

**ROXBURY TOWNSHIP BOARD OF EDUCATION
FRANKLIN ELEMENTARY SCHOOL
ENERGY ASSESSMENT**

for

**NEW JERSEY
BOARD OF PUBLIC UTILITIES**

CHA PROJECT NO. 24454

October 2012

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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-UPDATE

The Roxbury Township Board of Education 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:

Building Name	Address	Square Feet	Construction Date
Franklin Elementary School	8 Meeker Street Succasunna, NJ 07876	47,260	Original: 1956

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. Potential annual savings of \$18,200 for the recommended ECMs may be realized with a combined payback of 5.0 years. A summary of the costs, savings, and paybacks for the recommended ECMs follows:

Summary of Energy Conservation Measures							
Energy Conservation Measure		Approx. Costs (\$)	Approx. Savings (\$/year)	Payback (Years) w/o Incentive	Potential Incentive (\$)*	Payback (Years) w/ Incentive	Recommended For Implementation
ECM-1	EMS Expansion & Re-commissioning (Night Setback)	1,000	6,400	0.2	0	0.2	X
ECM-2	Demand Control Ventilation	4,000	2,300	1.7	0	1.7	X
ECM-3	Window Replacement	326,000	9,000	>20	0	>20	
ECM-4	Network Controller	2,000	1,400	1.4	0	1.4	X
ECM-5	Boiler Replacement	332,996	4,352	>20	0	>20	
ECM-6	Lighting Replacement / Upgrades	10,000	8,100	1.2	3,000	0.9	X
ECM-7	Install Lighting Controls (Occupancy Sensors)	23,000	6,200	3.7	4,000	3.1	
ECM-8	Lighting Replacements with Lighting Controls (Occupancy Sensors)	33,000	13,100	2.5	7,000	2.0	
ECM-9	Install Low Flow Fixtures	65,800	700	94.0	0	94.0	

2.0 INTRODUCTION AND BACKGROUND

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.

Franklin Elementary is an elementary school located in Succasunna, NY is a 47,260 square foot, one story block structure with exterior brick veneer. The building was constructed in 1956 with renovations of the gymnasium and roof in recent years. A new air handling unit was installed in the mechanical room above the gymnasium was installed in 2012. The classrooms are served by condensing units located on the roof, and two original boilers located in the mechanical room. Occupancy includes approximately 300 students and 43 faculty members. The school is occupied by maintenance personnel Monday through Friday from 6:00 am to 10:00 pm during the school year. Students are typically in the school between 8:00 am and 3:00 pm.

EXISTING CONDITIONS

2.1 Building - General

Built in the 1956 with several renovations, the Franklin Elementary School building is a 47,260 square foot, one-story school with high bay areas for the gym, and cafeteria. The school has approximately 300 students and 43 staff, and appeared fully utilized during the field survey. The building can be assumed to be fully occupied until 3:00 pm during the week. Custodial staff is typically in the building until 10:00 pm during the week. The hours of operation are:

- Monday through Friday 7:00 am to 10:00 pm (staff)
- Monday through Friday 8:00 am to 3:00 pm (students)
- Saturday & Sunday, open as needed

The original building is constructed of a steel frame and masonry with brick veneer. The interior walls are gypsum board. Several offices and computer labs have been renovated, and updated with newer lighting and cooling equipment to accommodate computer network equipment. All sections of the building have flat roofs, with elevated sections of the cafeteria and gymnasium. Both the gymnasium and cafeteria have ceilings that are approximately 30' tall. The school is served by two boilers in a boiler room located in the east side of the building. Both boilers are original. The domestic hot water tank and condensing units have been replaced in more recent years. All roof sections have a black membrane layer covered with a layer of stone ballast. The building windows are of single glazing with aluminum frames, and are typical for the building. The roof was replaced within the last ten years, and appeared to be in good condition. The school has exposed walls facing all directions.



2.2 Utility Usage

Utilities include electricity, natural gas, and potable water. Electricity is delivered by JCP&L and supplied by Direct Energy. Natural gas supplied by Hess and delivered by NJNG. Water is paid for through New Jersey American Water.

The building has one electric meter serving the site. From June 2011 through May 2012, the utility costs are listed below:

Actual Cost & Site Usage by Utility

Electric		
Annual Usage	438,000	kWh/yr
Annual Cost	99,525	\$
Blended Rate	0.227	\$/kWh
Supply Rate	0.214	\$/kWh
Demand Rate	4.18	\$/kW
Peak Demand	170.10	kW
Min. Demand	86.70	kW
Avg. Demand	117.58	kW
Natural Gas		
Annual Usage	24,775	therms/yr
Annual Cost	28,289	\$
Rate	1.14	\$/Therm

Electrical usage was generally higher in the winter months when heating equipment was operational. See Appendix A for a detailed utility analysis.

Under New Jersey's energy deregulation law, the supply portion of the electric (or natural gas) bill is separated from the delivery portion. With the supply portion open to competition, customers can shop around for the best price on their energy supplies. Their electric and natural gas distribution utilities will still deliver those supplies through their wires and pipes – and respond to emergencies, should they arise – regardless of where those supplies are purchased. Purchasing your energy supplies from a company other than your electric or gas utility is purely an economic decision; it has no impact on the reliability or safety of your service. Additional information on selecting a third party energy supplier is available here: <http://www.state.nj.us/bpu/commercial/shopping.html>. See Appendix A for a list of third-party energy suppliers licensed by the Board of Public Utilities to sell within the building's service area.

2.3 HVAC Systems

The systems and equipment described below serve the school building. Specifics on the mechanical equipment can be found within the equipment inventory located in Appendix B.

3.3.1 Heating Hot Water Systems

The building is heated with hot water supplied by two natural gas fired Fitzgibbons boilers with Power flame modulating burners. These boilers were installed in 1956 and are original to the building. The boilers are located in a mechanical room on the east side of the building. Each boiler is equipped with a high/low fire switch. The hot water system is manually turned on by a custodian at the beginning of the heating system from October to April, and shut down for the summer.

There are several pumps connected to the boiler plumbing lines. The two primary pumps are 1.5 HP lead/lag/standby pumps. There are 3 secondary 10 HP lead/lag pumps that serve as back up. These pumps are equipped with standard efficiency motors. Hot water is provided to fin tube radiators located in the hallway walls and unit ventilators in classrooms.

3.3.2 DX Cooling & Remote Condensing Units

Three 1-ton Fujitsu condensers are located on the roof and serve classrooms on the east side of the building. The Fujitsu units were installed in 1993, and appear to be in fair condition. Two 1-ton Friedrich condensers are located on the roof, with one on the east side of the building, and the other on the west side of the building. These units appear to be in fair condition. A 1-ton Mitsubishi Mr. Slim condenser is located on the roof above the media center on the west side of the building and appears to be in good condition.

Two McQuay air cooled condensing units were installed outside the kitchen door behind the building. These units serve the entire building and appear to be in good condition. Each unit contains four 1.5 HP fans.

3.3.3 Heating and Ventilating Rooftop and Air Handling Units

One McQuay air handler (AHU-2) was installed adjacent to the elevated gym roof. This unit is connected to the air handling unit (AHU-1) in the gym mechanical room. It is mounted on an elevated roof curb and serves cafeteria/auditorium. A Sterling makeup air unit (MAU-1) is located above the kitchen.

One Aeon natural gas fired heating and ventilating RTU (RTU-2) is located above the kitchen, and directly adjacent to MAU-1. A Lenox L-Series RTU (RTU-1) is located about the media center on the west side of the building. These units are used for both heating and cooling. Each unit is mounted on an extended roof curb. Supply and return ductwork is routed down through the roof curbs into the spaces served by each unit.

3.3.4 Unit Ventilators

Typically each classroom is served by a unit ventilator, which consists of heating/cooling coils, a circulation fan, outdoor air and return air dampers and temperature controls. During our audit we found that the unit ventilators are turned off due to comfort and/ or noise issues. When the units are “off”, the dampers are closed and no outdoor air is being introduced through the unit, therefore the heating load on the unit is much diminished. Replacing the existing unit ventilators with new units would require that the outside air quantity be provided to each classroom to meet the present code requirements which would result in an increase in energy use verses the current units. Although modern controls can help reduce the amount of energy used, ultimately the new unit ventilators will consume more energy than the present units.

3.3.5 Hydronic Heating Systems

Corridors and some spaces with exterior wall exposures are heated by perimeter hot water fin tube radiators with wall mounted thermostats. Other HVAC equipment (RTUs, UVs) provide cooling/ventilation and outside air for these spaces.

Corridors, entrance vestibules, and some rooms are heated by ceiling mounted hot water cabinet UVs controlled by space thermostats.

3.3.6 Exhaust Systems

Exhaust system fans are integrated into the school energy management systems (EMS) and generally operate during building occupancy.

Common exhaust plenums serve classrooms with rooftop mounted constant volume exhaust fans. Larger classrooms and spaces, including the gym and multipurpose room, have dedicated exhaust fans. Exhaust fans are used for restrooms and custodial closets throughout the building.

2.4 Control Systems

The building has several rooms controlled by the school district’s EMS system. The gym, all purpose room, media center and computer room have all been received renovations and are controlled by an Automated Logic system. The speech room, and rooms 12b, 14a, 14b, 22, 23 and 24 are also controlled by EMS. The controls for the EMS are operated from the facilities office in the high school. The building also has several pneumatic night thermostats that control different zones of the building.

2.5 Lighting/Electrical Systems

Since building construction, the school has re-ballasted and re-lamped some of their fixtures. A mixture of T12 and T8 bulbs and compact fluorescent spiral bulbs are utilized. Older style incandescent bulbs are also used in select areas, while metal halides are used in the gymnasium and cafeteria. The primary sources of control for the lights are switches manually turned off at the end of the school day.

2.6 Plumbing Systems

3.6.1 Domestic Hot Water System

The mechanical room contains two 100 gallon A.O. Smith Masterfit model BTR 200 A110 natural gas-fired hot water heater that serves the entire building. The majority of hot water piping appears to be insulated. Domestic hot water temperature is maintained at 140°F, and chemical disinfection soap is provided at the toilet rooms.

3.6.2 Plumbing Fixtures

The majority of the school’s original lavatories, water closets, and urinals are high flow fixtures. In general, lavatories are 2.5 gpm with push type faucets, water closets are 1.6 gpf, and urinals are 1.0 gpf. The toilet rooms have not been renovated since original construction.

3.0 ENERGY CONSERVATION MEASURES

3.1 ECM-1 Install Web Based Thermostat (Night Setback)

Franklin Elementary has classrooms utilized during the school day between the hours of 8:00 am and 3:00 pm. School offices are located near the main entrance of the building, and are occupied between the hours of 7:00 am and 5:00 pm. Expanding the district’s web based thermostat controls to include the entire building, would allow heating and cooling functions to operate when the building is occupied. These systems could be programmed to operate at lower temperatures when the building is unoccupied after hours, resulting in energy savings.

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

ECM-1 EMS Expansion & Re-commissioning (Night Setback)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$ 1,000	21,900	0	1,200	6,400	\$ 0	\$ 6,400	94.8	\$ 0	0.2	0.2

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

Expected Life: 15 years
 Lifetime Savings: 328,500 kWh 18,000 therms \$ 96,000

This measure is recommended.

3.2 ECM-2 Demand Control Ventilation (DCV)

Heating and ventilation AHUs serve the gymnasium (AHU-1) and the multipurpose room (AHU-2). It is assumed the original system controls provide the full design ventilation outside air flow. It is assumed the original system controls provide the full design ventilation outside air flow. Reducing outside air during occupied periods will reduce heating and cooling energy. The quantity of ventilation will be based on maintaining an acceptable carbon dioxide (CO₂) level in the space as an indicator of indoor air quality. A limit of 1000 PPM of CO₂ is recommended in ASHRAE Standard 62-1982, Ventilation for Acceptable

Indoor Air Quality. Sensors will be installed to measure the building air CO₂ concentration, and the control sequence of operation programmed into the BAS. During unoccupied periods, the outside air dampers should be closed.

Equipment supply and outside airflows were obtained from existing design drawings where possible, or from vendors per serial/model numbers found in the field. For the analysis, estimated savings for demand control ventilation are based on reducing the total average volume of outside air by 50% based on observed space usage. The energy savings are the differences in utility usage.

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

ECM-2 Demand Control Ventilation

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$ 4,000	3,600	0	1,300	2,300	\$ 0	\$ 2,300	9.3	\$ 0	1.7	1.7

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

Expected Life: 18 years
 Lifetime Savings: 64,800 kWh 23,400 therms \$ 41,400

This measure is recommended.

3.3 ECM-3 Window Replacement

The school has approximately 3,200 square feet of exposed window space in the original construction. All windows are constructed with aluminum frames with single pane glazing. Due to age, construction type and condition, these windows can only provide average thermal resistance to heat transfer. Energy loss due to excess air infiltration occurs between the building and its surroundings. An assessment considered the installation of triple pane windows with aluminum frames.

The calculation considered the amount of time the building was occupied, in the form of lighting bin hours, and a U-factor for the existing windows. Existing annual utility usage can be used as a baseline measure to develop the proposed utility usage. The difference between the proposed utility usage and the baseline utility usage represents the annual amount of heating and cooling savings.

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

ECM-3 Window Replacement

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$ 326,000	27,200	0	2,500	9,000	\$ 0	\$ 9,000	(0.3)	\$ 0	>20	>20

Expected Life: 25 years

Lifetime Savings: 680,000 kWh 62,500 therms \$ 225,000

This measure is recommended due to the windows are original and in poor condition.

3.4 ECM-4 Install Network Controller

Approximately 90 personal computers are utilized in classrooms, offices, and other areas throughout the building. These computers are left on for the entire day; it was noted during the site visit that the computers had hibernate modes turned off. When computers are not being used, significant energy savings can be realized when the total energy draw is reduced. An evaluation was performed for installing a computer network controller to reduce electrical energy draw from the computer network system when computers are not in use.

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

ECM-4 Network Controller

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$ 2,000	6,300	0	0	1,400	\$ 0	\$ 1,400	11.6	\$ 0	1.4	1.4

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

Expected Life: 15 years
 Lifetime Savings: 94,500 kWh 0 therms \$ 21,000

This measure is recommended.

3.5 ECM-5 Boiler Replacement

The building is currently heated with two 4700 mbh Power flame boilers from original construction. These boilers appear to be in poor condition.

Due to the condition, age and low efficiency of the existing boilers and piping system, the building was assessed for the installation of new high efficiency condensing boilers to provide hot water for heating during the winter months. A setup with three 3000 mbh natural gas fired boilers was estimated for the school, as this was the largest size available for condensing boiler. A third boiler was added to meet the full demand of the building. Older style cast iron boiler models existed at the previous capacity.

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

ECM-5 Boiler Replacement

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
332,996	0	0	4,352	5,000	0	5,000	(0.6)	0	>20	>20

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

Expected Life: 30 years
 Lifetime Savings: 148,826 kWh 130,500 therms \$ 150,000

This measure is not currently recommended due to the long payback time. However, this measure should be considered for future renovations.

3.6 ECM-6 Lighting Replacement

Many of the school’s classrooms and occupied spaces have replaced existing lighting with T-8 blubs in recent years. U-tube T-8s and 2 foot T-8s are used in some fixtures. Most can lights and surface mounted standard bulb fixtures use compact fluorescent lights (CFLs) instead of original incandescent bulbs. Metal halide fixtures still exist in the gymnasium and multipurpose room.

Modern fluorescent lamps convert electrical power into useful light more efficiently than an incandescent lamp or T-12 bulbs. A comprehensive fixture survey was conducted of the entire building. Each switch and circuit was identified, and the number of fixtures, locations, and existing wattage established (Appendix C). There is an opportunity to reduce consumption by upgrading the existing metal halide fixtures to T-8 or super T-8 fixtures. Supporting calculations, including assumptions for lighting hours and annual energy usage for each fixture, are provided in Appendix C.

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

ECM-6 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$	kWh	kW	Therms	\$	\$	\$		\$	Years	Years
10,000	34,300	0	0	8,100	0	8,100	11.5	3,000	1.2	0.9

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

Expected Life: 15 years
 Lifetime Savings: 514,500 kWh 0 therms \$ 121,500

This measure is recommended.

3.7 ECM-7 Install Occupancy Sensors

The current elementary school lighting is controlled by manual switches. Lights are generally turned on in the morning and shut off at night. During occupied times, there are rooms that are not occupied; however, the lights remain on. Adding occupancy controls to the individual rooms will automatically

control the lights based on occupancy. The occupancy sensor can be wall mounted near the switch or placed at the ceiling for larger room coverage. All occupancy sensors are equipped with a manual override feature. These sensors are generally not recommended in public toilet rooms.

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

ECM-7 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
23,000	27,400	0	0	6,200	0	6,200	3.0	4,000	3.7	3.1

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

Expected Life: 15 years
 Lifetime Savings: 411,000 kWh 0 therms \$ 93,000

This measure is not recommended in lieu of ECM-6.

3.8 ECM-8 Lighting Replacements with 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 ECM-7 and ECM-8 to reflect actual expected energy and demand reduction.

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

ECM-8 Lighting Replacements with Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
33,000	57,800	0	0	13,100	0	13,100	5.0	7,000	2.5	2.0

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

Expected Life: 15 years
 Lifetime Savings: 867,000 kWh 0 therms \$ 196,500

This measure is not recommended in lieu of ECM

3.9 ECM-9 Install Low Flow Fixtures

The existing toilet room fixtures consume more water than modern plumbing fixtures. It was determined that the current toilets and urinals with an average water use of 1.6 gal/flush for toilets and 1.6 gal/flush for urinals and 2.2 gallons per minute for faucets. Based on the number of occupants, it was estimated that each toilet and faucet is utilized approximately three 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 and 0.5 gal/flush urinals and 0.5 gallon per minute faucets.

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

ECM-9 Install Low Flow Fixtures

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
66,000	0	0	0	700	0	700	(0.8)	0	>20	>20

Expected Life: 15 years

Lifetime Savings: 0 kWh 0 therms \$ 10,500

This measure is not recommended.

4.0 PROJECT INCENTIVES

4.1 Incentives Overview

4.1.1 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/SF
- Minimum 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 initial 75% 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

The table below shows the summary of incentives available through the Pay for Performance program for this building. The total ECM savings did not meet the minimum 15% annual savings required to obtain incentives # 2 and #3, hence they are zero. Detailed calculations can be found in Appendix D.

	Incentives \$		
	Elec	Gas	Total
Incentive #1	\$0	\$0	\$5,000
Incentive #2	\$0	\$0	\$0
Incentive #3	\$0	\$0	\$0
Total All Incentives	\$0	\$0	\$5,000

The current ECM's does not meet the minimum savings of 15% and therefore the building will not be eligible for incentives #2 and #3. See Appendix D for additional details.

4.1.2 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.

4.1.3 Direct Install Program

The Direct Install Program targets small and medium sized facilities where the peak electrical demand does not exceed 150 kW in any of the previous 12 months. Buildings must be located in New Jersey and served by one of the state's public, regulated electric or natural gas utility companies.

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

The program pays 70% of each project cost up to \$75,000 per electrical utility account; total funding for each year is capped at \$250,000 per customer. Installations must be completed by a Direct Install participating contractor, a list of which can be found on the New Jersey Clean Energy Website at <http://www.njcleanenergy.com>. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this document.

Due to the peak demand observed from the utility bills of 170 kW in June of 2011, this building is not eligible for the direct install program.

4.1.4 Energy Savings Improvement Plans (ESIP)

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

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

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

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

5.0 ALTERNATIVE ENERGY SCREENING EVALUATION

5.1 Solar

5.1.1 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. All rooftop areas have been replaced, and are in good condition. It is recommended to install a permanent PV array at this time.

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. The PVWATT solar power generation model is provided in Appendix F.

Federal tax credits are also available for renewable energy projects up to 30% of installation cost. Since the school is a non-profit organization, federal taxes are paid and this project is eligible for this incentive.

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 \$65/ 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 20 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. 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 – 20 kW System

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
	\$	kW	kWh	therms						
\$80,000	20.0	24,979	0	\$5,670	0	\$5,670	\$0	\$1,624	14.1	11.0

* No federal tax credit currently available.

** Solar Renewable Energy Certificate Program (SREC) for 2012 is \$65/1000kwh

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.

5.1.2 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

6.0 EPA PORTFOLIO MANAGER

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

The Site EUI is the amount of heat and electricity consumed by a building as reflected in utility bills. Site energy may be delivered to a 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). Site EUI is a measure of a building's annual energy utilization per square foot. Site EUI is a good measure of a building's energy use and is utilized regularly for comparison of energy performance for similar building types.

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

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

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

The EPA Score, Site EUI, and Source EUI for Franklin Elementary School are as follows:

Energy Intensity	Franklin Elementary School	National Average
EPA Score	38	50
Site (kBtu/sf/year)	84	63
Source (kBtu/sf/year)	160.5	115

To be eligible to receive a national Energy Star score, a building must meet all three of these requirements:

1. Building designation – More than 50 percent of the building's gross floor area must be one of the spaces eligible to receive an Energy Star score. The remainder of the building must abide by specific rules for each space type.
2. Operating characteristics – To ensure the building is consistent with the peer group used for comparison, each space in your building must meet certain minimum and maximum thresholds for key operating characteristics.
3. Energy data – At least 12 full consecutive calendar months for all active meters, accounting for all energy use (regardless of fuel type) in the building.

In addition, a Licensed Professional (meaning a Professional Engineer or Registered Architect) must verify that all energy use is accounted for accurately, that the building characteristics have been properly reported (including the square footage of the building), that the building is fully functional in accordance with industry standards, and that each of the indoor environment criteria has been met.

The Franklin Elementary School is considered a higher than average energy consumer by the EPA Portfolio Manager which gives it a lower than average EPA score. For the School to qualify for the Energy Star label the EPA score is required to be above 75. There are several energy conservation measures recommended in this report, that if implemented will further reduce the energy use intensity and increase the EPA score of the Elementary School. This building does not appear to be eligible for Energy Star certification at this time.

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

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

The user name (“*roxburyboe*”) and password (“*energystar*”) for the building’s EPA Portfolio Manager Account has been provided to the Roxbury Township Board of Education.

7.0 CONCLUSIONS & RECOMMENDATIONS

The energy audit conducted by CHA at the Franklin Elementary School identified potential ECMs for lighting replacement, network controller installation, DCV and low flow fixtures. Potential annual savings of \$18,400 may be realized for the recommended ECMs, with a summary of the costs, savings, and paybacks as follows:

ECM-1 EMS Expansion & Re-commissioning (Night Setback)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
1,000	21,900	0	1,200	6,400	0	6,400	94.8	0	0.2	0.2

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

ECM-2 Demand Control Ventilation

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
4,000	3,600	0	1,300	2,300	0	2,300	9.3	0	1.7	1.7

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

ECM-4 Network Controller

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
2,000	6,300	0	0	1,400	0	1,400	11.6	0	1.4	1.4

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

ECM-6 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
10,000	34,300	0	0	8,100	0	8,100	11.5	3,000	1.2	0.9

Expected Life: 15 years
 Lifetime Savings: 514,500 kWh 0 therms \$ 121,500

Utility Usage Analysis

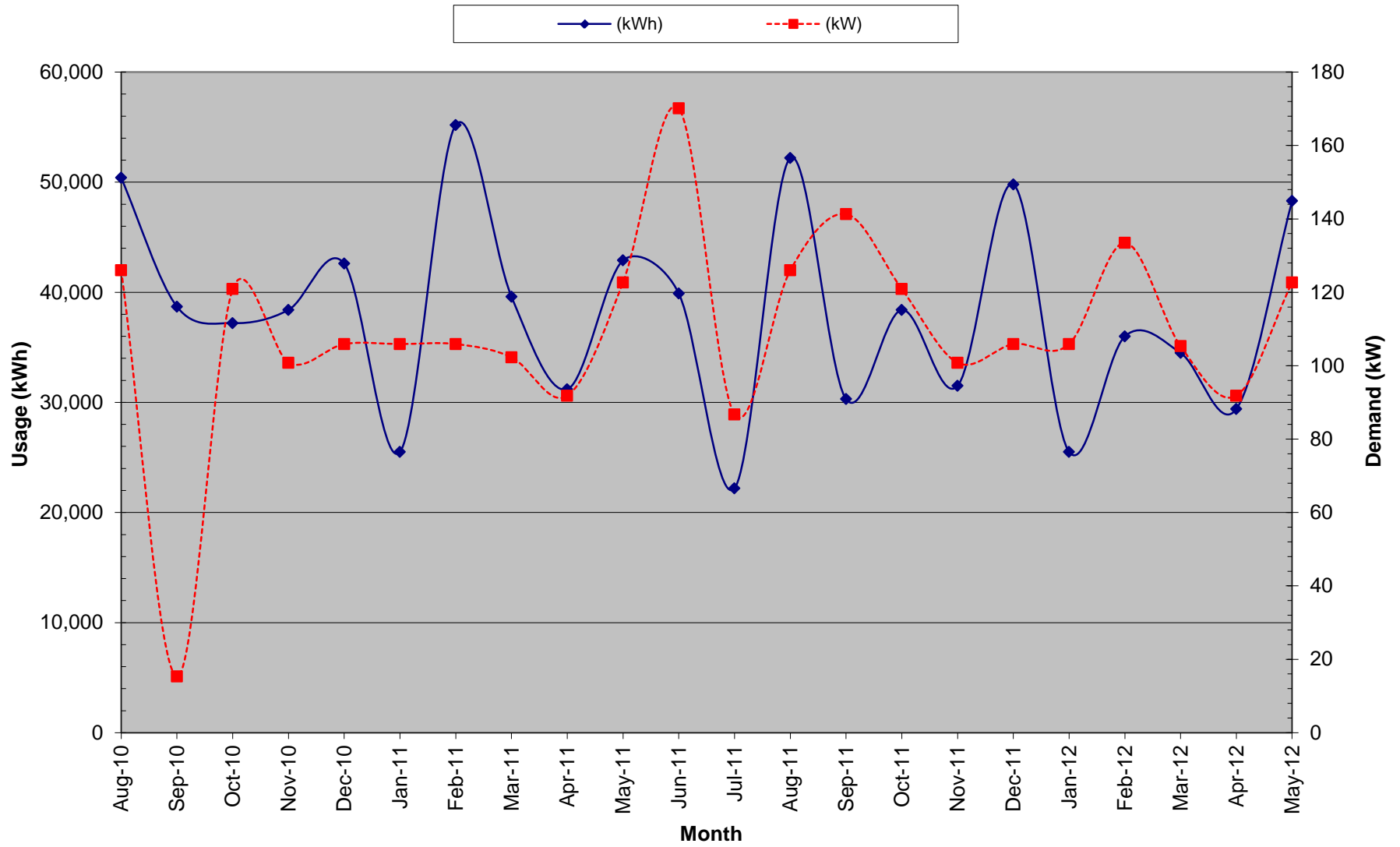
Roxbury Township BOE
 42 Hillside Ave.
 Succasunna, NJ 07876

Electric Service
 Delivery - JCP&L
 Supplier -

For Service at: Franklin Elementary School
 Account No.: 100000-8344-48
 Meter No.: 86352806

Month	Consumption (kWh)	Demand (kW)	Charges			Unit Costs		
			Total (\$)	Delivery (\$)	Supply (\$)	Blended Rate (\$/kWh)	Consumption (\$/kWh)	Demand (\$/kW)
August-10	50,400	126.00	\$ 12,386.45			\$ 0.246	\$ 0.246	\$ -
September-10	38,700	15.30	\$ 9,811.92			\$ 0.254	\$ 0.254	\$ -
October-10	37,200	120.90	\$ 9,279.07			\$ 0.249	\$ 0.230	\$ 5.93
November-10	38,400	100.80	\$ 9,427.33			\$ 0.246	\$ 0.246	\$ -
December-10	42,600	105.90	\$ 10,420.94			\$ 0.245	\$ 0.245	\$ -
January-11	25,500	105.90	\$ 6,512.65			\$ 0.255	\$ 0.255	\$ -
February-11	55,200	105.90	\$ 13,300.71			\$ 0.241	\$ 0.241	\$ -
March-11	39,600	102.30	\$ 9,418.72			\$ 0.238	\$ 0.238	\$ -
April-11	31,200	91.80	\$ 7,456.66			\$ 0.239	\$ 0.239	\$ -
May-11	42,900	122.70	\$ 9,737.96			\$ 0.227	\$ 0.227	\$ -
June-11	39,900	170.10	\$ 9,445.45			\$ 0.237	\$ 0.237	\$ -
July-11	22,200	86.70	\$ 5,199.28			\$ 0.234	\$ 0.210	\$ 6.14
August-11	52,200	126.00	\$ 11,685.19			\$ 0.224	\$ 0.208	\$ 6.39
September-11	30,300	141.30	\$ 7,189.41			\$ 0.237	\$ 0.237	\$ -
October-11	38,400	120.90	\$ 8,735.11			\$ 0.227	\$ 0.227	\$ -
November-11	31,500	100.80	\$ 7,189.71			\$ 0.228	\$ 0.210	\$ 5.83
December-11	49,800	105.90	\$ 11,025.55			\$ 0.221	\$ 0.209	\$ 5.86
January-12	25,500	105.90	\$ 5,963.39			\$ 0.234	\$ 0.210	\$ 5.86
February-12	36,000	133.50	\$ 8,312.21			\$ 0.231	\$ 0.209	\$ 5.99
March-12	34,500	105.30	\$ 7,663.98	\$ 4,485.49	\$ 3,178.49	\$ 0.222	\$ 0.130	\$ 5.86
April-12	29,400	91.80	\$ 6,522.75	\$ 3,814.13	\$ 2,708.62	\$ 0.222	\$ 0.130	\$ 5.77
May-12	48,300	122.70	\$ 10,592.37	\$ 6,142.49	\$ 4,449.88	\$ 0.219	\$ 0.127	\$ 6.37
Total (12-months)	438,000	170.10	\$99,524.40	\$14,442.11	\$10,336.99	\$ 0.227	\$ 0.214	\$ 4.18

Electric Usage - Franklin Elementary School



Roxbury Township BOE
 42 Hillside Ave.
 Succasunna, NJ 07876

Gas Service
 Delivery - NJNG
 Supplier -

For Service at: Franklin Elementary School
 Account No.: 02-1106-3125-25
 Meter No.: 00543748

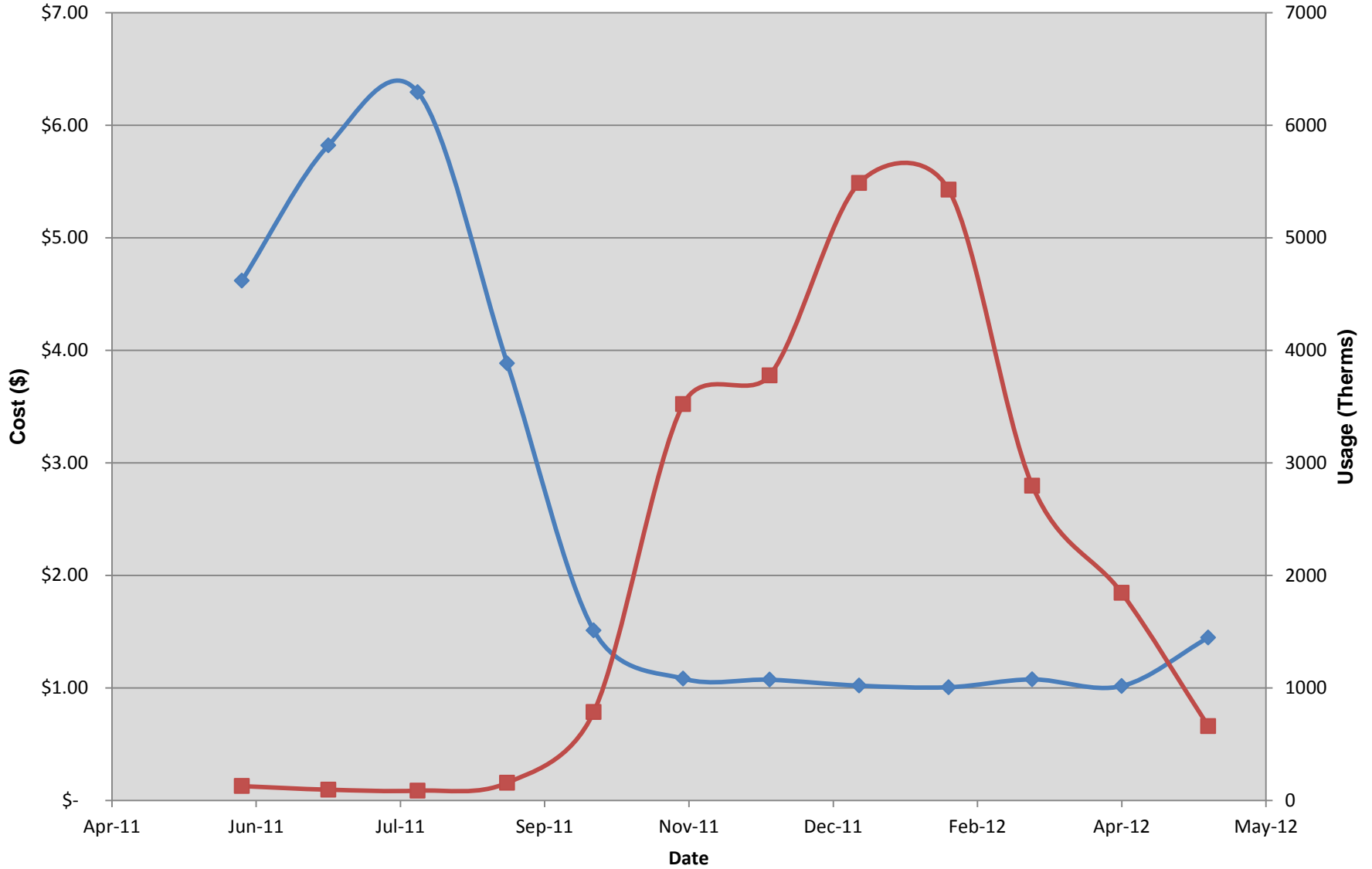
Month	Total (\$)	Delivery (\$)	Supply (\$)	Total Therms	\$/Therm
Sep-10	\$ 579.78			124.8	\$ 4.65
Oct-10	\$ 1,646.61			1219.5	\$ 1.35
Nov-10	\$ 3,760.13			3378.1	\$ 1.11
Dec-10	\$ 6,886.93			6453.1	\$ 1.07
Jan-11	\$ 8,126.79			7718	\$ 1.05
Feb-11	\$ 6,728.45			6313.4	\$ 1.07
Mar-11	\$ 2,288.25			1740.9	\$ 1.31
Apr-11	\$ 2,658.66			2208.9	\$ 1.20
May-11	\$ 677.70			217.5	\$ 3.12
Jun-11	\$ 590.67			127.9	\$ 4.62
Jul-11	\$ 560.67			96.3	\$ 5.82
Aug-11	\$ 552.71			87.8	\$ 6.30
Sep-11	\$ 613.25			157.8	\$ 3.89
Oct-11	\$ 1,188.79			786.8	\$ 1.51
Nov-11	\$ 3,816.22			3521.7	\$ 1.08
Dec-11	\$ 4,055.89			3778.3	\$ 1.07
Jan-12	\$ 5,601.14			5487.4	\$ 1.02
Feb-12	\$ 5,463.97			5428	\$ 1.01
Mar-12	\$ 3,012.07			2798	\$ 1.08
Apr-12	\$ 1,876.82			1844.5	\$ 1.02
May-12	\$ 956.96			661	\$ 1.45
Total (12-months)	\$ 28,289.16	\$ -	\$ -	24775.50	\$ 1.14

APPENDIX B

Equipment Inventory

Natural Gas Usage - Franklin Elementary School (12 Months)

◆ \$/Therm ■ Total Therms



New Jersey BPU Energy Audit Program

CHA #24454

Roxbury BOE

Franklin Elementary School

Original Construction Date:

1956

Renovation/Addition Date:

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.
RTU-6	1	Mitsubishi	MS09TW	2002954	Condenser	1 Ton	Roof	School	1995	3	
RTU-2	1	Aaon	54024	200405-AMGH08646	AHU NG / DX	(1) 3/4 HP CD. (1) 2 HP EV.	Roof	School	1995	15	
RTU-1	1	Lenox	LGA120H2BH2Y	5604B00650	AHU NG / DX	5 HP @87.5 Eff. 10 Tons Cooling	Roof	School	2002	5	
RTU-3	3	Fujitsu	AOU18C1	T001524	Split DX AC Unit	1 Ton	Roof	School	1993	1	
RTU-4	1	Friedrich	MRC12CF		Condenser	1 Ton	Roof	School	1995	3	
RTU-5	1	McQuay	OAH017FDAC	EB0U040200336	AHU NG / DX	(4) 1.5 HP CD Fans	Roof	School	2002	5	Works With ACCU-1
ACCU-1	1	McQuay	ACZ045BC12-ER11	STNU040200208	ACCU NG / DX	(4) 1.5 HP CD Fans	Outside	School	2004	7	
ACCU-2	1	McQuay	ACZ055BC12-ER11	STNU040200197	ACCU NG / DX	(4) 1.5 HP CF Fans	Outside	School	2004	12	
MAU-1	1	Sterling	EIJ-PV25C6C03L43M2AA1 B2A5EIJIN6	S04449395001001	Makeup Air Unit	1.5 HP 250,000/197,500 btu/hr IN/OUT	Roof	School	2004	7	
B-1	1	Fitzgibbons	C3-G0-25	108843583	Boiler		MER	School	1956	-31	
B-2	1	Fitzgibbons	C3-G0-25	108843584	Boiler		MER	School	1956	-31	
SP	2				Secondary Pump	10 HP Lead/Lag	MER	School	1956	-46	
PP	3				Primary Pump	1.5 HP Lead/Lag/Standby	MER	School	1956	-46	
DHW	2	AO Smith	BTR200A110	LA03-217460-110	DHW / NG	199 MBH / 100 Gal.	MER	School	1993	6	
AHU-1	1	McQuay	CAH021FDAC	FB0U040200339	AHU NG / DX	10 HP Sup. / 7.5 HP Ret.	Gym MER	School	2012	15	Works With ACCU-2
AHU-2	1	McQuay	CAH017FDAC	FB0U040200336	AHU NG / DX	10 HP Sup. / 7.5 HP Ret.	Roof	School	2002	5	
Refrigerator	2	Traulsen			Refrigerator		Kitchen	Kitchen	2002	5	
Oven	2	Blodgett	CM-B-MA	U04-169.32	Oven / NG	192 CFM max/150 CFM min	Kitchen	Kitchen	2002	5	
Range	1	Vulcan			Range / NG		Kitchen	Kitchen	2002	5	
Freezer	1				Walk-In Freezer		Kitchen	Kitchen	2002	5	
Dishwasher	1	Jackson Church	Series 150		Dishwasher		Kitchen	Kitchen	2002	5	

APPENDIX C

ECM Calculations

Summary of Energy Conservation Measures							
Energy Conservation Measure		Approx. Costs (\$)	Approx. Savings (\$/year)	Payback (Years) w/o Incentive	Potential Incentive (\$)*	Payback (Years) w/ Incentive	Recommended For Implementation
ECM-1	EMS Expansion & Re-commissioning (Night Setback)	1,000	6,400	0.2	0	0.2	X
ECM-2	Demand Control Ventilation	4,000	2,300	1.7	0	1.7	X
ECM-3	Window Replacement	326,000	9,000	>20	0	>20	
ECM-4	Network Controller	2,000	1,400	1.4	0	1.4	X
ECM-5	Boiler Replacement	332,996	4,352	>20	0	>20	
ECM-6	Lighting Replacement / Upgrades	10,000	8,100	1.2	3,000	0.9	X
ECM-7	Install Lighting Controls (Occupancy Sensors)	23,000	6,200	3.7	4,000	3.1	
ECM-8	Lighting Replacements with Lighting Controls (Occupancy Sensors)	33,000	13,100	2.5	7,000	2.0	

Site Name - Franklin Elementary School
CHA Project #24454
Franklin Elementary School

ECM Summary Sheet

ECM-1 EMS Expansion & Re-commissioning (Night Setback)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
1,000	21,900	0	1,200	6,400	0	6,400	94.8	0	0.2	0.2

Expected Life: 15 years
 Lifetime Savings: 328,500 kWh 18,000 therms \$ 96,000

ECM-2 Demand Control Ventilation

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
4,000	3,600	0	1,300	2,300	0	2,300	9.3	0	1.7	1.7

Expected Life: 18 years
 Lifetime Savings: 64,800 kWh 23,400 therms \$ 41,400

ECM-3 Window Replacement

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
326,000	27,200	0	2,500	9,000	0	9,000	(0.3)	0	>20	>20

Expected Life: 25 years
 Lifetime Savings: 680,000 kWh 62,500 therms \$ 225,000

ECM-4 Network Controller

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
2,000	6,300	0	0	1,400	0	1,400	11.6	0	1.4	1.4

Expected Life: 15 years
 Lifetime Savings: 94,500 kWh 0 therms \$ 21,000

ECM-5 Boiler Replacement

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
332,996	0	0	4,352	5,000	0	5,000	(0.6)	0	>20	>20

Expected Life: 30 years
 Lifetime Savings: 148,826 kWh 130,500 therms \$ 150,000

ECM-6 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
10,000	34,300	0	0	8,100	0	8,100	11.5	3,000	1.2	0.9

Expected Life: 15 years
 Lifetime Savings: 514,500 kWh 0 therms \$ 121,500

ECM-7 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
23,000	27,400	0	0	6,200	0	6,200	3.0	4,000	3.7	3.1

Expected Life: 15 years
 Lifetime Savings: 411,000 kWh 0 therms \$ 93,000

ECM-8 Lighting Replacements with Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
33,000	57,800	0	0	13,100	0	13,100	5.0	7,000	2.5	2.0

Expected Life: 15 years
 Lifetime Savings: 867,000 kWh 0 therms \$ 196,500

Site Name - Franklin Elementary School
 CHA Project #24454

Utility Costs	Yearly Usage	MTCDE	Building Area	Annual Utility Cost	
\$ 0.227 \$/kWh blended		0.00042021	47260	Electric	Natural Gas
\$ 0.214 \$/kWh supply	438,000	0.00042021		69663.00	35060.00
\$ 4.18 \$/kW	170.1	0			
\$ 1.14 \$/Therm	24,776	0.00533471			
\$ - \$/kgals	-	0			

Franklin Elementary School

Item	Savings						Cost	Simple Payback	MTCDE	Life Expectancy	NJ Smart Start Incentives	Direct Install Eligible (Y/N)*	Direct Install Incentives**	Max Incentives	Payback w/ Incentives***	Simple Projected Lifetime Savings						ROI
	kW	kWh	therms	cooling kWh	kgal/yr	\$										kW	kWh	therms	cooling	kgal/yr	\$	
ECM-1 EMS Expansion & Re-commissioning (Night Setback)	0.0	21,900	1,239	0	0	\$ 6,400	\$ 1,000	0.2	15.8	15		N	\$ -	\$ -	0.2	0.0	328,500	18,582	0	0	\$ 95,753	94.8
ECM-2 Demand Control Ventilation	0.0	3,626	1,280	0	0	\$ 2,300	\$ 4,000	1.7	8.4	18		N	\$ -	\$ -	1.7	0.0	65,272	23,037	0	0	\$ 41,079	9.3
ECM-3 Window Replacement	0.0	27,176	2,476	0	0	\$ 9,000	\$ 326,100	36.2	24.6	25		N	\$ -	\$ -	36.2	0.0	679,394	61,908	0	0	\$224,798	(0.3)
ECM-4 Network Controller	0.0	6,300	0	0	0	\$ 1,400	\$ 1,700	1.2	2.6	15.0		N	\$ -	\$ -	1.2	0.0	94,500	0	0	0	\$ 21,452	11.6
ECM-5 Boiler Replacement	0.0	0	4,352	0	0	\$ 5,000	\$ 332,996	66.6	23.2	30.0	\$ 15,750	N	\$ -	\$ 15,750	63.4	0.0	0	130,549	0	0	\$148,826	(0.6)
ECM-6 Lighting Replacement / Upgrades	15.0	34,270	0	0	0	\$ 8,100	\$ 9,729	1.2	14.4	15.0	\$ 3,028	N	\$ -	\$ 3,028	0.8	225.6	514,045	0	0	0	\$121,320	11.5
ECM-7 Install Lighting Controls (Occupancy Sensors)	0.0	27,368	0	0	0	\$ 6,200	\$ 23,085	3.7	11.5	15.0	\$ 3,990	N	\$ -	\$ 3,990	3.1	0.0	410,514	0	0	0	\$ 93,187	3.0
ECM-8 Lighting Replacements with Lighting Controls (Occupancy Sensors)	15.0	57,807	0	0	0	\$ 13,100	\$ 32,814	2.5	24.3	15.0	\$ 7,018	N	\$ -	\$ 7,018	2.0	225.6	867,111	0	0	0	\$196,876	5.0
Total (Does Not Include ECM-6 & ECM-7)	15.0	116,809	4,995	0	0	\$ 32,200	\$ 365,614	11.4		17.6	\$ 7,018		\$ -	\$ 7,018	11.1	225.6	2,034,777	103,527	0	0	\$564,778	0.5
Total Measures with Payback <10	15.0	89,634	2,519	0	0	\$ 23,200	\$ 39,514	1.7		15.5	\$ 7,018		\$ -	\$ 7,018	1.4	225.6	1,355,383	41,619	0	0	\$348,812	7.8
% of Existing	9%	27%	20%	0%	0%																	#DIV/0!

Site Name - Franklin Elementary School
CHA Project #24454
Franklin Elementary School

Add VSD's to the HV unit fans

EXISTING CONDITIONS		
Existing Facility Total Electric usage	438,000	kWh
Existing Facility Natural Gas Usage	24,776	Therms
Cost of Electricity	\$ 0.21	\$/kWh
	\$ 1.14	\$/Therm
SAVINGS		
TOD Electric savings	21,900	kWh ²
TOD Natural Gas savings	1,239	Gallons ³
Total Cost Savings	\$ 6,099	
Estimated Total Project Cost	\$ 1,000	⁴
Simple Payback	0.2	years

Assumptions

- 1 5% Approximate electric savings due to night setback
- 2 5% Approximate natural gas savings due to night setback
- 3 Project cost is an estimate, includes cost of replacing non- programmable thermostats with programmable thermostats
- 4 control work cost

Multipliers	
Material:	1.00
Labor:	1.25
Equipment:	1.00

ECM-M8A: Install Demand Control Ventilation - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
CO2 sensor	1	ea	\$ 400	\$ 100	\$ -	\$ 399	\$ 125	\$ -	\$ 500	
Replace damper actuators	1	ea	\$ 100	\$ 50	\$ -	\$ 100	\$ 62	\$ -	\$ 200	
Control system programming	1	ls	\$ 500	\$ 1,000	\$ -	\$ 499	\$ 1,246	\$ -	\$ 1,700	
electrical/wiring	1	ls	\$ 1,000	\$ 2,000	\$ -	\$ 997	\$ 2,492	\$ -	\$ 3,500	

\$ 5,900	Subtotal
\$ 1,180	20% Contingency
\$ 885	15% Contractor O&P
\$ 885	15% Engineering
\$ 8,850	Total

Site Name - Franklin Elementary School
CHA Project #24454
Franklin Elementary School

Window Replacement

Window Area	3,261 SF	Prop Occupied Htg Temp.	72 °F
Internal Balance Temp.	60 °F	Prop Unoccupied Htg Temp.	65 °F
Heating System Efficiency	80%	Prop Occupied Clng Temp.	74 °F
Cooling EER	1.2 (Btu/Watt)	Prop Unoccupied Clng Temp.	78 °F
Existing U factor	0.87 Btu/(h*sqft*degf)	\$/ kWh	\$0.21
Proposed U factor	0.45 Btu/(h*sqft*degf)	\$/ Therm	\$1.14

Avg Outdoor Air Temp. Bins °F	Proposed Occupied Hours	Unoccupied Bin Hours	Existing Occupied Energy Mbtu	Existing Unoccupied Energy Mbtu	Proposed Occupied Energy Mbtu	Proposed Unoccupied Energy Mbtu	Heating Energy Savings (Therms)	Cooling Energy Savings (kWh)	Total Cost Savings
102.5	0	0	0	0	0	0	0	-	\$0
97.5	3	1	200	59	103	31	0	104	\$22
92.5	34	12	1,785	500	923	258	0	919	\$197
87.5	131	47	5,017	1,261	2,595	652	0	2,526	\$541
82.5	500	179	12,058	2,280	6,237	1,179	0	5,768	\$1,234
77.5	620	221	6,156	0	3,184	0	0	2,477	\$530
72.5	664	237	0	0	0	0	0	-	\$0
67.5	854	305	10,903	0	5,639	0	0	4,386	\$939
62.5	927	331	24,985	2,348	12,923	1,215	0	10,996	\$2,353
57.5	600	214	24,683	4,560	12,767	2,358	126	-	\$144
52.5	610	218	33,747	7,726	17,455	3,996	179	-	\$204
47.5	611	218	42,470	10,834	21,967	5,604	230	-	\$262
42.5	656	234	54,903	14,955	28,398	7,736	301	-	\$343
37.5	1023	365	100,130	28,505	51,791	14,744	554	-	\$632
32.5	734	262	82,255	24,171	42,546	12,502	459	-	\$523
27.5	334	119	42,167	12,691	21,811	6,564	236	-	\$270
22.5	252	90	35,390	10,852	18,305	5,613	199	-	\$227
17.5	125	45	19,328	6,016	9,997	3,112	109	-	\$125
12.5	47	17	7,934	2,500	4,104	1,293	45	-	\$51
7.5	22	8	4,026	1,282	2,082	663	23	-	\$26
2.5	13	5	2,563	823	1,326	426	15	-	\$17
-2.5	0	0	0	0	0	0	0	-	\$0
-7.5	0	0	0	0	0	0	0	-	\$0
TOTALS	8,760	3,129	510,698	131,362	264,154	67,946	2,476	27,176	\$8,639

Window Breakdown

Location	# of	Total Sqft.	
S	93	948	
W	30	660	
N	82	1110	
E	48	543	
			3261
Replacement Cost		\$ 100 / Sqft	
Total Cost		\$326,100	

ECM-3: Network Controller Savings Calculations

Notes:

1. Savings are for the installation of a centralized computer management system installed on the client server that will centralize the power management functions that are native to the Windows environment.
2. Energy savings per computer are based on historical information from previous installations encompassing tens of thousands of computers.
3. There are approximately 90 computers in all

Background Data	
Average Consumption and Savings Figures	
	kWh
Average Total Consumption per PC per Year	500-700
Average Energy and Cost Waste per PC per Year	350-450
Average savings per PC	70
Average savings per IMac	50

Number of PCs	90
Number of IMac's	0

Return on Investment Analysis	
	kWh
Annual Energy Savings	6,300
Annual Cost Savings	\$1,430

HEATING PENALTY		Comments
Total kWh	6,300	This is the total kWh reduction.
Htg. Season	60%	The percentage of the kWh reduction that occurs when heat is required.
Conducted/Convected Heat	30%	Use Standard Fluorescent fixture
Regained	80%	Percentage regained. If in return air plenum application the percentage would be close to 100%.
Net kWh	227	Resultant kWh from percentage reductions.
Net btu	774,068.40	Conversion of kWh to btu's.
Therms	8	Conversion of btu's to Therms
Htg. Eff.	88%	Heating system efficiency.
Net Penalty	8.8	Therms
\$/Therm	\$ 1.14	Cost per Therm
Penalty	\$ 10	Final heating reduction penalty.

ALL ESTIMATES ARE +/- 80% ACCURATE -DO NOT USE FOR PROCUREMENT

ECM-M3A: Boiler Replacement

Existing Fuel

Nat.Gas ▼

Proposed Fuel

Nat.Gas ▼

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	\$ 1.14	/ Therm	
Proposed Fuel Cost	\$ 1.14	/ Therm	
Baseline Fuel Use	23,550	Therms	Based on historical utility data
Existing Boiler Plant Efficiency	75%		Estimated or Measured
Baseline Boiler Load	1,766,250	Mbtu/yr	Baseline Fuel Use x Existing Efficiency x 100 Mbtu/Therms
Baseline Fuel Cost	\$ 26,847		
Proposed Boiler Plant Efficiency	92%		New Boiler Efficiency
Proposed Fuel Use	19,198	Therms	Baseline Boiler Load / Proposed Efficiency / 100 Mbtu/Therms
Proposed Fuel Cost	\$ 21,886		

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

BOILER REPLACEMENT SAVINGS SUMMARY					
	Electric Demand	Electric Usage	Nat Gas Usage	Maint.	Total Cost
	(kW)	(kWh)	(Therms)	(\$)	(\$)
Savings	0	0	4,352	\$0	\$4,961

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

ECM-M3A: Boiler Replacement - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
3,000 MBH NG Condensing Boiler	3	EA	\$ 45,000	\$ 20,000		\$ 148,500	\$ 81,000	\$ -	\$ 229,500	
Flue Installation	1	LS	\$ 10,000.0	\$ 5,000.00		\$ 11,000	\$ 6,750	\$ -	\$ 17,750	
Reprogram DDC system	1	EA	\$ 100.0	\$ 350.00		\$ 110	\$ 473	\$ -	\$ 583	
Miscellaneous Electrical	1	LS	\$ 500	\$ 250		\$ 550	\$ 338	\$ -	\$ 888	
Miscellaneous HW Piping	1	LS	\$ 2,000	\$ 1,000		\$ 2,200	\$ 1,350	\$ -	\$ 3,550	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	

\$ 252,270	Subtotal
\$ 25,227.00	10% Contingency
\$ 55,499.40	20% Contractor O&P
\$ -	
\$ 332,996	Total

Energy Audit of Franklin Elementary School
CHA Project No.24454

ECM-1 Lighting Replacements

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$9,729	15.0	34,270	0	\$8,088	0	\$8,088	\$3,028	1.2	0.8

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-2 Install Occupancy Sensors

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$23,085	0.0	27,368	0	\$5,857	0	\$5,857	\$3,990	3.9	3.3

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-3 Lighting Replacements with Occupancy Sensors

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$32,814	15.0	57,807	0	\$13,125	0	\$13,125	\$7,018	2.5	2.0

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

Energy Audit of Franklin Elementary School
 CHA Project No.24454
 Existing Lighting

Cost of Electricity: **\$0.214** \$/kWh
\$4.18 \$/kW

EXISTING CONDITIONS											
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Retrofit Control	Annual kWh
20	Main Office	Offices	8	S 32 C F 1 (ELE)	F41LL	32	0.26	SW	2400	C-OCC	614
108	Main Office Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
20	Principal's Office	Offices	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2400	C-OCC	307
20	Work Room	Offices	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2400	C-OCC	307
20	Nurse	Offices	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Nurse	Offices	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288
108	Nurse Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
146	Gym	Gynasium	9	High Bay MH 400	MH400/1	458	4.12	SW	2000	C-OCC	8,244
146	Gym	Gynasium	9	High Bay MH 400	MH400/1	458	4.12	SW	2000	C-OCC	8,244
15	Gym Office 1	Offices	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288
213	Gym Office 2	Offices	4	T 32 R F 3 (ELE) (TWO SWITCH)	F43ILL/2	90	0.36	SW	2400	C-OCC	864
15	Gym Office 2 Storage	Storage Areas	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	1000	SW	60
15	Gym Office 3	Offices	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288
15	Gym Vestibule	Gynasium	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	2000	C-OCC	240
146	All Purpose Room	Classrooms	12	High Bay MH 400	MH400/1	458	5.50	SW	2400	C-OCC	13,190
8	All Purpose Room	Classrooms	6	MH 175	MH175/1	215	1.29	SW	2400	C-OCC	3,096
254	Kitchen	Cafeteria	13	T 32 R F 4 (ELE)	F44LL	118	1.53	SW	1600	C-OCC	2,454
15	Kitchen	Cafeteria	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	1600	C-OCC	96
254	Kitchen Office	Offices	1	T 32 R F 4 (ELE)	F44LL	118	0.12	SW	2400	C-OCC	283
5	Kitchen Bathroom	Bath Room	1	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.06	SW	2000	SW	120
15	Kitcehn Area Mechanical	Storage Areas	3	S 32 C F 2 (ELE)	F42LL	60	0.18	SW	1000	SW	180
15	Kitcehn Area Mechanical	Storage Areas	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	1000	SW	60
129	Boiler Room	Storage Areas	4	SP 75 I	I75/1	75	0.30	SW	1000	SW	300
108	Boiler Room Faculty Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
108	Boiler Room Faculty Bathroom Entryway	Storage Areas	1	I 65	I65/1	65	0.07	SW	1000	SW	65
20	Faculty Room	Offices	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2400	C-OCC	307
108	Faculty Room	Offices	1	I 65	I65/1	65	0.07	SW	2400	C-OCC	156
108	Faculty Room Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
108	Faculty Room Closet	Storage Areas	1	I 65	I65/1	65	0.07	SW	1000	SW	65
15	Staff Room	Offices	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
20	Custodian Room	Offices	2	S 32 C F 1 (ELE)	F41LL	32	0.06	SW	2400	C-OCC	154
15	Central Boy's Bathroom	Bath Room	5	S 32 C F 2 (ELE)	F42LL	60	0.30	SW	2000	SW	600
15	Central Girl's Bathroom	Bath Room	5	S 32 C F 2 (ELE)	F42LL	60	0.30	SW	2000	SW	600
108	Central Closet	Storage Areas	1	I 65	I65/1	65	0.07	SW	1000	SW	65
15	Room 1	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
20	Room 1	Classrooms	9	S 32 C F 1 (ELE)	F41LL	32	0.29	SW	2400	C-OCC	691
20	Room 1	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 1	Classrooms	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2400	C-OCC	307
20	Room 1	Classrooms	2	S 32 C F 1 (ELE)	F41LL	32	0.06	SW	2400	C-OCC	154
108	Room 1 Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
15	Room 2	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
20	Room 2	Classrooms	9	S 32 C F 1 (ELE)	F41LL	32	0.29	SW	2400	C-OCC	691
20	Room 2	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 2	Classrooms	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2400	C-OCC	307
20	Room 2	Classrooms	2	S 32 C F 1 (ELE)	F41LL	32	0.06	SW	2400	C-OCC	154
108	Room 2 Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
15	Room 3	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
20	Room 3	Classrooms	9	S 32 C F 1 (ELE)	F41LL	32	0.29	SW	2400	C-OCC	691
20	Room 3	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 3	Classrooms	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2400	C-OCC	307
20	Room 3	Classrooms	2	S 32 C F 1 (ELE)	F41LL	32	0.06	SW	2400	C-OCC	154
108	Room 3 Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
20	Room 4	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 4	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 4	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 4	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576

Energy Audit of Franklin Elementary School
 CHA Project No.24454
 Existing Lighting

Cost of Electricity: **\$0.214** \$/kWh
\$4.18 \$/kW

EXISTING CONDITIONS											
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Retrofit Control	Annual kWh
108	Room 4 Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
20	Room 5	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 5	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 5	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 5	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
108	Room 5 Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
20	Room 6	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 6	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 6	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 6	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
108	Room 6 Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
20	Room 7	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 7	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 7	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 7	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
108	Room 7 Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
20	Room 8	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 8	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 8	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 8	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
108	Room 8 Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
20	Room 9	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 9	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 9	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 9	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
108	Room 9 Bathroom	Bath Room	1	I 65	I65/1	65	0.07	SW	2000	SW	130
20	Room 10	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 10	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 10	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 10	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
20	Room 11	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 11	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 11	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 11	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
254	Room 12A	Classrooms	6	T 32 R F 4 (ELE)	F44LL	118	0.71	SW	2400	C-OCC	1,699
254	Room 12B	Classrooms	6	T 32 R F 4 (ELE)	F44LL	118	0.71	SW	2400	C-OCC	1,699
20	Room 13	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 13	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 13	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 13	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
254	Room 14A	Classrooms	6	T 32 R F 4 (ELE)	F44LL	118	0.71	SW	2400	C-OCC	1,699
254	Room 14B	Classrooms	6	T 32 R F 4 (ELE)	F44LL	118	0.71	SW	2400	C-OCC	1,699
20	Room 15	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 15	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 15	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 15	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
20	SP Room	Classrooms	6	S 32 C F 1 (ELE)	F41LL	32	0.19	SW	2400	C-OCC	461
20	SP Room	Classrooms	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2400	C-OCC	307
20	S. Central Mechanical	Storage Areas	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	1000	SW	128
108	S. Central Mechanical	Storage Areas	1	I 65	I65/1	65	0.07	SW	1000	SW	65
20	Room 16	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 16	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 16	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 16	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
20	Room 17	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 17	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384

Energy Audit of Franklin Elementary School
 CHA Project No.24454
 Existing Lighting

Cost of Electricity: **\$0.214** \$/kWh
\$4.18 \$/kW

EXISTING CONDITIONS											
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Retrofit Control	Annual kWh
20	Room 17	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 17	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
20	Room 18	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 18	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 18	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 18	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
20	Room 19	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 19	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 19	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 19	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
20	Room 20	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 20	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 20	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 20	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
20	Room 21	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 21	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
20	Room 21	Classrooms	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	C-OCC	384
15	Room 21	Classrooms	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	C-OCC	576
213	Room 22	Classrooms	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43ILL/2	90	1.08	SW	2400	C-OCC	2,592
213	Room 23	Classrooms	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43ILL/2	90	1.08	SW	2400	C-OCC	2,592
213	Room 24	Classrooms	14	T 32 R F 3 (ELE) (TWO SWITCH)	F43ILL/2	90	1.26	SW	2400	C-OCC	3,024
5	Room 24	Classrooms	1	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.06	SW	2400	C-OCC	144
15	Room 24 Storage 1	Storage Areas	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	1000	SW	120
15	Room 24 Storage 2	Storage Areas	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	1000	SW	120
15	Room 24 Storage 3	Storage Areas	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	1000	SW	120
15	W. Boy's Bathroom	Bath Room	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2000	SW	480
15	W. Girl's Bathroom	Bath Room	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2000	SW	480
15	W. Men's Bathroom	Bath Room	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2000	SW	120
15	W. Women's Bathroom	Bath Room	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2000	SW	120
15	W. Closet	Storage Areas	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	1000	SW	60
245	Media Center	Classrooms	37	T 32 R F 3 (ELE)	F43LE	110	4.07	SW	2400	C-OCC	9,768
37	Media Center	Classrooms	4	SP 26 R CF 3	CFQ26/3	99	0.40	SW	2400	C-OCC	950
5	Media Center	Classrooms	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	2400	C-OCC	288
15	Media Center Office	Offices	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288
15	Media Center Storage	Storage Areas	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	1000	SW	120
254	Computer Room	Classrooms	12	T 32 R F 4 (ELE)	F44LL	118	1.42	SW	2400	C-OCC	3,398
15	E./W. Hallway	Hallways	17	S 32 C F 2 (ELE)	F42LL	60	1.02	SW	2280	SW	2,326
15	E./W. Hallway	Hallways	8	S 32 C F 2 (ELE)	F42LL	60	0.48	SW	2280	SW	1,094
15	N./S. Hallway	Hallways	13	S 32 C F 2 (ELE)	F42LL	60	0.78	SW	2280	SW	1,778
15	N./S. Hallway	Hallways	3	S 32 C F 2 (ELE)	F42LL	60	0.18	SW	2280	SW	410
15	N./S. Hallway	Hallways	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2280	SW	547
15	SW. Exit Hallway	Hallways	3	S 32 C F 2 (ELE)	F42LL	60	0.18	SW	2280	SW	410
15	NW. Exit Hallway	Hallways	3	S 32 C F 2 (ELE)	F42LL	60	0.18	SW	2280	SW	410
15	S. Exit Hallway	Hallways	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	2280	SW	274
254	S. Exit Hallway	Hallways	1	T 32 R F 4 (ELE)	F44LL	118	0.12	SW	2280	SW	269
238	Exterior	Outdoor Lighting	4	WP 400 Po HPS	hps400/1	465	1.86	SW	4368	SW	8,124
68	Exterior	Outdoor Lighting	15	175 MH WALL	MH175/1	215	3.23	SW	4368	SW	14,087
79	Exterior	Outdoor Lighting	14	SP I 100	I100/1	100	1.40	SW	4368	SW	6,115
	Total		748				59				146,559

Energy Audit of Franklin Elementary School

CHA Project No.24454

ECM-1 Lighting Replacements

Cost of Electricity: \$0.214 \$/kWh
\$4.18 \$/kWh

Area Description	No. of Fixtures	EXISTING CONDITIONS							RETROFIT CONDITIONS							COST & SAVINGS ANALYSIS								
		Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback	
20 Main Office	8	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2400	614	8	S 32 C F 1 (ELE)	F41LL	32	0.256	SW	2400	614.4	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
108 Main Office Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130	1	CF 26	CFQ26/1-L	27	0.027	SW	2000	54	76.00	0.04	\$ 18.17	\$ 20.25	\$ -	-	1.1	0.3
20 Principal's Office	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.128	SW	2400	307.2	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Work Room	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.128	SW	2400	307.2	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Nurse	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
15 Nurse	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	2400	288	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
108 Nurse Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130	1	CF 26	CFQ26/1-L	27	0.027	SW	2000	54	76.00	0.04	\$ 18.17	\$ 20.25	\$ -	-	1.1	0.3
146 Gym	9	High Bay MH 400	MH400/1	458	4.1	SW	2000	8,244	9	P 54 C F 4	FC20	20	0.18	SW	2000	360	7884.00	3.94	\$ 1,884.91	\$ 2,700.00	\$ 900.00	-	1.4	0.2
146 Gym	9	High Bay MH 400	MH400/1	458	4.1	SW	2000	8,244	9	P 54 C F 4	FC20	20	0.18	SW	2000	360	7884.00	3.94	\$ 1,884.91	\$ 2,700.00	\$ 900.00	-	1.4	0.2
15 Gym Office 1	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	2400	288	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
213 Gym Office 2	4	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	0.4	SW	2400	864	4	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	0.36	SW	2400	864	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
15 Gym Office 2 Storage	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	60	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	1000	60	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
15 Gym Office 3	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	2400	288	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
15 Gym Vestibule	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2000	240	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	2000	240	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
146 All Purpose Room	12	High Bay MH 400	MH400/1	458	5.5	SW	2400	13,190	12	P 54 C F 4	FC20	20	0.24	SW	2400	576	12614.40	5.26	\$ 2,963.12	\$ 3,600.00	\$ 1,200.00	-	1.2	0.2
8 All Purpose Room	6	MH 175	MH175/1	215	1.3	SW	2400	3,096	6	MH 175	MH175/1	215	1.29	SW	2400	3,096	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
254 Kitchen	13	T 32 R F 4 (ELE)	F44LL	118	1.5	SW	1600	2,454	13	T 32 R F 4 (ELE)	F44LL	118	1.534	SW	1600	2,454.4	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
15 Kitchen	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1600	96	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	1600	96	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
254 Kitchen Office	1	T 32 R F 4 (ELE)	F44LL	118	0.1	SW	2400	283	1	T 32 R F 4 (ELE)	F44LL	118	0.118	SW	2400	283.2	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
5 Kitchen Bathroom	1	2T 32 R F 2 (u) (ELE)	FU2LL	120	0.1	SW	2000	120	1	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.06	SW	2000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
15 Kitchn Area Mechanical	3	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	1000	180	3	S 32 C F 2 (ELE)	F42LL	60	0.18	SW	1000	180	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
15 Kitchn Area Mechanical	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	60	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	1000	60	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
129 Boiler Room	4	SP 75 1	I75/1	75	0.3	SW	1000	300	4	CF 26	CFQ26/1-L	27	0.108	SW	1000	108	192.00	0.19	\$ 50.72	\$ 81.00	\$ 28.00	-	1.6	0.3
108 Boiler Room Faculty Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130	1	CF 26	CFQ26/1-L	27	0.027	SW	2000	54	76.00	0.04	\$ 18.17	\$ 20.25	\$ -	-	1.1	0.3
108 Entryway	1	I 65	I65/1	65	0.1	SW	1000	65	1	CF 26	CFQ26/1-L	27	0.027	SW	1000	27	38.00	0.04	\$ 10.04	\$ 20.25	\$ -	-	2.0	0.5
20 Faculty Room	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.128	SW	2400	307.2	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
108 Faculty Room	1	I 65	I65/1	65	0.1	SW	2400	156	1	CF 26	CFQ26/1-L	27	0.027	SW	2400	64.8	91.20	0.04	\$ 21.42	\$ 20.25	\$ -	-	0.9	0.2
108 Faculty Room Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130	1	CF 26	CFQ26/1-L	27	0.027	SW	2000	54	76.00	0.04	\$ 18.17	\$ 20.25	\$ -	-	1.1	0.3
108 Faculty Room Closet	1	I 65	I65/1	65	0.1	SW	1000	65	1	CF 26	CFQ26/1-L	27	0.027	SW	1000	27	38.00	0.04	\$ 10.04	\$ 20.25	\$ -	-	2.0	0.5
15 Staff Room	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Custodian Room	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	154	2	S 32 C F 1 (ELE)	F41LL	32	0.064	SW	2400	153.6	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
15 Central Boy's Bathroom	5	S 32 C F 2 (ELE)	F42LL	60	0.3	SW	2000	600	5	S 32 C F 2 (ELE)	F42LL	60	0.3	SW	2000	600	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
15 Central Girl's Bathroom	5	S 32 C F 2 (ELE)	F42LL	60	0.3	SW	2000	600	5	S 32 C F 2 (ELE)	F42LL	60	0.3	SW	2000	600	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
108 Central Closet	1	I 65	I65/1	65	0.1	SW	1000	65	1	CF 26	CFQ26/1-L	27	0.027	SW	1000	27	38.00	0.04	\$ 10.04	\$ 20.25	\$ -	-	2.0	0.5
15 Room 1	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 1	9	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2400	691	9	S 32 C F 1 (ELE)	F41LL	32	0.288	SW	2400	691.2	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 1	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 1	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.128	SW	2400	307.2	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 1	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	154	2	S 32 C F 1 (ELE)	F41LL	32	0.064	SW	2400	153.6	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
108 Room 1 Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130	1	CF 26	CFQ26/1-L	27	0.027	SW	2000	54	76.00	0.04	\$ 18.17	\$ 20.25	\$ -	-	1.1	0.3
15 Room 2	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 2	9	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2400	691	9	S 32 C F 1 (ELE)	F41LL	32	0.288	SW	2400	691.2	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 2	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.128	SW	2400	307.2	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 2	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	154	2	S 32 C F 1 (ELE)	F41LL	32	0.064	SW	2400	153.6	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
108 Room 2 Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130	1	CF 26	CFQ26/1-L	27	0.027	SW	2000	54	76.00	0.04	\$ 18.17	\$ 20.25	\$ -	-	1.1	0.3
15 Room 3	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 3	9	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2400	691	9	S 32 C F 1 (ELE)	F41LL	32	0.288	SW	2400	691.2	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 3	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 3	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.128	SW	2400	307.2	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
20 Room 3	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	154	2	S 32 C F 1 (ELE)	F41LL	32	0.064	SW	2400	153.6	0.00	0.00	\$ -	\$ -	\$ -	-	-	-
108																								

Area Description	No. of Fixtures	EXISTING CONDITIONS							RETROFIT CONDITIONS							COST & SAVINGS ANALYSIS							
		Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
20 Room 13	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 13	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 13	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-
254 Room 14A	6	T 32 R F 4 (ELE)	F44LL	118	0.7	SW	2400	1,699	6	T 32 R F 4 (ELE)	F44LL	118	0.708	SW	2400	1699.2	0.00	0.00	\$ -	\$ -	\$ -	-	-
254 Room 14B	6	T 32 R F 4 (ELE)	F44LL	118	0.7	SW	2400	1,699	6	T 32 R F 4 (ELE)	F44LL	118	0.708	SW	2400	1699.2	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 15	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 15	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 15	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 15	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 SP Room	6	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	461	6	S 32 C F 1 (ELE)	F41LL	32	0.192	SW	2400	460.8	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 SP Room	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307	4	S 32 C F 1 (ELE)	F41LL	32	0.128	SW	2400	307.2	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 S. Central Mechanical	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	1000	128	4	S 32 C F 1 (ELE)	F41LL	32	0.128	SW	1000	128	0.00	0.00	\$ -	\$ -	\$ -	-	-
108 S. Central Mechanical	1	I65	I65/1	65	0.1	SW	1000	65	1	CF 26	CFQ26/1-L	27	0.027	SW	1000	27	38.00	0.04	\$ 10.04	\$ 20.25	\$ -	2.0	0.5
20 Room 16	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 16	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 16	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 16	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 17	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 17	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 17	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 17	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 18	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 18	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 18	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 18	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 19	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 19	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 19	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 19	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 20	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 20	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 20	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 20	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 21	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 21	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 21	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2400	384	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 21	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2400	576	0.00	0.00	\$ -	\$ -	\$ -	-	-
213 Room 22	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.1	SW	2400	2,592	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.08	SW	2400	2592	0.00	0.00	\$ -	\$ -	\$ -	-	-
213 Room 23	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.1	SW	2400	2,592	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.08	SW	2400	2592	0.00	0.00	\$ -	\$ -	\$ -	-	-
213 Room 24	14	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.3	SW	2400	3,024	14	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.26	SW	2400	3024	0.00	0.00	\$ -	\$ -	\$ -	-	-
5 Room 24	1	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2400	144	1	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.06	SW	2400	144	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 24 Storage 1	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	1000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 24 Storage 2	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	1000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 24 Storage 3	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	1000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Boy's Bathroom	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2000	480	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2000	480	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Girl's Bathroom	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2000	480	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2000	480	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Men's Bathroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2000	120	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Women's Bathroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2000	120	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Closet	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	60	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	1000	60	0.00	0.00	\$ -	\$ -	\$ -	-	-
245 Media Center	37	T 32 R F 3 (ELE)	F43LE	110	4.1	SW	2400	9,768	37	T 32 R F 3 (ELE)	F43LE	110	4.07	SW	2400	9768	0.00	0.00	\$ -	\$ -	\$ -	-	-
37 Media Center	4	SP 26 R CF 3	CFQ26/3	99	0.4	SW	2400	950	4	SP 26 R CF 3	CFQ26/3	99	0.396	SW	2400	950.4	0.00	0.00	\$ -	\$ -	\$ -	-	-
5 Media Center	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2400	288	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	2400	288	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Media Center Office	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	2400	288	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Media Center Storage	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	1000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
254 Computer Room	12	T 32 R F 4 (ELE)	F44LL	118	1.4	SW	2400	3,398	12	T 32 R F 4 (ELE)	F44LL	118	1.416	SW	2400	3398.4	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 E./W. Hallway	17	S 32 C F 2 (ELE)	F42LL	60	1.0	SW	2280	2,326	17	S 32 C F 2 (ELE)	F42LL	60	1.02	SW	2280	2325.6	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 E./W. Hallway	8	S 32 C F 2 (ELE)	F42LL	60	0.5	SW	2280	1,094	8	S 32 C F 2 (ELE)	F42LL	60	0.48	SW	2280	1094.4	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 N./S. Hallway	13	S 32 C F 2 (ELE)	F42LL	60	0.8	SW	2280	1,778	13	S 32 C F 2 (ELE)	F42LL	60	0.78	SW	2280	1778.4	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 N./S. Hallway	3	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2280	410	3	S 32 C F 2 (ELE)	F42LL	60	0.18	SW	2280	410.4	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 N./S. Hallway	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2280	547	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2280	547.2	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 SW. Exit Hallway	3	S 32 C F 2 (ELE)	F42LL	60	0.2																		

Area Description	No. of Fixtures	EXISTING CONDITIONS							RETROFIT CONDITIONS							COST & SAVINGS ANALYSIS							
		Standard Fixture Code	Fixture Code	Watts per Fixture	kWh/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kWh/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
20 Main Office	8	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2400	614.4	8	S 32 C F 1 (ELE)	F41LL	32	0.3	C-OCC	1200	307.2	307.20	0.00	\$ 65.74	\$ 202.50	\$ 35.00	3.1	2.5
108 Main Office Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130.0	1	I 65	I65/1	65	0.1	SW	2000	130	0.00	\$ -	\$ -	\$ -	-	-	-
20 Principal's Office	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1200	153.6	153.60	0.00	\$ 32.87	\$ 202.50	\$ 35.00	6.2	5.1
20 Work Room	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1200	153.6	153.60	0.00	\$ 32.87	\$ 202.50	\$ 35.00	6.2	5.1
20 Nurse	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1200	192	192.00	0.00	\$ 41.09	\$ 202.50	\$ 35.00	4.9	4.1
15 Nurse	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 C F 2 (ELE)	F42LL	60	0.1	C-OCC	1200	144	144.00	0.00	\$ 30.82	\$ 202.50	\$ 35.00	6.6	5.4
108 Nurse Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130.0	1	I 65	I65/1	65	0.1	SW	2000	130	0.00	\$ -	\$ -	\$ -	-	-	-
146 Gym	9	High Bay MH 400	MH400/1	458	4.1	SW	2000	8,244.0	9	High Bay MH 400	MH400/1	458	4.1	C-OCC	2000	8244	0.00	\$ -	\$ -	\$ 202.50	\$ 35.00	-	-
146 Gym	9	High Bay MH 400	MH400/1	458	4.1	SW	2000	8,244.0	9	High Bay MH 400	MH400/1	458	4.1	C-OCC	2000	8244	0.00	\$ -	\$ -	\$ 202.50	\$ 35.00	-	-
15 Gym Office 1	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 C F 2 (ELE)	F42LL	60	0.1	C-OCC	1200	144	144.00	0.00	\$ 30.82	\$ 202.50	\$ 35.00	6.6	5.4
213 Gym Office 2	4	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	0.4	SW	2400	864.0	4	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	0.4	C-OCC	1200	432	432.00	0.00	\$ 92.45	\$ 202.50	\$ 35.00	2.2	1.8
15 Gym Office 2 Storage	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	60.0	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	60	0.00	\$ -	\$ -	\$ -	-	-	-
15 Gym Office 3	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 C F 2 (ELE)	F42LL	60	0.1	C-OCC	1200	144	144.00	0.00	\$ 30.82	\$ 202.50	\$ 35.00	6.6	5.4
15 Gym Vestibule	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2000	240.0	2	S 32 C F 2 (ELE)	F42LL	60	0.1	C-OCC	2000	240	0.00	\$ -	\$ -	\$ 202.50	\$ 35.00	-	-
146 All Purpose Room	12	High Bay MH 400	MH400/1	458	5.5	SW	2400	13,190.4	12	High Bay MH 400	MH400/1	458	5.5	C-OCC	1680	9233.28	3957.12	0.00	\$ 846.82	\$ 202.50	\$ 35.00	0.2	0.2
8 All Purpose Room	6	MH 175	MH175/1	215	1.3	SW	2400	3,096.0	6	MH 175	MH175/1	215	1.3	C-OCC	1680	2167.2	928.80	0.00	\$ 198.76	\$ 202.50	\$ 35.00	1.0	0.8
254 Kitchen	13	T 32 R F 4 (ELE)	F44LL	118	1.5	SW	1600	2,454.4	13	T 32 R F 4 (ELE)	F44LL	118	1.5	C-OCC	1200	1840.8	613.60	0.00	\$ 131.31	\$ 202.50	\$ 35.00	1.5	1.3
15 Kitchen	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1600	96.0	1	S 32 C F 2 (ELE)	F42LL	60	0.1	C-OCC	1200	72	24.00	0.00	\$ 5.14	\$ 202.50	\$ 35.00	39.4	32.6
254 Kitchen Office	1	T 32 R F 4 (ELE)	F44LL	118	0.1	SW	2400	283.2	1	T 32 R F 4 (ELE)	F44LL	118	0.1	C-OCC	1200	141.6	141.60	0.00	\$ 30.30	\$ 202.50	\$ 35.00	6.7	5.5
5 Kitchen Bathroom	1	2T 32 R F 2 (u) (ELE)	FU2LL	120	0.1	SW	2000	120.0	1	2T 32 R F 2 (u) (ELE)	FU2LL	120	0.1	SW	2000	120	0.00	\$ -	\$ -	\$ -	-	-	-
15 Kitchn Area Mechanical	3	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	1000	180.0	3	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	1000	180	0.00	\$ -	\$ -	\$ -	-	-	-
15 Kitchn Area Mechanical	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	60.0	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	60	0.00	\$ -	\$ -	\$ -	-	-	-
129 Boiler Room	4	SP 75 I	I75/1	75	0.3	SW	1000	300.0	4	SP 75 I	I75/1	75	0.3	SW	1000	300	0.00	\$ -	\$ -	\$ -	-	-	-
108 Boiler Room Faculty Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130.0	1	I 65	I65/1	65	0.1	SW	2000	130	0.00	\$ -	\$ -	\$ -	-	-	-
108 Entryway	1	I 65	I65/1	65	0.1	SW	1000	65.0	1	I 65	I65/1	65	0.1	SW	1000	65	0.00	\$ -	\$ -	\$ -	-	-	-
20 Faculty Room	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1200	153.6	153.60	0.00	\$ 32.87	\$ 202.50	\$ 35.00	6.2	5.1
108 Faculty Room	1	I 65	I65/1	65	0.1	SW	2400	156.0	1	I 65	I65/1	65	0.1	C-OCC	1200	78	78.00	0.00	\$ 16.69	\$ 202.50	\$ 35.00	12.1	10.0
108 Faculty Room Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130.0	1	I 65	I65/1	65	0.1	SW	2000	130	0.00	\$ -	\$ -	\$ -	-	-	-
108 Faculty Room Closet	1	I 65	I65/1	65	0.1	SW	1000	65.0	1	I 65	I65/1	65	0.1	SW	1000	65	0.00	\$ -	\$ -	\$ -	-	-	-
15 Staff Room	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1200	288	288.00	0.00	\$ 61.63	\$ 202.50	\$ 35.00	3.3	2.7
20 Custodian Room	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	153.6	2	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1200	76.8	76.80	0.00	\$ 16.44	\$ 202.50	\$ 35.00	12.3	10.2
15 Central Boy's Bathroom	5	S 32 C F 2 (ELE)	F42LL	60	0.3	SW	2000	600.0	5	S 32 C F 2 (ELE)	F42LL	60	0.3	SW	2000	600	0.00	\$ -	\$ -	\$ -	-	-	-
15 Central Girl's Bathroom	5	S 32 C F 2 (ELE)	F42LL	60	0.3	SW	2000	600.0	5	S 32 C F 2 (ELE)	F42LL	60	0.3	SW	2000	600	0.00	\$ -	\$ -	\$ -	-	-	-
108 Central Closet	1	I 65	I65/1	65	0.1	SW	1000	65.0	1	I 65	I65/1	65	0.1	SW	1000	65	0.00	\$ -	\$ -	\$ -	-	-	-
15 Room 1	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 1	9	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2400	691.2	9	S 32 C F 1 (ELE)	F41LL	32	0.3	C-OCC	1680	483.84	207.36	0.00	\$ 44.38	\$ 202.50	\$ 35.00	4.6	3.8
20 Room 1	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 1	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1680	215.04	92.16	0.00	\$ 19.72	\$ 202.50	\$ 35.00	10.3	8.5
20 Room 1	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	153.6	2	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1680	107.52	46.08	0.00	\$ 9.86	\$ 202.50	\$ 35.00	20.5	17.0
108 Room 1 Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130.0	1	I 65	I65/1	65	0.1	SW	2000	130	0.00	\$ -	\$ -	\$ -	-	-	-
15 Room 2	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 2	9	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2400	691.2	9	S 32 C F 1 (ELE)	F41LL	32	0.3	C-OCC	1680	483.84	207.36	0.00	\$ 44.38	\$ 202.50	\$ 35.00	4.6	3.8
20 Room 2	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1680	215.04	92.16	0.00	\$ 19.72	\$ 202.50	\$ 35.00	10.3	8.5
20 Room 2	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	153.6	2	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1680	107.52	46.08	0.00	\$ 9.86	\$ 202.50	\$ 35.00	20.5	17.0
108 Room 2 Bathroom	1	I 65	I65/1	65	0.1	SW	2000	130.0	1	I 65	I65/1	65	0.1	SW	2000	130	0.00	\$ -	\$ -	\$ -	-	-	-
15 Room 3	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 3	9	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2400	691.2	9	S 32 C F 1 (ELE)	F41LL	32	0.3	C-OCC	1680	483.84	207.36	0.00	\$ 44.38	\$ 202.50	\$ 35.00	4.6	3.8
20 Room 3	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 3	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1680	215.04	92.16	0.00	\$ 19.72	\$ 202.50	\$ 35.00	10.3	8.5
20 Room 3	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	153.6	2	S 32 C F 1 (ELE)	F41LL	3											

Area Description	No. of Fixtures	EXISTING CONDITIONS							RETROFIT CONDITIONS							COST & SAVINGS ANALYSIS							
		Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
20 Room 13	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 13	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 13	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
254 Room 14A	6	T 32 R F 4 (ELE)	F44LL	118	0.7	SW	2400	1,699.2	6	T 32 R F 4 (ELE)	F44LL	118	0.7	C-OCC	1680	1189.44	509.76	0.00	\$ 109.09	\$ 202.50	\$ 35.00	1.9	1.5
254 Room 14B	6	T 32 R F 4 (ELE)	F44LL	118	0.7	SW	2400	1,699.2	6	T 32 R F 4 (ELE)	F44LL	118	0.7	C-OCC	1680	1189.44	509.76	0.00	\$ 109.09	\$ 202.50	\$ 35.00	1.9	1.5
20 Room 15	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 15	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 15	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 15	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 SP Room	6	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	460.8	6	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	322.56	138.24	0.00	\$ 29.58	\$ 202.50	\$ 35.00	6.8	5.7
20 SP Room	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1680	215.04	92.16	0.00	\$ 19.72	\$ 202.50	\$ 35.00	10.3	8.5
20 S. Central Mechanical	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	1000	128.0	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	1000	128	0.00	0.00	\$ -	\$ -	\$ -	-	-
108 S. Central Mechanical	1	I 65	I65/1	65	0.1	SW	1000	65.0	1	I 65	I65/1	65	0.1	SW	1000	65	0.00	0.00	\$ -	\$ -	\$ -	-	-
20 Room 16	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 16	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 16	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 16	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 17	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 17	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 17	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 17	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 18	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 18	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 18	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 18	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 19	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 19	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 19	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 19	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 20	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 20	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 20	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 20	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 21	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 21	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 21	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	1680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 21	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	1680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
213 Room 22	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.1	SW	2400	2,592.0	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.1	C-OCC	1680	1814.4	777.60	0.00	\$ 166.41	\$ 202.50	\$ 35.00	1.2	1.0
213 Room 23	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.1	SW	2400	2,592.0	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.1	C-OCC	1680	1814.4	777.60	0.00	\$ 166.41	\$ 202.50	\$ 35.00	1.2	1.0
213 Room 24	14	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.3	SW	2400	3,024.0	14	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.3	C-OCC	1680	2116.8	907.20	0.00	\$ 194.14	\$ 202.50	\$ 35.00	1.0	0.9
5 Room 24	1	T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2400	144.0	1	T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	C-OCC	1680	100.8	43.20	0.00	\$ 9.24	\$ 202.50	\$ 35.00	21.9	18.1
15 Room 24 Storage 1	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120.0	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 24 Storage 2	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120.0	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 24 Storage 3	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120.0	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Boy's Bathroom	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2000	480.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2000	480	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Girl's Bathroom	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2000	480.0	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2000	480	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Men's Bathroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2000	120.0	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Women's Bathroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2000	120.0	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Closet	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	60.0	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	60	0.00	0.00	\$ -	\$ -	\$ -	-	-
245 Media Center	37	T 32 R F 3 (ELE)	F43LE	110	4.1	SW	2400	9,768.0	37	T 32 R F 3 (ELE)	F43LE	110	4.1	C-OCC	1680	6837.6	2930.40	0.00	\$ 627.11	\$ 202.50	\$ 35.00	0.3	0.3
37 Media Center	4	SP 26 R CF 3	CFQ26/3	99	0.4	SW	2400	950.4	4	SP 26 R CF 3	CFQ26/3	99	0.4	C-OCC	1680	665.28	285.12	0.00	\$ 61.02	\$ 202.50	\$ 35.00	3.3	2.7
5 Media Center	2	T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2400	288.0	2	T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	C-OCC	1680	201.6	86.40	0.00	\$ 18.49	\$ 202.50	\$ 35.00	11.0	9.1
15 Media Center Office	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 C F 2 (ELE)	F42LL	60	0.1	C-OCC	1200	144	144.00	0.00	\$ 30.82	\$ 202.50	\$ 35.00	6.6	5.4
15 Media Center Storage	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120.0	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
254 Computer Room	12	T 32 R F 4 (ELE)	F44LL	118	1.4	SW	2400	3,398.4															

Energy Audit of Franklin Elementary School

CHA Project No.24454

ECM-3 Lighting Replacements with Occupancy Sensors

Cost of Electricity: \$0.214 \$/kWh

\$4.18 \$/kWh

Table with columns: Area Description, No. of Fixtures, Standard Fixture Code, Fixture Code, Watts per Fixture, kW/Space, Exist Control, Annual Hours, Annual kWh, Retrofit Conditions (Number of Fixtures, Standard Fixture Code, Fixture Code, Watts per Fixture, kW/Space, Retrofit Control, Annual Hours, Annual kWh), and COST & SAVINGS ANALYSIS (Annual kWh Saved, Annual kW Saved, Annual \$ Saved, Retrofit Cost, NJ Smart Start Incentive, Simple Payback With Out Incentive, Simple Payback).

Energy Audit of Franklin Elementary School

CHA Project No.24454

ECM-3 Lighting Replacements with Occupancy Sensors

Cost of Electricity: \$0.214 \$/kWh
\$4.18 \$/kW

Area Description	No. of Fixtures	EXISTING CONDITIONS							RETROFIT CONDITIONS							COST & SAVINGS ANALYSIS							
		Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
20 Room 13	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 13	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 13	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	C-OCC	1,680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
254 Room 14A	6	T 32 R F 4 (ELE)	F44LL	118	0.7	SW	2400	1,699	6	T 32 R F 4 (ELE)	F44LL	118	0.708	C-OCC	1,680	1189.44	509.76	0.00	\$ 109.09	\$ 202.50	\$ 35.00	1.9	1.5
254 Room 14B	6	T 32 R F 4 (ELE)	F44LL	118	0.7	SW	2400	1,699	6	T 32 R F 4 (ELE)	F44LL	118	0.708	C-OCC	1,680	1189.44	509.76	0.00	\$ 109.09	\$ 202.50	\$ 35.00	1.9	1.5
20 Room 15	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 15	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 15	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 15	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	C-OCC	1,680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 SP Room	6	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	461	6	S 32 C F 1 (ELE)	F41LL	32	0.192	C-OCC	1,680	322.56	138.24	0.00	\$ 29.58	\$ 202.50	\$ 35.00	6.8	5.7
20 SP Room	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307	4	S 32 C F 1 (ELE)	F41LL	32	0.128	C-OCC	1,680	215.04	92.16	0.00	\$ 19.72	\$ 202.50	\$ 35.00	10.3	8.5
20 S. Central Mechanical	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	1000	128	4	S 32 C F 1 (ELE)	F41LL	32	0.128	SW	1,000	128	0.00	0.00	\$ -	\$ -	\$ -	-	-
108 S. Central Mechanical	1	I65	I65/1	65	0.1	SW	1000	65	1	CF 26	CFQ26/1-L	27	0.027	SW	1,000	27	38.00	0.04	\$ 10.04	\$ 20.25	\$ -	2.0	2.0
20 Room 16	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 16	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 16	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 16	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	C-OCC	1,680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 17	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 17	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 17	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 17	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	C-OCC	1,680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 18	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 18	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 18	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 18	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	C-OCC	1,680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 19	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 19	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 19	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 19	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	C-OCC	1,680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 20	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 20	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 20	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 20	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	C-OCC	1,680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
20 Room 21	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 21	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
20 Room 21	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2400	384	5	S 32 C F 1 (ELE)	F41LL	32	0.16	C-OCC	1,680	268.8	115.20	0.00	\$ 24.65	\$ 202.50	\$ 35.00	8.2	6.8
15 Room 21	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2400	576	4	S 32 C F 2 (ELE)	F42LL	60	0.24	C-OCC	1,680	403.2	172.80	0.00	\$ 36.98	\$ 202.50	\$ 35.00	5.5	4.5
213 Room 22	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.1	SW	2400	2,592	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.08	C-OCC	1,680	1814.4	777.60	0.00	\$ 166.41	\$ 202.50	\$ 35.00	1.2	1.0
213 Room 23	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.1	SW	2400	2,592	12	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.08	C-OCC	1,680	1814.4	777.60	0.00	\$ 166.41	\$ 202.50	\$ 35.00	1.2	1.0
213 Room 24	14	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.3	SW	2400	3,024	14	T 32 R F 3 (ELE) (TWO SWITCH)	F43LL/2	90	1.26	C-OCC	1,680	2116.8	907.20	0.00	\$ 194.14	\$ 202.50	\$ 35.00	1.0	0.9
5 Room 24	1	T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2400	144	1	T 32 R F 2 (u) (ELE)	FU2LL	60	0.06	C-OCC	1,680	100.8	43.20	0.00	\$ 9.24	\$ 202.50	\$ 35.00	21.9	18.1
15 Room 24 Storage 1	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	1,000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 24 Storage 2	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	1,000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 Room 24 Storage 3	2	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	S 32 C F 2 (ELE)	F42LL	60	0.12	SW	1,000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Boy's Bathroom	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2000	480	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2,000	480	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Girl's Bathroom	4	S 32 C F 2 (ELE)	F42LL	60	0.2	SW	2000	480	4	S 32 C F 2 (ELE)	F42LL	60	0.24	SW	2,000	480	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Men's Bathroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2000	120	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2,000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Women's Bathroom	1	S 32 C F 2 (ELE)	F42LL	60	0.1	SW	2000	120	1	S 32 C F 2 (ELE)	F42LL	60	0.06	SW	2,000	120	0.00	0.00	\$ -	\$ -	\$ -	-	-
15 W. Closet	1	S 32 C F 2 (ELE)	F42LL																				

APPENDIX D

**New Jersey Pay For Performance
Incentive Program**

HOME **RESIDENTIAL** **COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT** **RENEWABLE**



COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

PROGRAMS

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[PAY FOR PERFORMANCE](#)

[EXISTING BUILDINGS](#)

[PARTICIPATION STEPS](#)

[APPLICATIONS AND FORMS](#)

[APPROVED PARTNERS](#)

[NEW CONSTRUCTION](#)

[FAQS](#)

[BECOME A PARTNER](#)

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[LOCAL GOVERNMENT ENERGY AUDIT](#)

[LARGE ENERGY USERS PILOT](#)

[ENERGY SAVINGS IMPROVEMENT PLAN](#)

[DIRECT INSTALL](#)

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[ENERGY BENCHMARKING](#)

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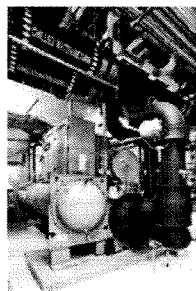
Home » Commercial & Industrial » Programs » Pay for Performance

Pay for Performance - Existing Buildings

Download program applications and incentive forms.

The Greater the Savings, the Greater Your Incentives

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



Eligibility

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

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

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

ENERGY STAR Portfolio Manager

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



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

Incentives

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

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

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

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



Program

[Large Scale CHI Program Annour](#)

[2012 Large Ene Announcement](#)

[Economic Devel Introduces Revc Pay for Perform:](#)

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

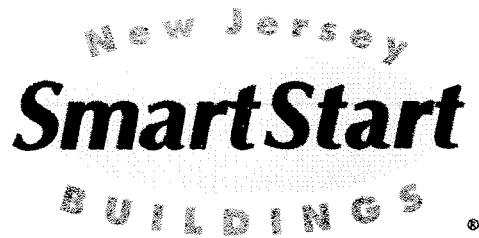
Energy Efficiency Revolving Loan Fund (EE RLF)

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
Maximum Incentive:..... \$50,000 or 50% of facility annual energy cost (whichever is less)

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

Incentive #2: Installation of Recommended Measures

Minimum Performance Target:..... 15%

Electric Incentives

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

Gas Incentives

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

Incentive Cap: 25% of total project cost

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

Incentive #3: Post-Construction Benchmarking Report

Minimum Performance Target:..... 15%

Electric Incentives

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

Gas Incentives

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

Incentive Cap: 25% of total project cost

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

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)	47,260
Is this audit funded by NJ BPU (Y/N)	Yes

Board of Public Utilities (BPU)

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

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	\$69,663	\$35,060
Existing Usage (from utility)	438,000	24,776
Proposed Savings	89,634	2,519
Existing Total MMBtus	3,972	
Proposed Savings MMBtus	558	
% Energy Reduction	14.0%	
Proposed Annual Savings	\$23,200	

	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	\$5,000
Incentive #2	\$0	\$0	\$0
Incentive #3	\$0	\$0	\$0
Total All Incentives	\$0	\$0	\$5,000

Total Project Cost	\$39,514
---------------------------	----------

		Allowable Incentive
% Incentives #1 of Utility Cost*	4.8%	\$5,000
% Incentives #2 of Project Cost**	0.0%	\$0
% Incentives #3 of Project Cost**	0.0%	\$0
Total Eligible Incentives***		\$5,000
Project Cost w/ Incentives		\$34,514

Project Payback (years)	
w/o Incentives	w/ Incentives
1.7	1.5

* Maximum allowable incentive is 50% of annual utility cost if not funded by NJ BPU, and %25 if it is.

** Maximum allowable amount of Incentive #2 is 25% of total project cost.

Maximum allowable amount of Incentive #3 is 25% of total project cost.

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

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

APPENDIX E

Energy Saving Improvement Plan Information



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

HOME

RESIDENTIAL

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

RENEWABLE ENERGY



COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

▼ PROGRAMS

- ▶ NJ SMARTSTART BUILDINGS
- ▶ PAY FOR PERFORMANCE
- ▶ COMBINED HEAT & POWER AND FUEL CELLS
- ▶ LOCAL GOVERNMENT ENERGY AUDIT
- LARGE ENERGY USERS PILOT
- ENERGY SAVINGS IMPROVEMENT PLAN
- ▶ DIRECT INSTALL
- ENERGY BENCHMARKING
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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

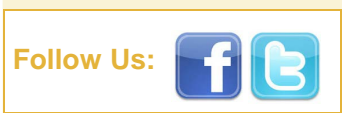
If you have an ESIP plan you would like to submit to the Board of Public Utilities, please email it to ESIP@bpu.state.nj.us. Please limit the file size to 3MB (or break it into smaller files).

- ▶ [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



APPENDIX F

Photovoltaic (PV) Rooftop Solar Power Generation

Photovoltaic (PV) Solar Power Generation - Screening Assessment

**Roxbury Township Board of Education
Franklin Elementary School**

Cost of Electricity	\$0.227	/kWh
Electricity Usage	437,800	kWh/yr
System Unit Cost	\$4,000	/kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
	\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$80,000	20.0	24,979	0	\$5,670	0	\$5,670	\$0	\$1,624	14.1	11.0

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= \$65 /1000kwh

Area Output*

577 m2
6,214 ft2

Perimeter Output*

74 m
243 ft

Available Roof Space for PV:

(Area Output - 10 ft x Perimeter) x 85%
3,213 ft2

Approximate System Size:

Is the roof flat? (Yes/No) **Yes**

8 watt/ft2
25,706 DC watts
20 kW Enter into PV Watts

PV Watts Inputs***

Array Tilt Angle 20 Enter into PV Watts (always 20 if flat, if pitched - enter estimated roof angle)
Array Azimuth 180 Enter into PV Watts (default)
Zip Code 07876 Enter into PV Watts
DC/AC Derate Factor 0.83 Enter into PV Watts

PV Watts Output

24,979 annual kWh calculated in PV Watts program

% Offset Calc

Usage 437,800 (from utilities)
PV Generation 24,979 (generated using PV Watts)
% offset 6%



* <http://www.freemaptools.com/area-calculator.htm>
** <http://www.fletexchange.com>
*** http://gisatnrel.nrel.gov/PVWatts_Viewer/index.html



AC Energy & Cost Savings



(Type comments here to appear on printout; maximum 1 row of 80 characters.)

Station Identification	
City:	Newark
State:	New Jersey
Latitude:	40.70° N
Longitude:	74.17° W
Elevation:	9 m
PV System Specifications	
DC Rating:	230.0 kW
DC to AC Derate Factor:	0.830
AC Rating:	190.9 kW
Array Type:	Fixed Tilt
Array Tilt:	20.0°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	22.7 ¢/kWh

Results			
Month	Solar Radiation (kWh/m ² /day)	AC Energy (kWh)	Energy Value (\$)
1	2.78	16801	3813.83
2	3.54	19357	4394.04
3	4.35	25627	5817.33
4	4.95	27164	6166.23
5	5.69	31538	7159.13
6	5.86	30506	6924.86
7	5.73	30457	6913.74
8	5.47	28773	6531.47
9	4.91	25777	5851.38
10	3.99	22358	5075.27
11	2.68	15007	3406.59
12	2.35	13897	3154.62
Year	4.36	287262	65208.48

Output Hourly Performance Data

Output Results as Text

*

[About the Hourly Performance Data](#)

[Saving Text from a Browser](#)

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

Please send questions and comments regarding PVWATTS to [Webmaster](#)

[Disclaimer and copyright notice](#)



[Return to RReDC home page \(http://www.nrel.gov/rredc\)](http://www.nrel.gov/rredc)

APPENDIX G

EPA Portfolio Manager



STATEMENT OF ENERGY PERFORMANCE

Franklin Elementary School

Building ID: 3209999
 For 12-month Period Ending: May 31, 2012¹
 Date SEP becomes ineligible: N/A

Date SEP Generated: August 17, 2012

Facility
 Franklin Elementary School
 8 Meeker St
 Succasunna, NJ 07876

Facility Owner
 N/A

Primary Contact for this Facility
 N/A

Year Built: 1956
Gross Floor Area (ft²): 47,260

Energy Performance Rating² (1-100) 48

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	1,493,774
Natural Gas (kBtu) ⁴	2,477,550
Total Energy (kBtu)	3,971,324

Energy Intensity⁴

Site (kBtu/ft ² /yr)	84
Source (kBtu/ft ² /yr)	160

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	343
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Electric Distribution Utility

Jersey Central Power & Light Co [FirstEnergy Corp]

National Median Comparison

National Median Site EUI	83
National Median Source EUI	159
% Difference from National Median Source EUI	1%
Building Type	K-12 School

Stamp of Certifying Professional

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

Meets Industry Standards⁵ for Indoor Environmental Conditions:

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

Certifying Professional

N/A

Notes:

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

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

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

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	<input checked="" type="checkbox"/>
Building Name	Franklin Elementary School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		<input type="checkbox"/>
Type	K-12 School	Is this an accurate description of the space in question?		<input type="checkbox"/>
Location	8 Meeker St, Succasunna, NJ 07876	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		<input type="checkbox"/>
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.		<input type="checkbox"/>
School (K-12 School)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	<input checked="" type="checkbox"/>
Gross Floor Area	47,260 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.		<input type="checkbox"/>
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.		<input type="checkbox"/>
Number of PCs	83 (Default)	Is this the number of personal computers in the K12 School?		<input type="checkbox"/>
Number of walk-in refrigeration/freezer units	0 (Default)	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		<input type="checkbox"/>
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".		<input type="checkbox"/>
Percent Cooled	100 % (Default)	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		<input type="checkbox"/>
Percent Heated	100 % (Default)	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		<input type="checkbox"/>
Months	N/A(Optional)	Is this school in operation for at least 8 months of the year?		<input type="checkbox"/>

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'.		<input type="checkbox"/>
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ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

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

Fuel Type: Electricity		
Meter: Electricity (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
05/01/2012	05/31/2012	48,300.00
04/01/2012	04/30/2012	29,400.00
03/01/2012	03/31/2012	34,500.00
02/01/2012	02/29/2012	36,000.00
01/01/2012	01/31/2012	25,500.00
12/01/2011	12/31/2011	49,800.00
11/01/2011	11/30/2011	31,500.00
10/01/2011	10/31/2011	38,400.00
09/01/2011	09/30/2011	30,300.00
08/01/2011	08/31/2011	52,000.00
07/01/2011	07/31/2011	22,200.00
06/01/2011	06/30/2011	39,900.00
Electricity Consumption (kWh (thousand Watt-hours))		437,800.00
Electricity Consumption (kBtu (thousand Btu))		1,493,773.60
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		1,493,773.60
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		<input type="checkbox"/>
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	661.00
04/01/2012	04/30/2012	1,844.50
03/01/2012	03/31/2012	2,798.00
02/01/2012	02/29/2012	5,428.00
01/01/2012	01/31/2012	5,487.40
12/01/2011	12/31/2011	3,778.30
11/01/2011	11/30/2011	3,521.70
10/01/2011	10/31/2011	786.80
09/01/2011	09/30/2011	157.80
08/01/2011	08/31/2011	87.80

07/01/2011	07/31/2011	96.30
06/01/2011	06/30/2011	127.90
Natural Gas Consumption (therms)		24,775.50
Natural Gas Consumption (kBtu (thousand Btu))		2,477,550.00
Total Natural Gas Consumption (kBtu (thousand Btu))		2,477,550.00
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		<input type="checkbox"/>

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	<input type="checkbox"/>

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	<input type="checkbox"/>

Certifying Professional

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

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

Facility
Franklin Elementary School
8 Meeker St
Succasunna, NJ 07876

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Franklin Elementary School	
Gross Floor Area Excluding Parking: (ft ²)	47,260
Year Built	1956
For 12-month Evaluation Period Ending Date:	May 31, 2012

Facility Space Use Summary

School	
Space Type	K-12 School
Gross Floor Area (ft ²)	47,260
Open Weekends? ^d	No
Number of PCs ^d	83
Number of walk-in refrigeration/freezer units ^d	0
Presence of cooking facilities ^d	Yes
Percent Cooled ^d	100
Percent Heated ^d	100
Months ^o	N/A
High School?	No
School District ^o	N/A

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 05/31/2012)	Baseline (Ending Date 07/31/2011)	Rating of 75	Target	National Median
Energy Performance Rating	48	35	75	N/A	50
Energy Intensity					
Site (kBtu/ft ²)	84	102	65	N/A	83
Source (kBtu/ft ²)	160	184	124	N/A	159
Energy Cost					
\$/year	\$ 127,813.56	\$ 146,901.78	\$ 98,852.83	N/A	\$ 126,398.99
\$/ft ² /year	\$ 2.70	\$ 3.11	\$ 2.09	N/A	\$ 2.67
Greenhouse Gas Emissions					
MtCO ₂ e/year	343	396	265	N/A	339
kgCO ₂ e/ft ² /year	7	8	5	N/A	7

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.

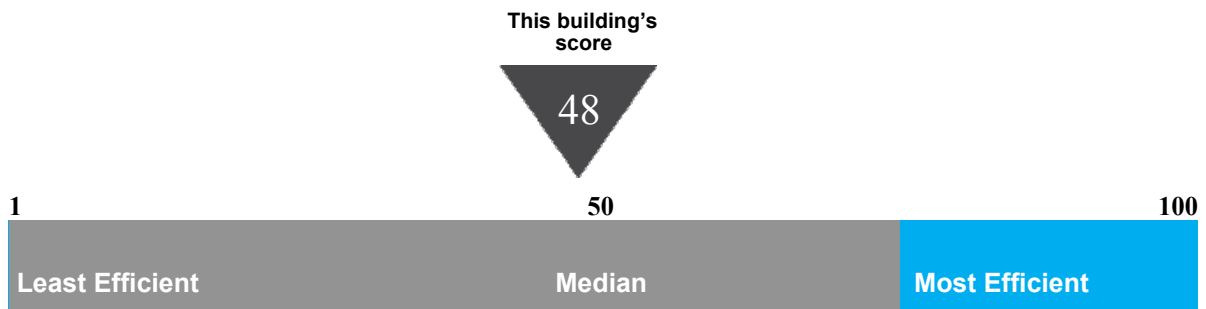
Statement of Energy Performance

2012

Franklin Elementary School
8 Meeker St
Succasunna, NJ 07876

Portfolio Manager Building ID: 3209999

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



This building uses 160 kBtu per square foot per year.*

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

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

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

Date of certification

