/29/2012 01/31/2012 12/31/2011	52,600.00 59,000.00 53,800.00 60,000.00		
03/01/2012 02/01/2012 01/01/2012 12/01/2011 11/01/2011	03/31/2012 02/29/2012 01/31/2012 12/31/2011 11/30/2011	52,600.00 59,000.00 53,800.00 60,000.00 55,000.00		
03/01/2012 02/01/2012 01/01/2012 12/01/2011 11/01/2011 10/01/2011	03/31/2012 02/29/2012 01/31/2012 12/31/2011 11/30/2011 10/31/2011	52,600.00 59,000.00 53,800.00 60,000.00 55,000.00 50,800.00		
03/01/2012 02/01/2012 01/01/2012 12/01/2011 11/01/2011 10/01/2011 09/01/2011	03/31/2012 02/29/2012 01/31/2012 12/31/2011 11/30/2011 10/31/2011 09/30/2011	52,600.00 59,000.00 53,800.00 60,000.00 55,000.00 50,800.00 52,400.00		
03/01/2012 02/01/2012 01/01/2012 12/01/2011 11/01/2011 10/01/2011 09/01/2011 08/01/2011	03/31/2012 02/29/2012 01/31/2012 12/31/2011 11/30/2011 10/31/2011 09/30/2011 08/31/2011	52,600.00 59,000.00 53,800.00 60,000.00 55,000.00 50,800.00 52,400.00 39,200.00		

Electricity Consumption (kBtu (thousand Btu)) 2,091,556.00						
Total Electricity (Grid Purchase) Consumption	(kBtu (thousand Btu))	3,979,074.40				
Is this the total Electricity (Grid Purchase) consElectricity meters?	sumption at this building including all					
Fuel Type: Natural Gas						
Meter: Natural Gas (therms) Space(s): Entire Facility						
Start Date	End Date	Energy Use (therms)				
05/01/2012	05/31/2012	316.76				
04/01/2012	04/30/2012	1,025.59				
03/01/2012	03/31/2012	1,636.01				
02/01/2012	02/29/2012	3,219.85				
01/01/2012	01/31/2012	3,095.11				
12/01/2011	12/31/2011	2,898.22				
11/01/2011	11/30/2011	2,071.54				
10/01/2011	10/31/2011	1,032.14				
09/01/2011	09/30/2011	59.01				
08/01/2011	08/31/2011	61.02				
07/01/2011	07/31/2011	48.52				
06/01/2011	06/30/2011	108.60				
Natural Gas Consumption (therms)		15,572.37				
Natural Gas Consumption (kBtu (thousand Btu	1))	1,557,237.00				
Total Natural Gas Consumption (kBtu (thousar	nd Btu))	1,557,237.00				
Is this the total Natural Gas consumption at thi	s building including all Natural Gas meters?					
Additional Fuels  Do the fuel consumption totals shown above repres	sent the total energy use of this building?					
Please confirm there are no additional fuels (district	t energy, generator fuel oil) used in this facility.					
On-Site Solar and Wind Energy  Do the fuel consumption totals shown above include	e all on-site solar and/or wind power located at					
your facility? Please confirm that no on-site solar or list. All on-site systems must be reported.						
Certifying Professional (When applying for the ENERGY STAR, the Certify	ring Professional must be the same PE or RA tha	at signed and stamped the SEP.)				
Name:	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
Franklin Avenue Middle School
755 Franklin Ave.
Franklin Lakes, NJ 07417

Facility Owner

Primary Contact for this Facility

### **General Information**

Franklin Avenue Middle School	
Gross Floor Area Excluding Parking: (ft²)	85,106
Year Built	1995
For 12-month Evaluation Period Ending Date:	May 31, 2012

**Facility Space Use Summary** 

School	
Space Type	K-12 School
Gross Floor Area (ft2)	85,106
Open Weekends? d	No
Number of PCs <sup>d</sup>	149
Number of walk-in refrigeration/freezer units <sup>d</sup>	1
Presence of cooking facilities d	Yes
Percent Cooled d	100
Percent Heated <sup>d</sup>	100
Months °	N/A
High School?	No
School District °	N/A

**Energy Performance Comparison** 

	Evaluatio	Comparisons			
Performance Metrics	Current (Ending Date 05/31/2012)	Baseline (Ending Date 05/31/2012)	Rating of 75	Target	National Median
Energy Performance Rating	31	31	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	65	65	43	N/A	55
Source (kBtu/ft²)	175	175	116	N/A	148
Energy Cost					
\$/year	\$ 168,558.34	\$ 168,558.34	\$ 111,577.59	N/A	\$ 142,698.04
\$/ft²/year	\$ 1.98	\$ 1.98	\$ 1.31	N/A	\$ 1.68
Greenhouse Gas Emissions					
MtCO₂e/year	446	446	295	N/A	378
kgCO <sub>2</sub> e/ft²/year	5	5	3	N/A	4

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

Franklin Avenue Middle School 755 Franklin Ave. Franklin Lakes, NJ 07417

Portfolio Manager Building ID: 3257007

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.



Least Efficient Median Most Efficient

This building uses 175 kBtu per square foot per year.\*

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



Date Generated: 08/17/2012

<sup>\*</sup>Based on source energy intensity for the 12 month period ending May 2012