Local Government Energy Audit Report

Veterans Memorial Intermediate School

January 3, 2020

Prepared for:

Vineland Public Schools

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Vineland, NJ 08360

Prepared by:

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Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. Most energy conservation measures have received preliminary analysis of feasibility that identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to establish a basis for further discussion and to help prioritize energy measures.

TRC reviewed the energy conservation measures and estimates of energy savings were reviewed for technical accuracy. Actual, achieved energy savings depend on behavioral factors and other uncontrollable variables and, therefore, estimates of final energy savings are not guaranteed. TRC and the New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. Cost estimates include material and labor pricing associated with installation of primary recommended equipment only. Cost estimates do not include demolition or removal of hazardous waste. We encourage the owner of the facility to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual measures and conditions. TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

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

The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

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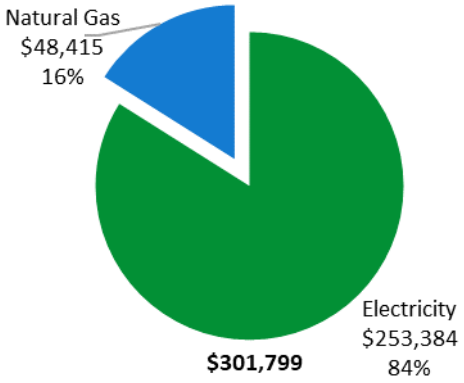
1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Veterans Memorial Intermediate School. This report provides you with information about your facility's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in your facility. TRC conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $301,799 Electricity: 1,570,503 kWh Natural Gas: 37,164 Therms	
ENERGY STAR® Benchmarking Score	14 *(1-100 scale)*	This building performs below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

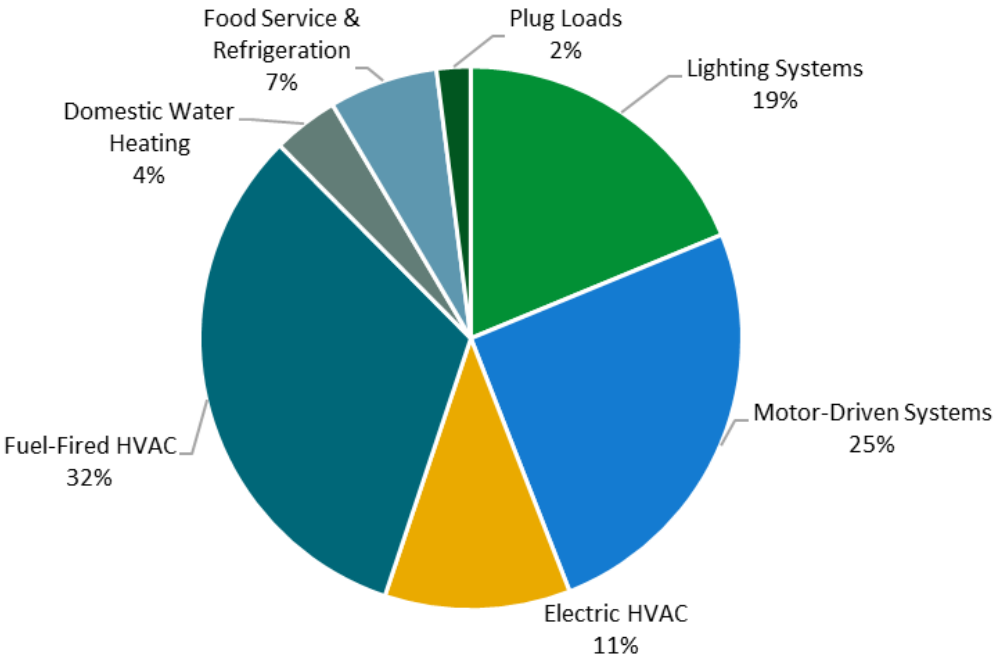


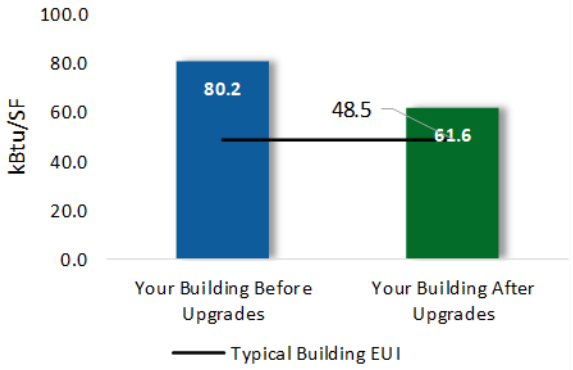
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

This energy audit considered a range of potential energy improvements in your building. Costs and savings will vary between improvements. Presented below are two potential scopes of work for your consideration.

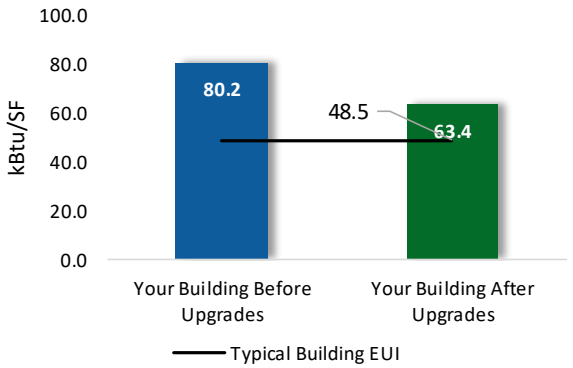
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$498,753
Potential Rebates & Incentives[1]	$108,596
Annual Cost Savings	$99,156
Annual Energy Savings	Electricity: 613,507 kWh Natural Gas: 133 Therms
Greenhouse Gas Emission Savings	310 Tons
Simple Payback	3.9 Years
Site Energy Savings (all utilities)	23%



Scenario 2: Cost Effective Package[2]

Installation Cost	$255,112
Potential Rebates & Incentives	$94,411
Annual Cost Savings	$92,318
Annual Energy Savings	Electricity: 577,865 kWh
Greenhouse Gas Emission Savings	287 Tons
Simple Payback	1.7 Years
Site Energy Savings (all utilities)	21%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

[1] Incentives are based on current SmartStart Prescriptive incentives. Other Program incentives may apply.

[2] A cost-effective measure is defined as one where the simple payback does not exceed two-thirds of the expected proposed equipment useful life. Simple payback is based on the net measure cost after potential incentives.

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**282,834**	**47.9**	**-55**	**$44,914**	**$101,367**	**$0**	**$101,367**	**2.3**	**278,357**
ECM 1	Install LED Fixtures	Yes	31,320	2.5	-3	$5,014	$27,345	$0	$27,345	5.5	31,184
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	2,830	0.5	-1	$449	$1,030	$0	$1,030	2.3	2,781
ECM 3	Retrofit Fixtures with LED Lamps	Yes	248,202	44.8	-51	$39,375	$72,630	$0	$72,630	1.8	243,919
ECM 4	Install LED Exit Signs	Yes	482	0.0	0	$76	$362	$0	$362	4.7	473
Lighting Control Measures			**71,981**	**12.9**	**-15**	**$11,417**	**$48,090**	**$0**	**$48,090**	**4.2**	**70,722**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	65,628	11.8	-14	$10,410	$39,090	$0	$39,090	3.8	64,481
ECM 6	Install High/Low Lighting Controls	Yes	6,352	1.1	-1	$1,008	$9,000	$0	$9,000	8.9	6,241
Variable Frequency Drive (VFD) Measures			**234,153**	**62.9**	**0**	**$37,778**	**$162,461**	**$0**	**$162,461**	**4.3**	**235,791**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	214,051	59.6	0	$34,535	$95,778	$0	$95,778	2.8	215,548
ECM 8	Install VFDs on Chilled Water Pumps	No	16,255	2.9	0	$2,623	$38,331	$0	$38,331	14.6	16,369
ECM 9	Install VFDs on Heating Water Pumps	No	3,847	0.4	0	$621	$28,353	$0	$28,353	45.7	3,874
Electric Unitary HVAC Measures			**7,109**	**7.4**	**0**	**$1,147**	**$81,678**	**$0**	**$81,678**	**71.2**	**7,158**
ECM 10	Install High Efficiency Air Conditioning Units	No	6,396	6.9	0	$1,032	$76,880	$0	$76,880	74.5	6,441
ECM 11	Install High Efficiency Heat Pumps	Yes	712	0.5	0	$115	$4,798	$0	$4,798	41.7	717
Electric Chiller Replacement			**9,143**	**13.1**	**0**	**$1,475**	**$59,084**	**$0**	**$59,084**	**40.1**	**9,207**
ECM 12	Install High Efficiency Chillers	No	9,143	13.1	0	$1,475	$59,084	$0	$59,084	40.1	9,207
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**64**	**$832**	**$26,257**	**$1,600**	**$24,657**	**29.6**	**7,480**
ECM 13	Install High Efficiency Hot Water Boilers	No	0	0.0	8	$102	$10,170	$800	$9,370	91.9	917
ECM 14	Install High Efficiency Furnaces	No	0	0.0	56	$730	$16,087	$800	$15,287	20.9	6,563
Domestic Water Heating Upgrade			**0**	**0.0**	**20**	**$255**	**$14,736**	**$1,785**	**$12,951**	**50.8**	**2,291**
ECM 15	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	20	$255	$14,736	$1,785	$12,951	50.8	2,291
Food Service & Refrigeration Measures			**8,287**	**0.6**	**0**	**$1,337**	**$5,080**	**$0**	**$5,080**	**3.8**	**8,345**
ECM 16	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	3,647	0.4	0	$588	$1,213	$0	$1,213	2.1	3,673
ECM 17	Refrigeration Controls	Yes	4,639	0.2	0	$749	$3,867	$0	$3,867	5.2	4,672
TOTALS (COST EFFECTIVE MEASURES)			**577,865**	**121.5**	**-70**	**$92,318**	**$255,112**	**$0**	**$255,112**	**2.8**	**573,689**
TOTALS (ALL MEASURES)			**613,507**	**144.8**	**13**	**$99,156**	**$498,753**	**$3,385**	**$495,368**	**5.0**	**619,351**

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

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

Figure 2 – Evaluated Energy Improvements

For more detail on each evaluated energy improvement and a break out of cost-effective improvements, see **Section 4: Energy Conservation Measures**.

1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decisions to make, such as:

- How will the project be funded and/or financed?
- Is it best to pursue individual ECMs, groups of ECMs, or use a comprehensive approach where all ECMs are installed together?
- Are there other facility improvements that should happen at the same time?

Pick Your Installation Approach

New Jersey's Clean Energy Programs give you the flexibility to do a little or a lot. Rebates, incentives, and financing are available to help reduce both your installation costs and your energy bills. If you are planning to take advantage of these programs, make sure to review incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives before purchasing materials or starting installation.

The potential ECMs identified for this building likely qualify for multiple incentive and funding programs. Based on current program rules and requirements, your measures are likely to qualify for the following programs:

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Install LED Fixtures			
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers			
ECM 3	Retrofit Fixtures with LED Lamps			
ECM 4	Install LED Exit Signs			
ECM 5	Install Occupancy Sensor Lighting Controls			
ECM 6	Install High/Low Lighting Controls			
ECM 7	Install VFDs on Constant Volume (CV) Fans			
ECM 8	Install VFDs on Chilled Water Pumps			
ECM 9	Install VFDs on Heating Water Pumps			
ECM 10	Install High Efficiency Air Conditioning Units			
ECM 11	Install High Efficiency Heat Pumps			
ECM 12	Install High Efficiency Chillers			
ECM 13	Install High Efficiency Hot Water Boilers	X		X
ECM 14	Install High Efficiency Furnaces	X		X
ECM 15	Install High Efficiency Gas-Fired Water Heater	X		X
ECM 16	Refrigerator/Freezer Case Electrically Commutated Motors			
ECM 17	Refrigeration Controls			

Figure 3 – Funding Options

New Jersey's Clean Energy Programs At-A-Glance

	SmartStart Flexibility to install at your own pace	**Direct Install** Turnkey installation	**Pay for Performance** Whole building upgrades
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

Individual Measures with SmartStart

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

Turnkey Installation with Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures. Direct Install contractors will assess and verify individual measure eligibility and, in most cases, they perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Whole Building Approach with Pay for Performance

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

More Options from Around the State

Financing and Planning Support with the Energy Savings Improvement Program (ESIP)

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the ESIP. Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. You have already taken the first step as an LGEA customer, because this report is required to participate in ESIP.

Resiliency with Return on Investment through Combined Heat & Power (CHP)

The CHP program provides incentives for combined heat and power (aka cogeneration) and waste heat to power projects. Combined heat and power systems generate power on-site and recover heat from the generation system to meet on-site thermal loads. Waste heat to power systems use waste heat to generate power. You will work with a qualified developer who will design a system that meets your building's heating and cooling needs.

Ongoing Electric Savings with Demand Response

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce electric demand during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in demand response (DR) programs. Program participation is voluntary, and facilities receive payments regardless of whether they are called upon to curtail their load during times of peak demand.

2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Veterans Memorial Intermediate School. This report provides information on how your facility uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

TRC conducted this study as part of a comprehensive effort to assist New Jersey educational and local government facilities in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

2.1 Site Overview

On August 7, 2019, TRC performed an energy audit at Veterans Memorial Intermediate School located in Vineland, New Jersey. TRC met with Daniel Biggs to review the facility operations and help focus our investigation on specific energy-using systems.

Veterans Memorial Intermediate School is a three-story, 113,150 square foot building built in 1954 and expanded to accommodate additional spaces in 1998. Spaces include: classrooms, gymnasium, auditorium, library, offices, locker rooms, restrooms, storage, cafeteria, corridors, stairwells, a kitchen and electrical and mechanical space.

Auditorium

2.2 Building Occupancy

The facility is occupied ten months of the year. Typical weekday occupancy is 746 staff and students.

There are no summer or weekend activities.

Building Name	Weekday/Weekend	Operating Schedule
Veterans Memorial Intermediate School	Weekday	6:00 AM to 11:30 PM
	Weekend	Closed

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are brick masonry over structural steel. The roof is flat and covered with black membrane, and it is in fair to good condition.

The walls are made of concrete masonry units (CMUs) with a painted CMU interior finish.

Partial windows replacement was completed in 2001. Most of the windows are double pane glazed with low-e glass and have aluminum frames. The glass-to-frame seals are in good condition. The operable window weather seals are in good condition, showing little evidence of excessive wear. Exterior doors have aluminum and metal frames. Most exterior doors are in fair condition with damaged door seals.

Building Walls

Flat Roof

Aluminum Frames Windows

Exterior Doors

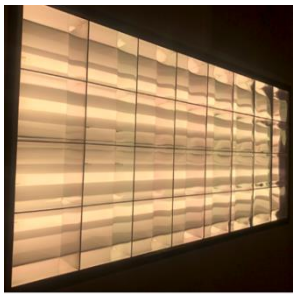
2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. There are also a few 40-Watt T12 fixtures in the old warehouse. Additionally, there are several compact fluorescent lamps (CFL) as well as some incandescent, HID, and LED general purpose lamps. Typically, T8 fluorescent lamps use electronic ballasts and T12 fluorescent lamps use magnetic ballasts.

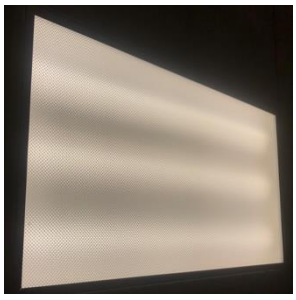
Fixture types include 2-lamp, 3-lamp, or 4-lamp, 2-foot or 4-foot long recessed or surface mounted fixtures and 2-foot fixtures with U-bend or linear tube lamps. Gymnasium fixtures have high bay, high intensity discharge (HID) lamps and are manually controlled. Most exit signs are LED, however, there are a few CFL units. Most fixtures are in good condition. Interior lighting levels were generally sufficient. Lighting fixtures are controlled by wall switches.

Exterior fixtures include wall packs and canopy lights with high intensity discharge (HID), CFL, or LED lamps. The pole-mounted fixtures have high intensity discharge (HID) lamps.

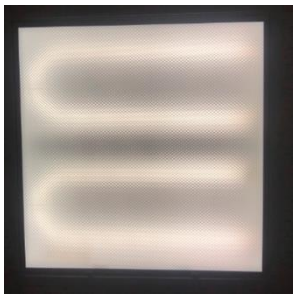
Exterior light fixtures are controlled by a time clock or photocell, depending on the fixture.



Linear T8 Troffer



Linear T8 Surface Mounted



T8 U-Shape Fixture

Recessed CFL Fixture

Gym HID Fixture

CFL Exit Sign

HID Wall Pack Fixture

CFL in Porch Wall Mounted Fixture

5HID Pole Fixture

2.5 Air Handling Systems

Packaged and Split-system Units

The old wing and parts of the newer wing are served by multiple packaged or split-system roof top units. The 3-ton split system units and the 40-ton Trane air-cooled condensing unit have all passed their useful live and appear to be in fair condition. The roof-mounted air handler units have a hot water coil for heating and chilled water coil for cooling. They are all constant air volume units. The units serving the newer wing are controlled by a Trane tracer summit Energy Management System (EMS) while a limited Novar control system controls the old wing.

Refer to the table below for the capacity and efficiency of the split system systems and the air-cooled condensing units.

Unit	Area Served	Size	Efficiency
Ductless Mini-Split AC	AHU-9	3.00 tons cooling	11.50 EER
Ductless Mini-Split AC	AHU-10	3.00 tons cooling	11.50 EER
Ductless Mini-Split AC	AHU-11	3.00 tons cooling	11.50 EER
Ductless Mini-Split AC	AHU-12	3.00 tons cooling	11.50 EER
Ductless Mini-Split HP	Assistant Principal Office	2.00 tons cooling 27.6 MBh heating	12.50 EER 11.6 COP
Air-Cooled Condensing Unit	1998 Wing	40.00 tons cooling 710 MBh heating (gas furnace)	11.50 EER 80% AFUE

Refer to Appendix A for detailed information about each unit.

Trane AHU

Trane Air-Cooled Condensing Unit & Attached Gas-fired Furnace

Split System AC

2.6 Heating Hot Water Systems

A Weil McLain 278 MBh hot water boiler serves the heating load of the old wing of the school. The burner is fully non-modulating with a nominal efficiency of 80%. Three Lochinvar 1,720 MBh hot water boilers serve the newer wings of the school. The burners are fully-modulating with a nominal efficiency of 86%. The old wing boiler and pumps appear to be in fair condition.

The hydronic distribution system is a four-pipe heating only system.

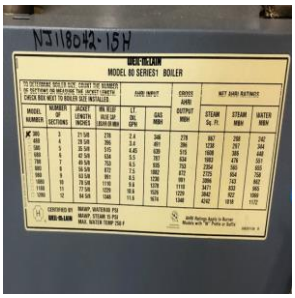
The Weil McLain boiler serves a primary only distribution system with two constant speed 2 hp heating hot water pumps operating in lead/lag fashion.

The Lochinvar boilers serve a primary/secondary distribution system with three constant speed 1 hp pumps circulating the primary loop and two VFD controlled 20 hp heating hot water pumps operating in lead/lag fashion on the secondary loop.

Hot water is supplied to AHUs, fan coils, hydronic baseboards and unit heaters.

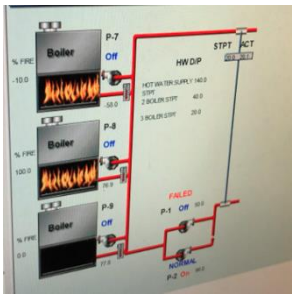
Heating hot water loop for the newer wing is controlled by a Trane Tracer Summit EMS while a limited Novar control system is used to control the old wing hot water loop.

Old Wing Hot Water Boiler



Old Wing Hot Water Pumps

Hot Water Unit Heater



New Wing Condensing Boilers, Hot Water Pumps & Hot Water Control Loop

2.7 Chilled Water Systems

The chiller plant consists of two, 200-ton Trane air-cooled screw chillers and a single 60-ton Trane air-cooled screw chiller. The 60-ton chiller serves the air-handlers in the old wing of the school and is configured in a primary distribution loop with two 7.5 hp constant speed pumps that operate in lead/lag fashion. The chilled water supply temperature is reset (modulated) based on outside air temperature. Chilled water is distributed at 42°F when the outside air temperature is above 60°F and the setpoint is reset to 50°F when the outside air is below 55°F.

The 200-ton chillers operate on a primary-secondary distribution loop with two 7.5 hp constant flow primary pumps and two 25 hp variable flow secondary pumps. The two chillers are controlled using the Trane Tracer Summit EMS.

Chilled water is supplied to AHUs and fan coil units. The chillers are in good condition and well maintained.



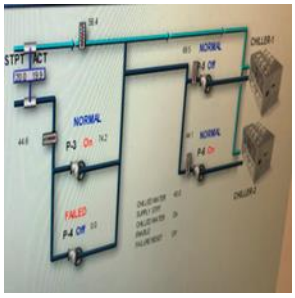
Old Wing Trane Air-Cooled Chiller & Chilled Water Pumps

Newer Wing Chilled Water Pumps

Variable Frequency Drives

Classroom Fan Coil

Newer Wing Air-Cooled Trane Chillers

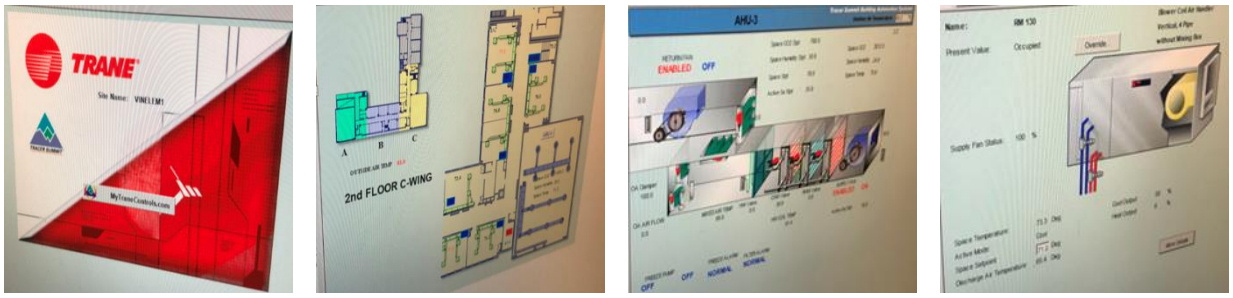


Newer Wing Chilled Water Control Loop

2.8 Building Energy Management Systems (EMS)

A Trane Tracer Summit EMS controls the HVAC equipment, the boilers, the chillers, and the air handlers serving the newer wing. The EMS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, heating water loop temperatures and chilled water loop temperatures.

The old wing HVAC equipment is controlled using the Novar control system for which the site has expressed interest in replacing it and integrating the entire building EMS in one platform.



Trane Tracer Summit EMS

2.9 Domestic Hot Water

Hot water in the old wing is produced with a 140 gallon, 255 MBh gas-fired storage water heater with an 80% efficiency. A 1/6 hp circulation pump distributes water to end uses. The circulation pump operates continuously.

Hot water in the newer wing is also produced by two Lochinvar 750 MBh hot water boilers at an 85% efficiency. Hot water is stored in a 300-gallon tank. Two 1/4 hp circulation pumps distribute water to end uses. The circulation pumps operate continuously.

Old Wing Domestic Hot Water

Newer Wing Domestic Hot Water System

2.10 Food Service Equipment

The kitchen has a mix of gas and electric equipment that is used to prepare meals for students and staff. Most cooking is done using a convection gas-fired oven. Bulk prepared foods are held in electric holding cabinets. Equipment is high efficiency and in good condition.

Visit https://www.energystar.gov/products/commercial_food_service_equipment for the latest information on high efficiency food service equipment.

Kitchen Equipment

2.11 Refrigeration

The kitchen has several stand-up refrigerators with solid doors. There are also a few milk cooler refrigerator chests. All equipment is standard and in good condition.

The walk-in refrigerator has an estimated 0.75-ton compressor located outside near the kitchen and a two-fan evaporator.

The walk-in medium temperature freezer has a 0.75-ton compressor located outside near the kitchen and a two-fan evaporator.

Visit https://www.energystar.gov/products/commercial_food_service_equipment for the latest information on high efficiency food service equipment.

Commercial Refrigerators and Walk-in Cooler and Freezer

Walk-In Evaporators & Condensing Units

2.12 Plug Load & Vending Machines

The location is doing a great job managing their electrical plug loads. This report makes additional suggestions for ECMs in this area as well as Energy Efficient Best Practices.

There are 50 computer work stations and 750 laptops throughout the facility. Plug loads throughout the building include general café and office equipment. There are typical loads such as printers, microwaves, and televisions.

There are several residential-style refrigerators throughout the building. These vary in condition and efficiency.

Combo Washer and Dryer

Kiln

2.13 Water-Using Systems

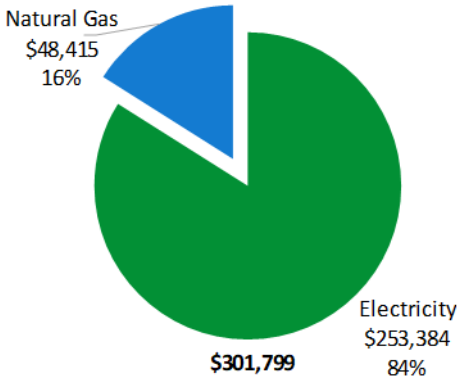
There are restrooms with toilets, urinals, and sinks. Water fixtures are all low-flow.

Typical Restroom Lavatory Sinks and Urinals

3 Energy Use and Costs

Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	1,570,503 kWh	$253,384
Natural Gas	37,164 Therms	$48,415
Total		**$301,799**



An energy balance identifies and quantifies energy use in your various building systems. This can highlight areas with the most potential for improvement. This energy balance was developed using calculated energy use for each of the end uses noted in the figure.

The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated energy use is then compared to the historical energy use and the initial inputs are revised, as necessary, to balance the calculated energy use to the historical energy use.

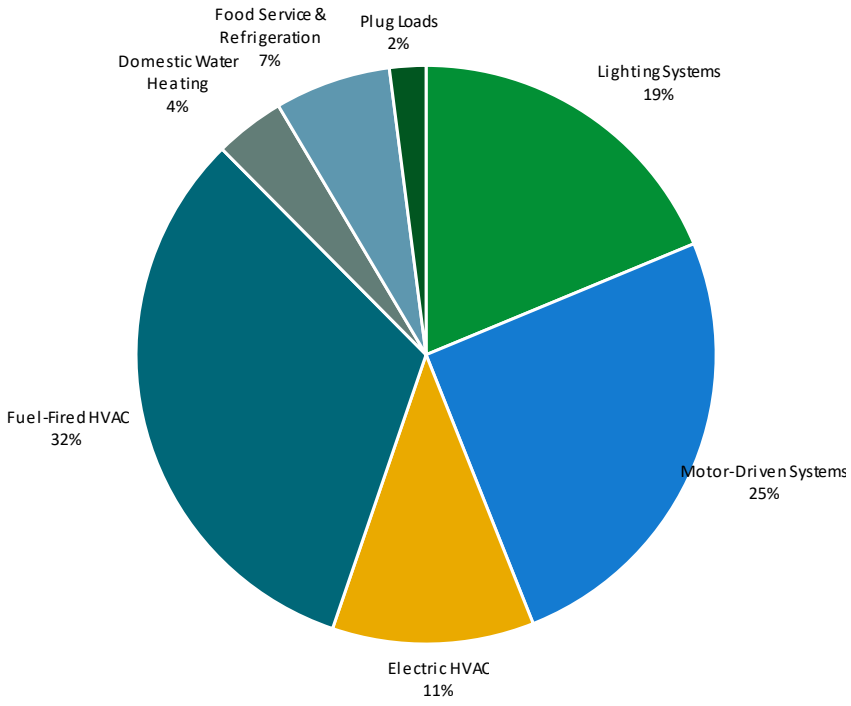
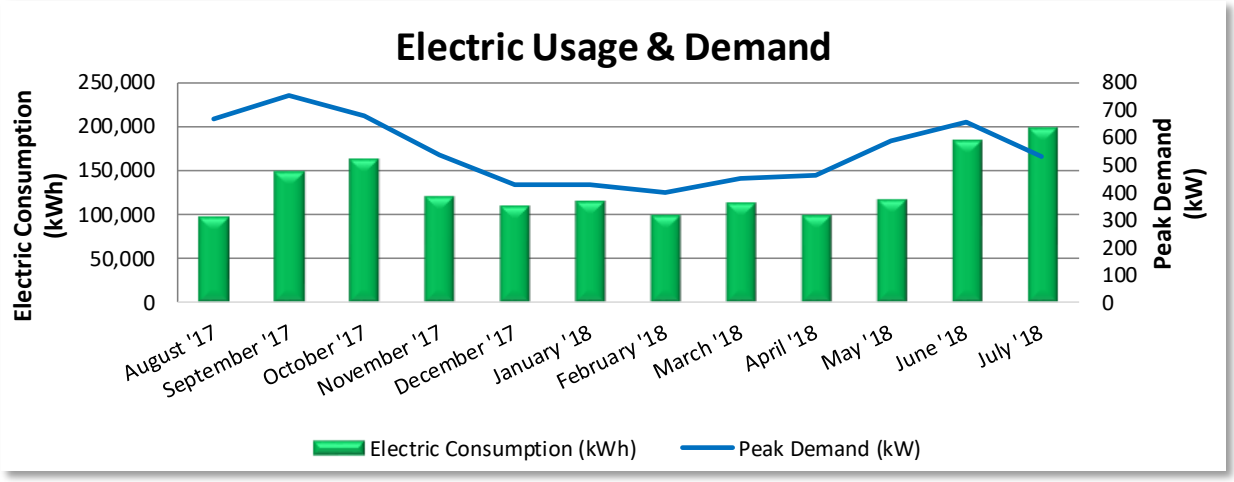


Figure 6 - Energy Balance

3.1 Electricity

City of Vineland delivers and produces electricity under rate class GLP20.



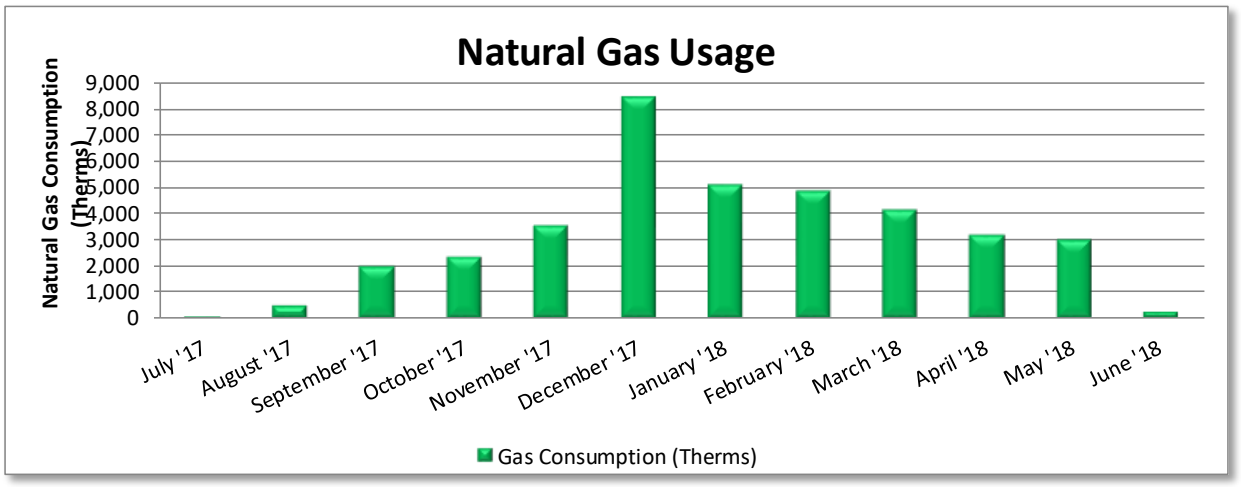
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
8/18/17	28	96,600	665	$4,489	$16,018
9/21/17	34	149,800	752	$7,332	$24,892
10/20/17	29	163,920	677	$6,432	$24,904
11/20/17	31	120,040	539	$5,121	$18,682
12/20/17	30	109,640	426	$4,047	$16,443
1/22/18	33	115,760	430	$4,085	$17,175
2/20/18	29	98,680	401	$3,810	$15,478
3/21/18	29	112,600	453	$4,304	$17,615
4/23/18	33	98,680	461	$4,995	$17,378
5/16/18	23	117,680	587	$6,017	$21,075
6/18/18	33	183,960	655	$6,878	$31,190
7/20/18	32	198,840	530	$5,565	$31,840
Totals	**364**	**1,566,200**	**752**	**$63,072**	**$252,690**
Annual	**365**	**1,570,503**	**752**	**$63,246**	**$253,384**

Notes:

- Peak demand of 752 kW occurred in September 2017.
- Average demand over the past 12 months was 548 kW.
- The average electric cost over the past 12 months was $0.161/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

South Jersey Gas delivers natural gas under rate class General Service FT, with natural gas supply provided by South Jersey Energy, a third-party supplier.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
8/8/17	28	10	$39
9/12/17	35	452	$541
10/6/17	24	1,932	$2,201
11/7/17	32	2,313	$2,678
12/8/17	31	3,502	$4,545
1/10/18	33	8,425	$11,481
2/8/18	29	5,104	$6,959
3/12/18	32	4,841	$6,690
4/10/18	29	4,120	$5,614
5/8/18	28	3,184	$3,692
6/11/18	34	2,973	$3,565
7/10/18	29	205	$278
Totals	**364**	**37,062**	**$48,282**
Annual	**365**	**37,164**	**$48,415**

Notes:

- The average gas cost for the past 12 months is $1.303/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

Your building was benchmarked using the United States Environmental Protection Agency's (EPA) *Portfolio Manager®* software. Benchmarking compares your building's energy use to that of similar buildings across the country, while neutralizing variations due to location, occupancy and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

This ENERGY STAR® benchmarking score provides a comprehensive snapshot of your building's energy performance. It assesses the building's physical assets, operations, and occupant behavior, which is compiled into a quick and easy-to-understand score.

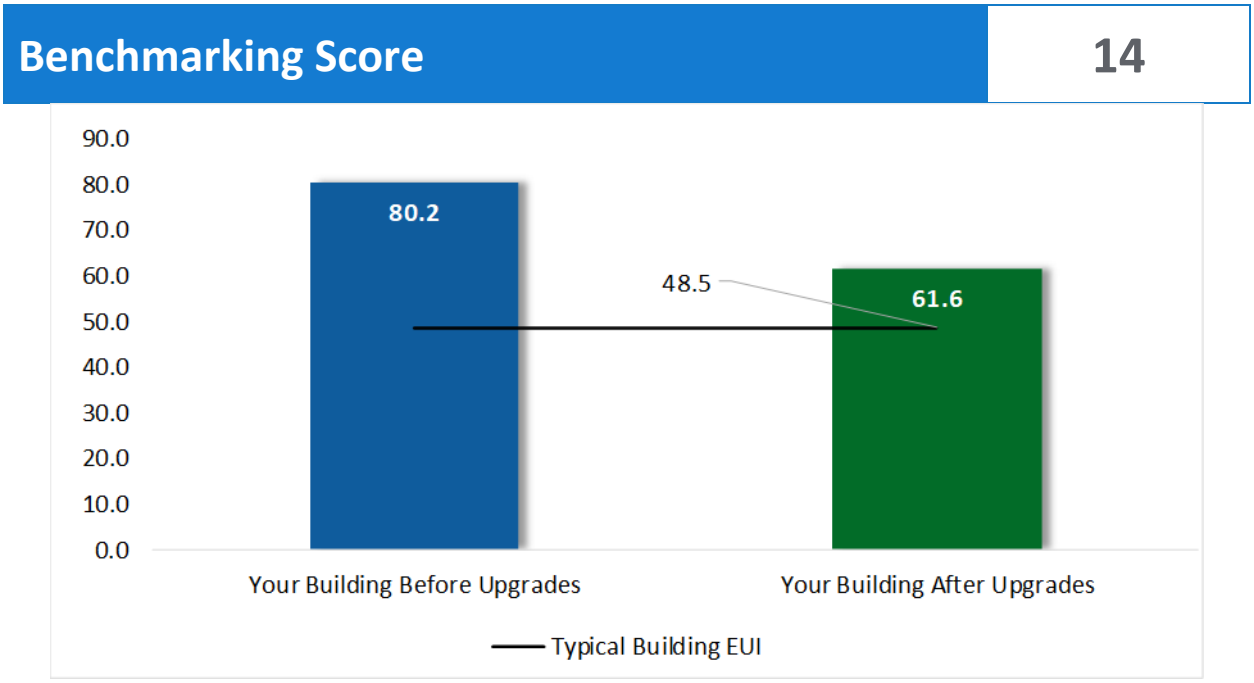


Figure 7 - Energy Use Intensity Comparison[3]

This building performs below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

Energy use intensity (EUI) measures energy consumption per square foot and is the standard metric for comparing buildings' energy performance. A lower EUI means better performance and less energy consumed. A number of factors can cause a building to vary from the "typical" energy usage. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and occupant behavior all contribute to a building's energy use and the benchmarking score.

Tracking Your Energy Performance

[3] Based on all evaluated ECMs

Keeping track of your energy use on a monthly basis is one of the best ways to keep energy costs in check. Update your utility information in Portfolio Manager® regularly, so that you can keep track of your building's performance.

We have created a Portfolio Manager® account for your facility and we have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training.

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[4].

[4] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

4 Energy Conservation Measures

The goal of this audit report is to identify and evaluate potential energy efficiency improvements, provide information about the cost effectiveness of those improvements, and recognize potential financial incentives from NJBPU. Most energy conservation measures have received preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is typically sufficient to demonstrate project cost-effectiveness and help prioritize energy measures.

Calculations of energy use and savings are based on the current version of the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the NJBPU. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances.

Operation and maintenance costs for the proposed new equipment will generally be lower than the current costs for the existing equipment—especially if the existing equipment is at or past its normal useful life. We have conservatively assumed there to be no impact on overall maintenance costs over the life of the equipment.

Financial incentives are based on the current NJCEP prescriptive SmartStart program. A higher level of investigation may be necessary to support any SmartStart Custom, Pay for Performance, or Direct Install incentive applications. Some measures and proposed upgrades may be eligible for higher incentives than those shown below through other NJCEP programs described in a following section of this report.

For a detailed list of the locations and recommended energy conservation measures for all inventoried equipment, see Appendix A: Equipment Inventory & Recommendations

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**282,834**	**47.9**	**-55**	**$44,914**	**$101,367**	**$0**	**$101,367**	**2.3**	**278,357**
ECM 1	Install LED Fixtures	Yes	31,320	2.5	-3	$5,014	$27,345	$0	$27,345	5.5	31,184
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	2,830	0.5	-1	$449	$1,030	$0	$1,030	2.3	2,781
ECM 3	Retrofit Fixtures with LED Lamps	Yes	248,202	44.8	-51	$39,375	$72,630	$0	$72,630	1.8	243,919
ECM 4	Install LED Exit Signs	Yes	482	0.0	0	$76	$362	$0	$362	4.7	473
Lighting Control Measures			**71,981**	**12.9**	**-15**	**$11,417**	**$48,090**	**$0**	**$48,090**	**4.2**	**70,722**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	65,628	11.8	-14	$10,410	$39,090	$0	$39,090	3.8	64,481
ECM 6	Install High/Low Lighting Controls	Yes	6,352	1.1	-1	$1,008	$9,000	$0	$9,000	8.9	6,241
Variable Frequency Drive (VFD) Measures			**234,153**	**62.9**	**0**	**$37,778**	**$162,461**	**$0**	**$162,461**	**4.3**	**235,791**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	214,051	59.6	0	$34,535	$95,778	$0	$95,778	2.8	215,548
ECM 8	Install VFDs on Chilled Water Pumps	No	16,255	2.9	0	$2,623	$38,331	$0	$38,331	14.6	16,369
ECM 9	Install VFDs on Heating Water Pumps	No	3,847	0.4	0	$621	$28,353	$0	$28,353	45.7	3,874
Electric Unitary HVAC Measures			**7,109**	**7.4**	**0**	**$1,147**	**$81,678**	**$0**	**$81,678**	**71.2**	**7,158**
ECM 10	Install High Efficiency Air Conditioning Units	No	6,396	6.9	0	$1,032	$76,880	$0	$76,880	74.5	6,441
ECM 11	Install High Efficiency Heat Pumps	Yes	712	0.5	0	$115	$4,798	$0	$4,798	41.7	717
Electric Chiller Replacement			**9,143**	**13.1**	**0**	**$1,475**	**$59,084**	**$0**	**$59,084**	**40.1**	**9,207**
ECM 12	Install High Efficiency Chillers	No	9,143	13.1	0	$1,475	$59,084	$0	$59,084	40.1	9,207
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**64**	**$832**	**$26,257**	**$1,600**	**$24,657**	**29.6**	**7,480**
ECM 13	Install High Efficiency Hot Water Boilers	No	0	0.0	8	$102	$10,170	$800	$9,370	91.9	917
ECM 14	Install High Efficiency Furnaces	No	0	0.0	56	$730	$16,087	$800	$15,287	20.9	6,563
Domestic Water Heating Upgrade			**0**	**0.0**	**20**	**$255**	**$14,736**	**$1,785**	**$12,951**	**50.8**	**2,291**
ECM 15	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	20	$255	$14,736	$1,785	$12,951	50.8	2,291
Food Service & Refrigeration Measures			**8,287**	**0.6**	**0**	**$1,337**	**$5,080**	**$0**	**$5,080**	**3.8**	**8,345**
ECM 16	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	3,647	0.4	0	$588	$1,213	$0	$1,213	2.1	3,673
ECM 17	Refrigeration Controls	Yes	4,639	0.2	0	$749	$3,867	$0	$3,867	5.2	4,672
TOTALS			**613,507**	**144.8**	**13**	**$99,156**	**$498,753**	**$3,385**	**$495,368**	**5.0**	**619,351**

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

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

Figure 8 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**282,834**	**47.9**	**-55**	**$44,914**	**$101,367**	**$0**	**$101,367**	**2.3**	**278,357**
ECM 1	Install LED Fixtures	31,320	2.5	-3	$5,014	$27,345	$0	$27,345	5.5	31,184
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,830	0.5	-1	$449	$1,030	$0	$1,030	2.3	2,781
ECM 3	Retrofit Fixtures with LED Lamps	248,202	44.8	-51	$39,375	$72,630	$0	$72,630	1.8	243,919
ECM 4	Install LED Exit Signs	482	0.0	0	$76	$362	$0	$362	4.7	473
Lighting Control Measures		**71,981**	**12.9**	**-15**	**$11,417**	**$48,090**	**$0**	**$48,090**	**4.2**	**70,722**
ECM 5	Install Occupancy Sensor Lighting Controls	65,628	11.8	-14	$10,410	$39,090	$0	$39,090	3.8	64,481
ECM 6	Install High/Low Lighting Controls	6,352	1.1	-1	$1,008	$9,000	$0	$9,000	8.9	6,241
Variable Frequency Drive (VFD) Measures		**214,051**	**59.6**	**0**	**$34,535**	**$95,778**	**$0**	**$95,778**	**2.8**	**215,548**
ECM 7	Install VFDs on Constant Volume (CV) Fans	214,051	59.6	0	$34,535	$95,778	$0	$95,778	2.8	215,548
Electric Unitary HVAC Measures		**712**	**0.5**	**0**	**$115**	**$4,798**	**$0**	**$4,798**	**41.7**	**717**
ECM 11	Install High Efficiency Heat Pumps	712	0.5	0	$115	$4,798	$0	$4,798	41.7	717
Food Service & Refrigeration Measures		**8,287**	**0.6**	**0**	**$1,337**	**$5,080**	**$0**	**$5,080**	**3.8**	**8,345**
ECM 16	Refrigerator/Freezer Case Electrically Commutated Motors	3,647	0.4	0	$588	$1,213	$0	$1,213	2.1	3,673
ECM 17	Refrigeration Controls	4,639	0.2	0	$749	$3,867	$0	$3,867	5.2	4,672
TOTALS		**577,865**	**121.5**	**-70**	**$92,318**	**$255,112**	**$0**	**$255,112**	**2.8**	**573,689**

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

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

Figure 9 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**282,834**	**47.9**	**-55**	**$44,914**	**$101,367**	**$0**	**$101,367**	**2.3**	**278,357**
ECM 1	Install LED Fixtures	31,320	2.5	-3	$5,014	$27,345	$0	$27,345	5.5	31,184
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,830	0.5	-1	$449	$1,030	$0	$1,030	2.3	2,781
ECM 3	Retrofit Fixtures with LED Lamps	248,202	44.8	-51	$39,375	$72,630	$0	$72,630	1.8	243,919
ECM 4	Install LED Exit Signs	482	0.0	0	$76	$362	$0	$362	4.7	473

When considering lighting upgrades, we suggest using a comprehensive design approach that simultaneously upgrades lighting fixtures and controls to maximize energy savings and improve occupant lighting. Comprehensive design will also consider appropriate lighting levels for different space types to make sure that the right amount of light is delivered where needed. If conversion to LED light sources are proposed, we suggest converting all of a specific lighting type (e.g., linear fluorescent) to LED lamps to minimize the number of lamp types in use at the facility, which should help reduce future maintenance costs.

ECM 1: Install LED Fixtures

Replace existing fixtures containing HID lamps with new LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

In some cases, HID fixtures can be retrofit with screw-based LED lamps. Replacing an existing HID fixture with a new LED fixture will generally provide better overall lighting optics; however, replacing the HID lamp with a LED screw-in lamp is typically a less expensive retrofit. We recommend you work with your lighting contractor to determine which retrofit solution is best suited to your needs and will be compatible with the existing fixture(s).

Maintenance savings may also be achieved since LED lamps last longer than other light sources and therefore do not need to be replaced as often.

Affected building areas: gymnasium, exterior fixtures

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Retrofit fluorescent fixtures by removing the fluorescent tubes and ballasts and replacing them with LED tubes and LED drivers (if necessary), which are designed to be used in retrofitted fluorescent fixtures.

The measure uses the existing fixture housing but replaces the electric components with more efficient lighting technology which use less power than other lighting technologies but provides equivalent lighting output. Maintenance savings may also be achieved since LED tubes last longer than fluorescent tubes and therefore do not need to be replaced as often.

Affected building areas: T12 lamps in old food warehouse

ECM 3: Retrofit Fixtures with LED Lamps

Replace fluorescent and incandescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as a direct replacement for most other lighting technologies.

This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space. Maintenance savings may also be available, as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

Affected building areas: all areas with fluorescent fixtures with T8 tubes; halogen incandescent lamps in auditorium; and restrooms, hallways, and storage rooms with CFLs

ECM 4: Install LED Exit Signs

Replace compact fluorescent exit signs with LED exit signs. LED exit signs require virtually no maintenance and have a life expectancy of at least 20 years. This measure saves energy by installing LED fixtures, which use less power than other technologies with an equivalent lighting output. Maintenance savings and improved reliability may also be achieved, as the longer-lasting LED lamps will not need to be replaced as often as the existing lamps.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**71,981**	**12.9**	**-15**	**$11,417**	**$48,090**	**$0**	**$48,090**	**4.2**	**70,722**
ECM 5	Install Occupancy Sensor Lighting Controls	65,628	11.8	-14	$10,410	$39,090	$0	$39,090	3.8	64,481
ECM 6	Install High/Low Lighting Controls	6,352	1.1	-1	$1,008	$9,000	$0	$9,000	8.9	6,241

Lighting controls reduce energy use by turning off or lowering lighting fixture power levels when not in use. A comprehensive approach to lighting design should upgrade the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 5: Install Occupancy Sensor Lighting Controls

Install occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend that lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

Occupancy sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Most occupancy sensor lighting controls allow users to manually turn fixtures on/off, as needed. Some controls can also provide dimming options.

Occupancy sensors can be mounted on the wall at existing switch locations, mounted on the ceiling, or in remote locations. In general, wall switch replacement sensors are best suited to single occupant offices and other small rooms. Ceiling-mounted or remote mounted sensors are used in large spaces, locations without local switching, and where wall switches are not in the line-of-sight of the main work area.

This measure provides energy savings by reducing the lighting operating hours.

Affected building areas: offices, conference rooms, classrooms, gymnasium, kitchen, library, locker rooms, restrooms, and storage rooms

ECM 6: Install High/Low Lighting Controls

Install occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons.

Lighting fixtures with these controls operate at default low levels when the area is unoccupied to provide minimal lighting to meet security or safety code requirements for egress. Sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Fixtures automatically switch back to low level after a predefined period of vacancy. In parking lots and parking garages with significant ambient lighting, this control can sometimes be combined with photocell controls to turn the lights off when there is sufficient daylight.

The controller lowers the light level by dimming the fixture output. Therefore, the controlled fixtures need to have a dimmable ballast or driver. This will need to be taken into account when selecting retrofit lamps and bulbs for the areas proposed for high/low control.

This measure provides energy savings by reducing the light fixture power draw when reduced light output is appropriate.

Affected building areas: hallways, stairwells

For this type of measure the occupancy sensors will generally be ceiling or fixture mounted. Sufficient sensor coverage must be provided to ensure that lights turn on in each area as an occupant approaches.

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**234,153**	**62.9**	**0**	**$37,778**	**$162,461**	**$0**	**$162,461**	**4.3**	**235,791**
ECM 7	Install VFDs on Constant Volume (CV) Fans	214,051	59.6	0	$34,535	$95,778	$0	$95,778	2.8	215,548
ECM 8	Install VFDs on Chilled Water Pumps	16,255	2.9	0	$2,623	$38,331	$0	$38,331	14.6	16,369
ECM 9	Install VFDs on Heating Water Pumps	3,847	0.4	0	$621	$28,353	$0	$28,353	45.7	3,874

Variable frequency drives control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new inverter duty rated motor to conservatively account for the cost of an inverter duty rated motor.

ECM 7: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one.

Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone, while maintaining a constant supply air temperature.

VAV system controls should not raise the supply air temperature at the expense of the fan power. A common mistake is to reset the supply air temperature to achieve chiller energy savings, which can lead to additional air flow requirements. Supply air temperature should be kept low (e.g. 55°F) until the minimum fan speed (typically about 50%) is met. At this point, it is efficient to raise the supply air temperature as the load decreases, but not such that additional air flow and thus fan energy is required.

For air handlers with direct expansion (DX) cooling systems, such as the old wing AHU, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. Prior to implementation, verify minimum fan speed in cooling mode with the manufacturer. Note that savings will vary depending on the operating characteristics of each AHU.

Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

Affected air handlers: old wing AHU; OAU-1 and 2; AHU-1, 3 and 4

ECM 8: Install VFDs on Chilled Water Pumps

We evaluated installing VFDs to control chilled water pumps. Two-way valves must serve the chilled water coils being served and the chilled water loop must have a differential pressure sensor installed. If three-way valves or a bypass leg are used in the chilled water distribution they will need to be modified when this measure is implemented. As the chilled water valves close, the differential pressure increases, and the VFD modulates the pump speed to maintain a differential pressure setpoint.

For systems with variable chilled water flow through the chiller, the minimum flow to prevent the chiller from tripping off will need to be determined during the final project design. The control system should be programmed to maintain the minimum flow through the chiller and to prevent pump cavitation.

Energy savings result from reducing the pump motor speed (and power) as chilled water valves close. The magnitude of energy savings is based on the estimated amount of time that the system operates at reduced loads.

Affected pumps: old wing chilled water pumps (P-3 and 4)

ECM 9: Install VFDs on Heating Water Pumps

We evaluated installing VFDs to control heating water pumps. Two-way valves must serve the hot water coils and the hot water loop must have a differential pressure sensor installed. If three-way valves or a bypass leg are used in the hot water distribution they will need to be modified when this measure is implemented. As the hot water valves close, the differential pressure increases and the VFD modulates the pump speed to maintain a differential pressure setpoint.

Energy savings result from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

Affected pumps: old wing hot water pumps (P-1 and 2)

4.4 Electric Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**7,109**	**7.4**	**0**	**$1,147**	**$81,678**	**$0**	**$81,678**	**71.2**	**7,158**
ECM 10	Install High Efficiency Air Conditioning Units	6,396	6.9	0	$1,032	$76,880	$0	$76,880	74.5	6,441
ECM 11	Install High Efficiency Heat Pumps	712	0.5	0	$115	$4,798	$0	$4,798	41.7	717

Replacing the unitary HVAC units has a long payback period and may not be justifiable based simply on energy considerations. However, most of the units at this facility are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high efficiency unit can be justified by the marginal savings from the improved efficiency. When the split-system units are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 10: Install High Efficiency Air Conditioning Units

We evaluated replacing standard efficiency packaged and split system air conditioning units with high efficiency packaged and split system air conditioning units. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high efficiency unit, the average cooling load, and the estimated annual operating hours.

Affected units: ductless mini-splits serving AHU-9, 10, 11, and 12

4.5 Electric Chillers

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Chiller Replacement		**9,143**	**13.1**	**0**	**$1,475**	**$59,084**	**$0**	**$59,084**	**40.1**	**9,207**
ECM 12	Install High Efficiency Chillers	9,143	13.1	0	$1,475	$59,084	$0	$59,084	40.1	9,207

ECM 11: Install High Efficiency Chillers

We evaluated replacing the older 60-ton inefficient electric chiller with a new high efficiency chiller. The type of chiller to be installed depends on the magnitude of the cooling load and variability of the cooling load profile, for example:

- Positive displacement chillers are usually under 600 tons of cooling capacity and centrifugal chillers generally start at 150 tons of cooling capacity.
- Constant speed chillers should be used to meet cooling loads with little or no variation while variable speed chillers are more efficient for variable cooling load profiles.
- Water cooled chillers are more efficient than air cooled chillers but require cooling towers and additional pumps to circulate the cooling water.
- In any given size range, variable speed chillers tend to have better partial load efficiency, but worse full load efficiency, than constant speed chillers.

Energy savings result from the improvement in chiller efficiency and matching the right type of chiller to the cooling load. The energy savings are calculated based on the cooling capacity of the new chiller, the improvement in efficiency compared with the base case equipment, the cooling load profile, and the estimated annual operating hours of the chiller before and after the upgrade.

For the purposes of this analysis, we evaluated the replacement of chillers on a one-for-one basis with equipment of the same capacity. We recommend that you work with your design team to select chillers that are sized appropriately for the cooling load at this facility. In some cases, the plant energy use can be reduced by selecting multiple chillers that match the facility load profile rather than one or two large chillers. This can also improve the chiller plant reliability through increased redundancy. Energy savings are maximized by proper selection of new equipment based on the cooling load profile.

Replacing the 60-ton chiller has a long payback based on energy savings and may not be justifiable based simply on energy considerations. However, the chiller has reached the end of its normal useful life. Typically, the marginal cost of purchasing a high efficiency chiller can be justified by the marginal savings from the improved efficiency. When the chiller is eventually replaced, consider purchasing equipment that exceed the minimum efficiency required by building codes.

4.6 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**64**	**$832**	**$26,257**	**$1,600**	**$24,657**	**29.6**	**7,480**
ECM 13	Install High Efficiency Hot Water Boilers	0	0.0	8	$102	$10,170	$800	$9,370	91.9	917
ECM 14	Install High Efficiency Furnaces	0	0.0	56	$730	$16,087	$800	$15,287	20.9	6,563

ECM 12: Install High Efficiency Hot Water Boilers

We evaluated replacing older inefficient hot water boilers with high efficiency hot water boilers. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

The most notable efficiency improvement is condensing hydronic boilers which can achieve over 90% efficiency under the proper conditions. Condensing hydronic boilers typically operate at efficiencies between 85% and 87% (comparable to other high efficiency boilers) when the return water temperature is above 130°F. The boiler efficiency increases as the return water temperature drops below 130°F. Therefore, condensing hydronic boilers are evaluated when the return water temperature is less than 130°F during most of the operating hours.

For the purposes of this analysis, we evaluated the replacement of boilers on a one-for-one basis with equipment of the same capacity. We recommend that you work with your mechanical design team to select boilers that are sized appropriately for the heating load at this facility. In many cases installing multiple modular boilers rather than one or two large boilers will result in higher overall plant efficiency while providing additional system redundancy.

Replacing the boilers has a long payback and may not be justifiable based simply on energy considerations. However, the boilers [are nearing, have reached] the end of their normal useful life. Typically, the marginal cost of purchasing high efficiency boilers can be justified by the marginal savings from the improved efficiency. When the boiler is eventually replaced, consider purchasing boilers that exceed the minimum efficiency required by building codes. We also recommend working with your mechanical design team to

determine whether the heating system can operate with return water temperatures below 130°F, which would allow the use of condensing boilers.

ECM 13: Install High Efficiency Furnaces

We evaluated replacing standard efficiency furnaces with condensing furnaces. Improved combustion technology and heat exchanger design optimize heat recovery from the combustion gases which can significantly improve furnace efficiency. Savings result from improved system efficiency.

Note: these units produce acidic condensate that requires proper drainage.

Affected units: old wing rooftop split-system AC unit

4.7 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**20**	**$255**	**$14,736**	**$1,785**	**$12,951**	**50.8**	**2,291**
ECM 15	Install High Efficiency Gas-Fired Water Heater	0	0.0	20	$255	$14,736	$1,785	$12,951	50.8	2,291

ECM 14: Install High Efficiency Gas-Fired Water Heater

Replace the existing tank water heater with a high efficiency condensing tank water heater. Energy savings result from the increased efficiency of the unit, which uses less gas to heat water, and fewer operating hours to maintain the tank water temperature.

4.8 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**8,287**	**0.6**	**0**	**$1,337**	**$5,080**	**$0**	**$5,080**	**3.8**	**8,345**
ECM 16	Refrigerator/Freezer Case Electrically Commutated Motors	3,647	0.4	0	$588	$1,213	$0	$1,213	2.1	3,673
ECM 17	Refrigeration Controls	4,639	0.2	0	$749	$3,867	$0	$3,867	5.2	4,672

ECM 15: Refrigerator/Freezer Case Electrically Commutated Motors

Replace shaded pole or permanent split capacitor (PSC) motors with electronically commutated (EC) motors in walk-in cooler and freezer. Fractional horsepower EC motors are significantly more efficient than mechanically commutated, brushed motors, particularly at low speeds or partial load. By using variable-speed technology, EC motors can optimize fan usage. Because these motors are brushless and use DC power, losses due to friction and phase shifting are eliminated.

Savings for this measure consider both the increased efficiency of the motor as well as the reduction in refrigeration load due to motor heat loss.

ECM 16: Refrigeration Controls

Install additional controls to optimize the operation of walk-in coolers and freezers.

Defrost controllers can be used to override defrost of evaporator fans when the defrost operation is not necessary, which reduces annual energy consumption. This measure is applicable to existing evaporator fans with a traditional electric defrost mechanism.

Many walk-in coolers and freezers have evaporator fans that run continuously. The measure adds a control system feature to automatically shut off evaporator fans when not needed.

Energy savings for each of the control measures account for reduction in compressor and fan operating hours as well as reduction in the refrigeration heat load as appropriate.

5 Energy Efficient Best Practices

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs. You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[5]. Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Lighting Maintenance

Clean lamps, reflectors and lenses of dirt, dust, oil, and smoke buildup every six to twelve months. Light levels decrease over time due to lamp aging, lamp and ballast failure, and buildup of dirt and dust. Together, this can reduce total light output by up to 60% while still drawing full power.

In addition to routine cleaning, developing a maintenance schedule can ensure that maintenance is performed regularly, and it can reduce the overall cost of fixture re-lamping and re-ballasting. Group re-lamping and re-ballasting maintains lighting levels and minimizes the number of site visits by a lighting technician or contractor, decreasing the overall cost of maintenance.

Motor Maintenance

Motors have many moving parts. As these parts degrade over time, the efficiency of the motor is reduced. Routine maintenance prevents damage to motor components. Routine maintenance should include cleaning surfaces and ventilation openings on motors to prevent overheating, lubricating moving parts to reduce friction, inspecting belts and pulleys for wear and to ensure they are at proper alignment and tension, and cleaning and lubricating bearings. Consult a licensed technician to assess these and other motor maintenance strategies.

Chiller Maintenance

Service chillers regularly to keep them operating properly. Chillers are responsible for a substantial portion of a commercial building's overall energy usage and when they do not work well, there is usually a noticeable increase in energy bills and increased occupant complaints. Regular diagnostics and service can save five to ten percent of the cost of operating your chiller. If you already have a maintenance contract in place, your existing service company should be able to provide these services.

[5] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager.

AC System Evaporator/Condenser Coil Cleaning

Dirty evaporator and condenser coils restrict air flow and restrict heat transfer. This increases the loads on the evaporator and condenser fan and decreases overall cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time, filters become less and less effective as particulate buildup increases. Dirty filters also restrict air flow through the air conditioning or heat pump system, which increases the load on the distribution fans.

Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the water side or fire side of the boiler.

Water Heater Maintenance

Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. At least once a year, follow manufacturer instructions to drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Annual checks should include checks for:

- Leaks or heavy corrosion on the pipes and valves.
- Corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot, or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional.
- For electric water heaters, look for signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank.
- For water heaters more than three years old, have a technician inspect the sacrificial anode annually.

Water Conservation

Installing dual flush or low-flow toilets and low-flow/waterless urinals are ways to reduce water use. The EPA WaterSense® ratings for urinals is 0.5 gallons per flush (gpf) and for flush valve toilets is 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

For more information regarding water conservation go to the EPA's WaterSense® website[6] or download a copy of EPA's "WaterSense® at Work: Best Management Practices for Commercial and Institutional Facilities"[7] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water conservation devices that do not reduce hot water consumption will not provide energy savings at the site level, but they may significantly affect your water and sewer usage costs. Any reduction in water use does however ultimately reduce grid-level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users.

If the facility has detached buildings with a master water meter for the entire campus, check for unnatural wet areas in the lawn or water seeping in the foundation at water pipe penetrations through the foundation. Periodically check overnight meter readings when the facility is unoccupied, and there is no other scheduled water usage.

Manage irrigation systems to use water more effectively outside the building. Adjust spray patterns so that water lands on intended lawns and plantings and not on pavement and walls. Consider installing an evapotranspiration irrigation controller that will prevent over-watering.

Procurement Strategies

Purchasing efficient products reduces energy costs without compromising quality. Consider modifying your procurement policies and language to require ENERGY STAR® or WaterSense® products where available.

[6] https://www.epa.gov/watersense.

[7] https://www.epa.gov/watersense/watersense-work-0.

6 On-site Generation

You don't have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the facility's electric energy needs. Also referred to as distributed generation, these systems contribute to greenhouse gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, which results in improved electric grid reliability through better use of transmission and distribution systems.

Preliminary screenings were performed to determine if an on-site generation measure could be a cost-effective solution for your facility. Before deciding to install an on-site generation system, we recommend conducting a feasibility study to analyze existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

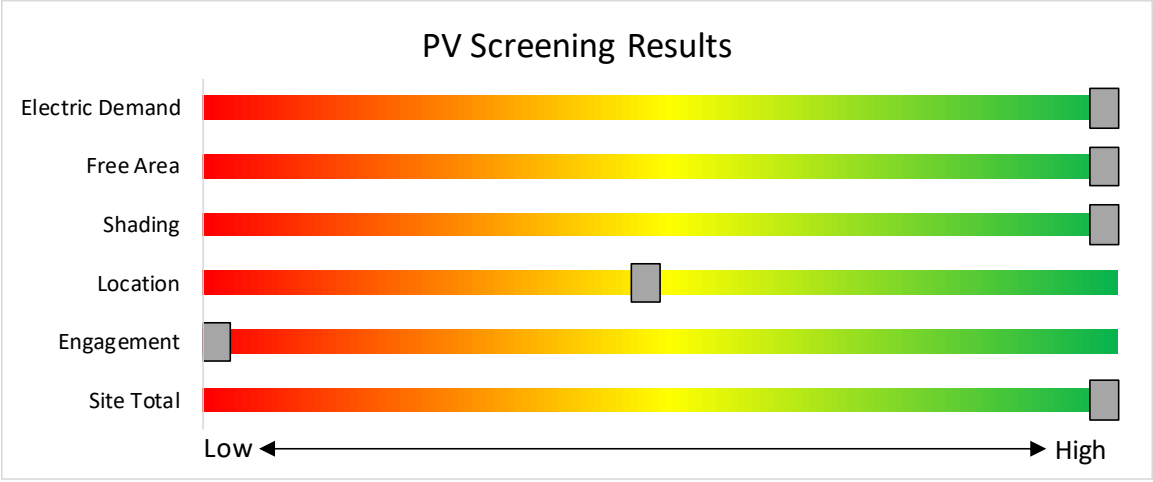
6.1 Solar Photovoltaic

Photovoltaic (PV) panels convert sunlight into electricity. Individual panels are combined into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is then connected to the building's electrical distribution system.

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has **high potential** for installing a PV array.

The amount of free area and the lack of shading elements contribute to the high potential. A PV array located on the roof and/or over the parking lot may be feasible. If you are interested in pursuing the installation of PV, we recommend conducting a full feasibility study.

The graphic below displays the results of the PV potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	High	
System Potential	550	kW DC STC
Electric Generation	655,254	kWh/yr
Displaced Cost	$105,720	/yr
Installed Cost	$2,145,000	

Figure 10 - Photovoltaic Screening

Solar Renewable Energy Certificate (SREC) Registration Program (SRP)

Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SREC Registration Program before starting construction. Once your PV system is up and running, you periodically earn credits, which can then be sold on the open market for up to 15 years.

If you are considering installing solar photovoltaics on your building, visit www.njcleanenergy.com/srec for more information about the SREC Registration Program.

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

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

6.2 Combined Heat and Power

Combined heat and power (CHP) generates electricity at the facility and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

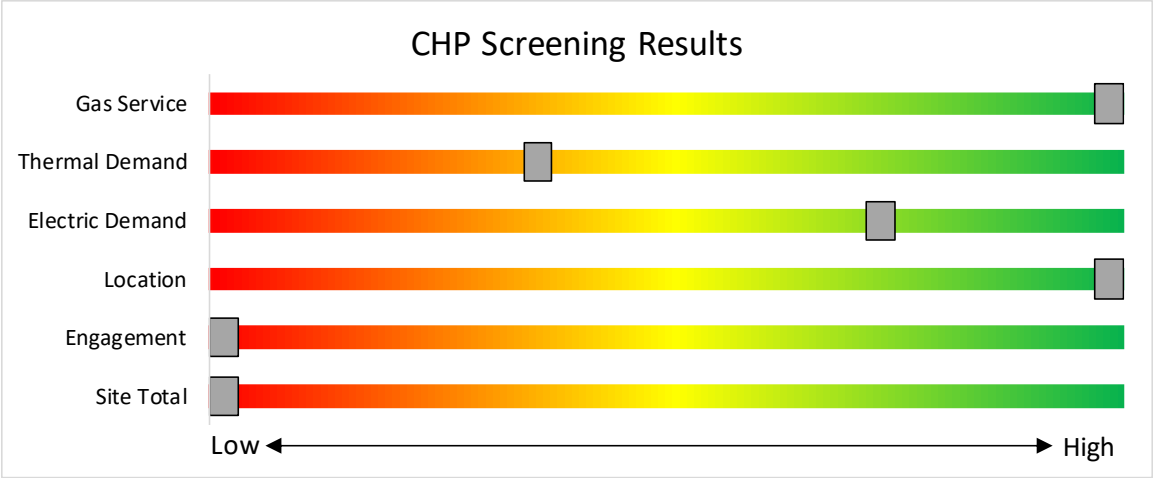
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for space cooling.

The key criteria used for screening is the amount of time that the CHP system would operate at full load and the facility's ability to use the recovered heat. Facilities with a continuous need for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has **no potential** for installing a cost-effective CHP system.

Based on a preliminary analysis, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation. The low or infrequent thermal load and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

The graphic below displays the results of the CHP potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	None	
System Type	None	
System Potential	90	kW
Electric Generation	658,626	kWh/yr
Thermal Generation	3,851,192	MBtu/yr
Displaced Cost	$62,032	/yr
Installed Cost	$345,000	

Figure 11 - Combined Heat and Power Screening

Find a qualified firm that specializes in commercial CHP cost assessment and installation: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.

7 Project Funding and Incentives

Ready to improve your building's performance? New Jersey's Clean Energy Programs can help. Pick the program that works best for you. Incentive programs that may apply to this facility are identified in the Executive Summary. This section provides an overview of currently available from New Jersey's Clean Energy Programs.

	SmartStart *Flexibility to install at your own pace*	**Direct Install** *Turnkey installation*	**Pay for Performance** *Whole building upgrades*
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.
Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.			

7.1 SmartStart

SmartStart offers incentives for installing prescriptive and custom energy efficiency measures at your facility. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades. This program serves most common equipment types and sizes.

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy-efficient equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers
Electric Unitary HVAC
Gas Cooling
Gas Heating
Gas Water Heating
Ground Source Heat Pumps
Lighting
Lighting Controls
Refrigeration Doors
Refrigeration Controls
Refrigerator/Freezer Motors
Food Service Equipment
Variable Frequency Drives

Incentives

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

7.2 Direct Install

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

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

How to Participate

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

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

7.3 Pay for Performance - Existing Buildings

Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15% source energy savings, and lighting cannot make up the majority of the savings. P4P is a generally a good option for medium-to-large sized facilities looking to implement as many measures as possible under a single project to achieve deep energy savings. This program has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program.

Incentives

Incentives are based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

Contact one of the pre-approved consultants and contractors ("Partners"). Under direct contract to you, they will help further evaluate the measures identified in this report through development of the energy reduction plan), assist you in implementing selected measures, and verify actual savings one year after the installation. Your Partner will also help you apply for incentives.

Approval of the final scope of work is required by the program prior to installation. Installation can be done by the contractor of your choice (some P4P Partners are also contractors) or by internal staff, but the Partner remains involved throughout construction to ensure compliance with the program requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: www.njcleanenergy.com/P4P.

7.4 Combined Heat and Power

The Combined Heat & Power (CHP) program provides incentives for eligible CHP or waste heat to power (WHP) projects. Eligible CHP or WHP projects must achieve an annual system efficiency of at least 65% (lower heating value, or LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

Incentives

Eligible Technologies	Size (Installed Rated Capacity)[1]	Incentive ($/kW)	% of Total Cost Cap per Project[3]	$ Cap per Project[3]
Powered by non-renewable or renewable fuel source[4]	≤500 kW	$2,000	30-40%[2]	$2 million
Gas Internal Combustion Engine	>500 kW - 1 MW	$1,000		
Gas Combustion Turbine	> 1 MW - 3 MW	$550	30%	$3 million
Microturbine Fuel Cells with Heat Recovery	>3 MW	$350		
Waste Heat to Power*	<1 MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

*Waste Heat to Power: Powered by non-renewable fuel source, heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine).

Check the NJCEP website for details on program availability, current incentive levels, and requirements.

How to Participate

You work with a qualified developer or consulting firm to complete the CHP application. Once the application is approved the project can be installed. Information about the CHP program can be found at: www.njcleanenergy.com/CHP.

7.5 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive for the life of the contract.

ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs described above can also be used to help further reduce the total project cost of eligible measures.

How to Participate

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

(1) Use an energy services company or "ESCO."

(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.

(3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

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

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

ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you can use NJCEP incentive programs to help further reduce costs when developing the energy savings plan. Refer to the ESIP guidelines at the link above for further information and guidance on next steps.

7.6 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number, which enables it to generate New Jersey SRECs. SRECs are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

Each time a solar installation generates 1,000 kilowatt-hours (kWh) of electricity, an SREC is earned. Solar project owners report the energy production to the SREC Tracking System. This reporting allows SRECs to be placed in the customer's electronic account. SRECs can then be sold on the SREC Tracking System, providing revenue for the first 15 years of the project's life.

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar Renewable Portfolio Standard. Purchasing SRECs can help them meet those requirements. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period fluctuates depending on supply and demand.

Information about the SRP can be found at: www.njcleanenergy.com/srec.

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

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

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third-party electric suppliers. If your facility already buys electricity from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party electric suppliers is available at the NJBPU website[8].

8.2 Retail Natural Gas Supply Options

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

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

If your facility does not already purchase natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility already purchases natural gas from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party natural gas suppliers is available at the NJBPU website[9].

[8] www.state.nj.us/bpu/commercial/shopping.html.

[9] www.state.nj.us/bpu/commercial/shopping.html.

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Wall Pack	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		120	4,380		None	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	120	4,380	0.0	0	0	$0	$0	$0	0.0
Wall Pack	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		135	4,380		None	No	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	135	4,380	0.0	0	0	$0	$0	$0	0.0
Wall Pack	23	Compact Fluorescent: (1) 42W Plug-In Lamp	Timeclock		42	4,380	3	Relamp	No	23	LED Lamps: (1) 18.5W Plug-In Lamp	Timeclock	19	4,380	0.0	2,367	0	$382	$288	$0	0.8
Wall Pack	6	Metal Halide: (1) 250W Lamp	Timeclock		295	4,380	1	Fixture Replacement	No	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	89	4,380	0.0	5,427	0	$876	$5,796	$0	6.6
Recessed	18	Metal Halide: (1) 50W Lamp	Timeclock		72	4,380	1	Fixture Replacement	No	18	LED - Fixtures: Downlight Recessed	Timeclock	22	4,380	0.0	3,974	0	$641	$2,732	$0	4.3
Mechanical Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.1	218	0	$35	$146	$0	4.2
Wall Pack	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell		120	4,380		None	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	120	4,380	0.0	0	0	$0	$0	$0	0.0
Wall Pack	1	Metal Halide: (1) 150W Lamp	Photocell		190	4,380	1	Fixture Replacement	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	57	4,380	0.0	583	0	$94	$966	$0	10.3
Mechanical Room 2	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.2	490	0	$78	$329	$0	4.2
Mechanical Room 2	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
electric Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.1	218	0	$35	$146	$0	4.2
electric Room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Pole Lights	7	Metal Halide: (1) 250W Lamp	Timeclock		295	4,380	1	Fixture Replacement	No	7	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	89	4,380	0.0	6,331	0	$1,021	$8,362	$0	8.2
Cafeteria	37	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	37	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	1.1	6,392	-1	$1,014	$1,891	$0	1.9
Cafeteria	23	LED Lamps: (1) 10.5W Plug-In Lamp	Wall Switch	s	11	3,740	5	None	Yes	23	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	2,581	0.1	308	0	$49	$540	$0	11.1
Cafeteria	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Kitchen	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.7	4,146	-1	$658	$1,146	$0	1.7
Kitchen	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	54	0	$9	$37	$0	4.2
Kitchen Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.1	518	0	$82	$380	$0	4.6
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,740	0.0	136	0	$22	$37	$0	1.7
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	139	0	$22	$343	$0	15.6
Janitorial	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	54	0	$9	$37	$0	4.2
K wing Hallway	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.1	518	0	$82	$335	$0	4.1
K wing Hallway	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Womens Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,740	0.0	136	0	$22	$37	$0	1.7
Mens Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,740	0.0	136	0	$22	$37	$0	1.7
Boys Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	345	0	$55	$343	$0	6.3
Boys Restroom	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3, 5	Relamp	Yes	1	LED Lamps: (2) 18.5W Plug-In Lamps	Occupancy Sensor	37	2,581	0.0	109	0	$17	$25	$0	1.4
Girls Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	345	0	$55	$343	$0	6.3
Girls Restroom	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3, 5	Relamp	Yes	1	LED Lamps: (2) 18.5W Plug-In Lamps	Occupancy Sensor	37	2,581	0.0	109	0	$17	$25	$0	1.4
A wing Hallway	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.2	1,382	0	$219	$742	$0	3.4
A wing Hallway	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 55	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,348	-1	$531	$1,073	$0	2.0
Room 53	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Hallway	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.1	518	0	$82	$335	$0	4.1
Room 50	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.2	1,217	0	$193	$562	$0	2.9
Room 57	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,740	0.0	230	0	$37	$73	$0	2.0
Room 52	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.3	1,555	0	$247	$599	$0	2.4
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	54	0	$9	$37	$0	4.2
Room 48	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	54	0	$9	$37	$0	4.2
Thinking Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	345	0	$55	$343	$0	6.3
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.1	345	0	$55	$73	$0	1.3
Room 42	24	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	24	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	1.1	6,219	-1	$986	$1,855	$0	1.9
Room 46	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.2	864	0	$137	$453	$0	3.3
Room 46	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Maintenance Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	518	0	$82	$380	$0	4.6
Security Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,740	0.0	136	0	$22	$37	$0	1.7
Room 43	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.2	1,382	0	$219	$562	$0	2.6

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
AHU Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.1	163	0	$26	$110	$0	4.2
Kids Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.2	1,036	0	$164	$489	$0	3.0
Kids Room	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3	Relamp	No	1	LED Lamps: (2) 18.5W Plug-In Lamps	Wall Switch	37	3,740	0.0	62	0	$10	$25	$0	2.6
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,740	0.0	136	0	$22	$37	$0	1.7
Janitorial	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	54	0	$9	$37	$0	4.2
Supply Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	208	0	$33	$380	$0	11.5
Room 35	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
B wing Hallway	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.3	1,900	0	$301	$852	$0	2.8
B wing Hallway	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 32	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 32	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	181	0	$29	$37	$0	1.3
Room 35	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	181	0	$29	$307	$0	10.7
Room 33	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	181	0	$29	$37	$0	1.3
Room 33	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	139	0	$22	$343	$0	15.6
Room 30	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	181	0	$29	$37	$0	1.3
Room 30	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Electric Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	109	0	$17	$73	$0	4.2
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	139	0	$22	$343	$0	15.6
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.0	69	0	$11	$37	$0	3.3
Room 26	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.2	1,296	0	$206	$544	$0	2.6
Room 28	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	1,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,500	0.0	92	0	$15	$73	$0	5.0
Room 25, Girls Locker Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.2	1,382	0	$219	$562	$0	2.6
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	139	0	$22	$343	$0	15.6

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	345	0	$55	$343	$0	6.3
Offce	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.0	173	0	$27	$307	$0	11.2
Offce	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3, 5	Relamp	Yes	1	LED Lamps: (2) 18.5W Plug-In Lamps	Occupancy Sensor	37	2,581	0.0	109	0	$17	$25	$0	1.4
Cwing Hallway	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.3	1,555	0	$247	$779	$0	3.2
Cwing Hallway	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Library	44	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	44	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	2.3	13,392	-3	$2,124	$4,023	$0	1.9
Library	10	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3, 5	Relamp	Yes	10	LED Lamps: (2) 18.5W Plug-In Lamps	Occupancy Sensor	37	2,581	0.2	1,089	0	$173	$520	$0	3.0
Library	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	691	0	$110	$146	$0	1.3
Library	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Work Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.3	1,826	0	$290	$708	$0	2.4
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	1,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,500	0.0	92	0	$15	$73	$0	5.0
Restroom	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3	Relamp	No	1	LED Lamps: (2) 18.5W Plug-In Lamps	Wall Switch	37	3,740	0.0	62	0	$10	$25	$0	2.6
Book Storage	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.2	346	0	$55	$453	$0	8.2
Conference Room	8	Compact Fluorescent: One Lamp Screw-in	Wall Switch	s	23	3,740	3, 5	Relamp	Yes	8	LED Lamps: One Lamp Screw-in	Occupancy Sensor	16	2,581	0.1	391	0	$62	$408	$0	6.6
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	139	0	$22	$343	$0	15.6
Old Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.0	69	0	$11	$307	$0	27.9
Old Storage	1	Compact Fluorescent: One Lamp Screw-in	Wall Switch	s	23	1,500	3, 5	Relamp	Yes	1	LED Lamps: One Lamp Screw-in	Occupancy Sensor	16	1,035	0.0	20	0	$3	$17	$0	5.5
Old Storage Wall	1	LED Lamps: One Lamp Screw-in	Wall Switch		9	3,740		None	No	1	LED Lamps: One Lamp Screw-in	Wall Switch	9	3,740	0.0	0	0	$0	$0	$0	0.0
Old Food Warehouse	1	Metal Halide: (1) 150W Lamp	Wall Switch		190	3,740	1	Fixture Replacement	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	57	3,740	0.0	497	0	$80	$966	$0	12.0
Old Food Warehouse	8	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	s	158	3,740	2, 5	Relamp & Reballast	Yes	8	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,581	0.6	3,565	-1	$565	$1,300	$0	2.3
Old Food Warehouse	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.2	1,382	0	$219	$292	$0	1.3
Boys Locker Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.2	1,036	0	$164	$489	$0	3.0
Boys Locker Room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,740	0.0	136	0	$22	$37	$0	1.7
Restroom	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3, 5	Relamp	Yes	1	LED Lamps: (2) 18.5W Plug-In Lamps	Occupancy Sensor	37	2,581	0.0	109	0	$17	$295	$0	17.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.0	173	0	$27	$37	$0	1.3
Janitorial	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	s	22	1,500	3	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	1,500	0.0	22	0	$4	$16	$0	4.6
Room 15	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 15	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	181	0	$29	$37	$0	1.3
Supply Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.2	554	0	$88	$562	$0	6.4
Room 13	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.1	777	0	$123	$434	$0	3.5
Room 12	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 12	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	181	0	$29	$37	$0	1.3
1998 wing Hallway	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.4	2,073	0	$329	$888	$0	2.7
1998 wing Hallway	3	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3, 6	Relamp	Yes	3	LED Lamps: (2) 18.5W Plug-In Lamps	High/Low Control	37	2,581	0.1	327	0	$52	$300	$0	5.8
1998 wing Hallway	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Girls Restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	691	0	$110	$416	$0	3.8
Electric Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	109	0	$17	$73	$0	4.2
Boys Restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	691	0	$110	$416	$0	3.8
Elevator Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	54	0	$9	$37	$0	4.2
Room 7	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 7	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	181	0	$29	$37	$0	1.3
Room 5	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 5	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
Room 4	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.7	3,887	-1	$617	$1,092	$0	1.8
Storage Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	1,500	3, 5	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,035	0.2	488	0	$77	$562	$0	7.3
Room 2	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 3	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 3	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3
Room 1	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 1	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 2	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$380	$0	4.4
Stairwell	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.1	518	0	$82	$335	$0	4.1
Stairwell	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Music Hallway	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.3	1,555	0	$247	$779	$0	3.2
Music Hallway	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Electric Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	54	0	$9	$37	$0	4.2
Room 165	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.4	2,332	0	$370	$763	$0	2.1
Room 165	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	271	0	$43	$55	$0	1.3
Room 163	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.6	3,628	-1	$575	$1,037	$0	1.8
Room 163	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Music Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.1	777	0	$123	$434	$0	3.5
Room 163	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	181	0	$29	$307	$0	10.7
Room 163D	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,740	0.0	136	0	$22	$37	$0	1.7
Room 163C	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,740	0.0	136	0	$22	$37	$0	1.7
Room 163B	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,740	0.0	136	0	$22	$37	$0	1.7
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.1	345	0	$55	$298	$0	5.4
Hallway	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Music Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	139	0	$22	$343	$0	15.6
Mens Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,740	0.0	136	0	$22	$37	$0	1.7
Womens Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,740	0.0	136	0	$22	$37	$0	1.7
Girls Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	518	0	$82	$380	$0	4.6
Girls Restroom	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3, 5	Relamp	Yes	1	LED Lamps: (2) 18.5W Plug-In Lamps	Occupancy Sensor	37	2,581	0.0	109	0	$17	$25	$0	1.4
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	518	0	$82	$380	$0	4.6
Boys Restroom	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3, 5	Relamp	Yes	1	LED Lamps: (2) 18.5W Plug-In Lamps	Occupancy Sensor	37	2,581	0.0	109	0	$17	$25	$0	1.4

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Janitorial	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	54	0	$9	$37	$0	4.2
A wing 2nd Floor	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.2	1,036	0	$164	$444	$0	2.7
A wing 2nd Floor	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Backstage	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.4	2,073	0	$329	$708	$0	2.2
Stage	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.2	1,036	0	$164	$489	$0	3.0
Auditorium	5	Exit Signs: Fluorescent	None		16	8,760	4	Fixture Replacement	No	5	LED Exit Signs: 2 W Lamp	None	6	8,760	0.0	482	0	$76	$362	$0	4.7
Auditorium	40	Halogen Incandescent: One Lamp Screw-in	Wall Switch	s	90	3,740	3, 5	Relamp	Yes	40	LED Lamps: One Lamp Screw-in	Occupancy Sensor	14	2,581	2.3	13,278	-3	$2,106	$2,018	$0	1.0
Boot	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,581	0.1	323	0	$51	$415	$0	8.1
Boot	2	Compact Fluorescent: One Lamp Screw-in	Wall Switch	s	23	3,740	3, 5	Relamp	Yes	2	LED Lamps: One Lamp Screw-in	Occupancy Sensor	16	2,581	0.0	98	0	$16	$34	$0	2.2
Room 148	14	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.7	4,261	-1	$676	$1,292	$0	1.9
Room 148	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
Womens Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,740	0.0	230	0	$37	$73	$0	2.0
B wing 1st Floor	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	19	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.6	3,282	-1	$521	$1,594	$0	3.1
B wing 1st Floor	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Mens Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,740	0.0	230	0	$37	$73	$0	2.0
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,035	0.1	244	0	$39	$416	$0	10.7
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,035	0.1	244	0	$39	$146	$0	3.8
Room 135	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 135	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	181	0	$29	$37	$0	1.3
Room 132	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 132	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	181	0	$29	$37	$0	1.3
Room 133	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Main entrance	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	518	0	$82	$380	$0	4.6
Main entrance	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 130	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 130	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.0	259	0	$41	$55	$0	1.3
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.1	609	0	$97	$416	$0	4.3
Restroom	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3	Relamp	No	1	LED Lamps: (2) 18.5W Plug-In Lamps	Wall Switch	37	3,740	0.0	62	0	$10	$25	$0	2.6
Room 128	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 128	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
Room 126	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.2	864	0	$137	$453	$0	3.3
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,740	0.0	204	0	$32	$55	$0	1.7
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.2	1,217	0	$193	$562	$0	2.9
Principal Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.3	1,826	0	$290	$708	$0	2.4
Conference Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.1	609	0	$97	$416	$0	4.3
Restroom	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3	Relamp	No	1	LED Lamps: (2) 18.5W Plug-In Lamps	Wall Switch	37	3,740	0.0	62	0	$10	$25	$0	2.6
Closet 1	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	s	22	1,500	3	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	1,500	0.0	22	0	$4	$16	$0	4.6
Closet 2	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	1,500	3	Relamp	No	1	LED Lamps: (2) 18.5W Plug-In Lamps	Wall Switch	37	1,500	0.0	25	0	$4	$25	$0	6.4
Closet 3	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	1,500	3	Relamp	No	1	LED Lamps: (2) 18.5W Plug-In Lamps	Wall Switch	37	1,500	0.0	25	0	$4	$25	$0	6.4
Closet 4	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	54	0	$9	$37	$0	4.2
Mens Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	345	0	$55	$343	$0	6.3
Guidence Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	518	0	$82	$380	$0	4.6
Restroom	1	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3	Relamp	No	1	LED Lamps: (2) 18.5W Plug-In Lamps	Wall Switch	37	3,740	0.0	62	0	$10	$25	$0	2.6
C wing 1st Floor	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.2	1,209	0	$192	$706	$0	3.7
C wing 1st Floor	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	s	22	1,500	3	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	1,500	0.0	22	0	$4	$16	$0	4.6
Gym	11	Metal Halide: (1) 400W Lamp	Wall Switch	s	458	3,740	1, 5	Fixture Replacement	Yes	11	LED - Fixtures: High-Bay	Occupancy Sensor	137	2,581	2.9	16,436	-3	$2,607	$10,944	$0	4.2
Gym	1	LED - Fixtures: High-Bay	Wall Switch	s	165	3,740	5	None	Yes	1	LED - Fixtures: High-Bay	Occupancy Sensor	165	2,581	0.0	210	0	$33	$220	$0	6.6
Gym	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Gym Foyer	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	691	0	$110	$416	$0	3.8
Gym Foyer	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stair Exit 19	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.1	345	0	$55	$298	$0	5.4
Stair Exit 19	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stair	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.1	345	0	$55	$298	$0	5.4
Stair	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Gym Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,035	0.1	208	0	$33	$380	$0	11.5
Room 115	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 115	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
Room 114	21	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	21	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	1.1	6,391	-1	$1,014	$2,074	$0	2.0
Room 114	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	1,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,500	0.0	92	0	$15	$73	$0	5.0
Room 112	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 112	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
1998 wing 1st Floor	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.4	2,073	0	$329	$888	$0	2.7
1998 wing 1st Floor	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
1998 wing 1st Floor	4	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3, 6	Relamp	Yes	4	LED Lamps: (2) 18.5W Plug-In Lamps	High/Low Control	37	2,581	0.1	436	0	$69	$325	$0	4.7
Server Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	54	0	$9	$37	$0	4.2
Janitorial	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	139	0	$22	$343	$0	15.6
Girls Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	518	0	$82	$380	$0	4.6
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	518	0	$82	$380	$0	4.6
Room 107	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 105	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Rom 105	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3
Room 107	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 104	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.7	3,887	-1	$617	$1,092	$0	1.8
Storage Room 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	139	0	$22	$343	$0	15.6
Storage Room 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	139	0	$22	$343	$0	15.6
Room 102	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 102	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3
Room 103	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 103	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3
Room 101	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 101	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3
Stair Exit 13	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.2	864	0	$137	$408	$0	3.0
1998 wing 2nd floor	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.3	1,727	0	$274	$815	$0	3.0
1998 wing 2nd floor	3	Compact Fluorescent: (2) 26W Plug-In Lamps	Wall Switch	s	52	3,740	3, 6	Relamp	Yes	3	LED Lamps: (2) 18.5W Plug-In Lamps	High/Low Control	37	2,581	0.1	327	0	$52	$300	$0	5.8
1998 wing 2nd floor	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 201	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 201	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3
Room 203	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3
Room 203	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 202	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 202	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3
Room 204	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.7	3,887	-1	$617	$1,092	$0	1.8
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,035	0.1	208	0	$33	$380	$0	11.5
Storage Room 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,035	0.1	208	0	$33	$380	$0	11.5
Room 205	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9
Room 205	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3
Room 207	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,581	0.5	3,109	-1	$493	$927	$0	1.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 207	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	543	0	$86	$110	$0	1.3
Assistant Principal	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	518	0	$82	$380	$0	4.6
Girls Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	518	0	$82	$380	$0	4.6
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,581	0.1	518	0	$82	$380	$0	4.6
Janitorial	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	54	0	$9	$37	$0	4.2
C wing 2nd Floor	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.2	1,382	0	$219	$742	$0	3.4
C wing 2nd Floor	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Gym Stairs	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.2	1,036	0	$164	$444	$0	2.7
Gym Stairs	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 212	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 212	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
Room 214	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.8	4,565	-1	$724	$1,365	$0	1.9
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,035	0.1	244	0	$39	$416	$0	10.7
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	1,500	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,500	0.0	82	0	$13	$55	$0	4.2
Room 215	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 215	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	271	0	$43	$55	$0	1.3
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,035	0.1	208	0	$33	$380	$0	11.5
Roof Access	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	1,500	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,500	0.0	29	0	$5	$18	$0	4.0
Guidence Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.1	609	0	$97	$416	$0	4.3
B wing 2nd Floor	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 6	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,581	0.2	1,176	0	$187	$912	$0	4.9
B wing 2nd Floor	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 228	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.8	4,565	-1	$724	$1,365	$0	1.9
Room 225	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 225	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
Room 227	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 227	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
Room 230	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 230	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
Main Stairs	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 6	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,581	0.1	452	0	$72	$316	$0	4.4
Main Stairs	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 233	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.8	4,565	-1	$724	$1,365	$0	1.9
Room 233	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	90	0	$14	$18	$0	1.3
Closet	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	1,500	3, 5	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,035	0.2	366	0	$58	$489	$0	8.4
Room 232	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.8	4,565	-1	$724	$1,365	$0	1.9
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,035	0.1	244	0	$39	$416	$0	10.7
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	139	0	$22	$343	$0	15.6
Room 235	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 235	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.0	181	0	$29	$37	$0	1.3
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.1	139	0	$22	$343	$0	15.6
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	1,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,500	0.0	92	0	$15	$73	$0	5.0
A wing 2nd Floor	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.2	864	0	$137	$408	$0	3.0
A wing 2nd Floor	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 248	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	s	114	3,740	3, 5	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,581	0.6	3,652	-1	$579	$1,146	$0	2.0
Room 248	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	s	32	3,740	3, 5	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,581	0.1	362	0	$57	$73	$0	1.3
Old Fan Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	1,500	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,500	0.0	109	0	$17	$73	$0	4.2
Stair Cafeteria	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	s	62	3,740	3, 6	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,581	0.1	518	0	$82	$335	$0	4.1
Stair Cafeteria	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	s	93	3,740	3, 6	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,581	0.1	518	0	$82	$110	$0	1.3
Stair Cafeteria	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

Motor Inventory & Recommendations

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	OAU-2 (2nd Floor)	1	Supply Fan	25.0	91.7%	No	b	3,391	7	No	93.6%	Yes	1	7.4	26,807	0	$4,325	$10,845	$0	2.5
Roof	OAU-2 (2nd Floor)	1	Return Fan	15.0	91.0%	No	b	3,391	7	No	93.0%	Yes	1	4.6	16,242	0	$2,620	$7,041	$0	2.7
Roof	AHU-4 (Gym)	1	Supply Fan	20.0	91.0%	No	b	3,391	7	No	93.0%	Yes	1	5.9	21,656	0	$3,494	$8,582	$0	2.5
Roof	AHU-4 (Gym)	1	Return Fan	15.0	91.0%	No	b	3,391	7	No	93.0%	Yes	1	4.6	16,242	0	$2,620	$7,041	$0	2.7
Roof	1998 Wing AHU	1	Supply Fan	10.0	91.7%	No	w	3,391	7	No	91.7%	Yes	1	2.9	10,345	0	$1,669	$5,152	$0	3.1
Roof	OAU-1 (3rd floor)	1	Supply Fan	25.0	91.7%	No	b	3,391	7	No	93.6%	Yes	1	7.4	26,807	0	$4,325	$10,845	$0	2.5
Roof	OAU-1 (3rd floor)	1	Return Fan	10.0	91.0%	No	b	3,391	7	No	91.7%	Yes	1	3.0	10,568	0	$1,705	$5,152	$0	3.0
Roof	AHU-3 (Auditorium)	1	Supply Fan	15.0	91.0%	No	b	3,391	7	No	93.0%	Yes	1	4.4	16,242	0	$2,620	$7,041	$0	2.7
Roof	AHU-3 (Auditorium)	1	Return Fan	15.0	91.0%	No	b	3,391	7	No	93.0%	Yes	1	4.6	16,242	0	$2,620	$7,041	$0	2.7
Roof	AHU-2 (Music Room)	1	Supply Fan	10.0	89.5%	Yes	w	3,391		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	AHU-2 (Music Room)	1	Return Fan	7.5	88.5%	Yes	w	3,391		No	88.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	AHU-1 (Cafeteria)	1	Supply Fan	20.0	91.0%	No	b	3,391	7	No	93.0%	Yes	1	5.9	21,656	0	$3,494	$8,582	$0	2.5
Roof	AHU-1 (Cafeteria)	1	Return Fan	10.0	89.5%	No	b	3,391	7	No	91.7%	Yes	1	3.1	11,057	0	$1,784	$5,152	$0	2.9
Roof	Kitchen (EF-9)	1	Kitchen Hood Exhaust Fan	2.0	86.5%	No	w	5,250		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Kitchen (EF-6)	2	Kitchen Hood Exhaust Fan	0.3	73.4%	No	w	5,250		No	73.4%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Kitchen (MAU-1)	1	Supply Fan	1.5	84.0%	No	b	2,745		No	84.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	1998 wing DHW	1	Heating Hot Water Pump	0.2	69.5%	No	w	2,745		No	69.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	1998 wing HHW	1	Combustion Air Fan	0.5	78.2%	No	w	2,745		No	78.2%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	1998 wing HHW	2	Heating Hot Water Pump	2.0	84.0%	No	b	2,745	9	No	86.5%	Yes	2	0.4	3,847	0	$621	$28,353	$0	45.7
Mechanical Room	1998 wing CHW	1	Chilled Water Pump	7.5	91.0%	No	w	3,391	8	No	91.0%	Yes	1	1.4	7,818	0	$1,261	$19,165	$0	15.2

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Room	1998 wing CHW	1	Chilled Water Pump	7.5	88.5%	No	b	3,391	8	No	91.0%	Yes	1	1.5	8,437	0	$1,361	$19,165	$0	14.1
Mechanical Room	Entire School (except 1998 wing) HHW	3	Heating Hot Water Pump	1.0	82.5%	No	w	2,745		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	Entire School (except 1998 wing) DHW	2	Heating Hot Water Pump	0.3	62.5%	No	w	2,745		No	62.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	Entire School (except 1998 wing) HHW	2	Heating Hot Water Pump	20.0	93.6%	Yes	b	3,391		No	93.6%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	CHW	2	Chilled Water Pump	7.5	91.7%	No	w	3,391		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	CHW	2	Chilled Water Pump	25.0	94.1%	Yes	w	4,067		No	94.1%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	AHU 7	1	Supply Fan	5.0	87.5%	No	w	2,745	7	No	89.5%	Yes	1	1.5	4,565	0	$736	$4,076	$0	5.5
Mechanical Room	AHU 5	1	Supply Fan	10.0	89.5%	No	w	3,391	7	No	91.7%	Yes	1	3.0	11,057	0	$1,784	$5,152	$0	2.9
Mechanical Room	AHU5	1	Return Fan	5.0	87.5%	No	w	2,745	7	No	89.5%	Yes	1	1.5	4,565	0	$736	$4,076	$0	5.5
Elevator Room	Elevator	1	Other	20.0	91.0%	No	w	200		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0

Electric HVAC Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	AHU-9, 10, 12, 11	4	Ductless Mini-Split AC	3.00		b	10	Yes	4	Ductless Mini-Split AC	3.00		18.00		3.0	2,787	0	$450	$32,874	$0	73.1
Roof	Assistant Principal Office	1	Ductless Mini-Split HP	2.00	27.60	b	11	Yes	1	Ductless Mini-Split HP	2.00	27.60	18.00	3.80	0.5	712	0	$115	$4,798	$0	41.7
Roof	1998 Wing	1	Split-System AC	40.00		b	10	Yes	1	Split-System AC	40.00		11.50		3.9	3,609	0	$582	$44,006	$0	75.6

Electric Chiller Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Remaining Useful Life	ECM #	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/ Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Grond Floor Mechnical Area	Chilled Water Ssytem	2	Air-Cooled Screw Chiller	200.00	w		No							0.0	0	0	$0	$0	$0	0.0
Grond Floor Mechnical Area	Chilled Water Ssytem	1	Air-Cooled Screw Chiller	60.00	b	12	Yes	1	Air-Cooled Screw Chiller	Variable	60.00	1.24	0.74	13.1	9,143	0	$1,475	$59,084	$0	40.1

Fuel Heating Inventory & Recommendations

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	1998 Wing AHU	1	Furnace	710.00	b	14	Yes	1	Furnace	710.00	95.00%	AFUE	0.0	0	56	$730	$16,087	$800	20.9
Mechanical Room	1998 wing HHW	1	Non-Condensing Hot Water Boiler	278.00	b	13	Yes	1	Non-Condensing Hot Water Boiler	278.00	85.00%	AFUE	0.0	0	8	$102	$10,170	$800	91.9
Mechanical Room	Entire School HHW (except 1998 wing)	3	Non-Condensing Hot Water Boiler	######	b		No						0.0	0	0	$0	$0	$0	0.0

DHW Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Room	1998 Wing	1	Storage Tank Water Heater (> 50 Gal)	b	15	Yes	1	Storage Tank Water Heater (> 50 Gal)	Natural Gas	93.00%	Et	0.0	0	20	$255	$14,736	$1,785	50.8
Mechanical Room	Entire School (except wing 1998)	2	Boiler	w		No						0.0	0	0	$0	$0	$0	0.0

Walk-In Cooler/Freezer Inventory & Recommendations

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Stand-Up Refrigerator, Solid Door (>50 cu. ft.)	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	4	Refrigerator Chest	No		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Insulated Food Holding Cabinet (Full Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Rack Oven (Single)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	2	Gas Convection Oven (Full Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Steamer	Yes		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Kitchen	1	Washer/Dryer	2,500.0	
Multiple Locations	5	Refrigerator	600.0	
Multiple Locations	11	Microwave	1,000.0	
Multiple Locations	5	TV	120.0	
Multiple Locations	7	Minifridge	30.0	
Multiple Locations	2	Water Cooler	500.0	
Kitchen	1	Coffee Machine	400.0	
Multiple Locations	3	Dehumidifier	1,500.0	
Art Room	1	Kiln	9,948.0	
Multiple Locations	50	Desktop Computers	75.0	
Multiple Locations	750	Laptops	40.0	
Multiple Locations	25	Printer	20.0	

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

EUI is presented in terms of *site energy* and *source energy*. Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

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ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Veterans Memorial Intermediate School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 113,150
Built: 2007

For Year Ending: June 30, 2018
Date Generated: September 30, 2019

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Veterans Memorial Intermediate School 424 S. Main Road Vineland, New Jersey 08360	Vineland Public Schools 61 W. Landis Avenue Vineland, NJ 08360 856-794-6700, ext 2226	Gene Mercoli 61 W. Landis Avenue Vineland, NJ 08360 856-794-6700, ext. 2226 jrosado@trcsolutions.com

Property ID: 7566446

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
78.7 kBtu/ft²

Source EUI
163 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	3,706,476 (42%)
Electric - Grid (kBtu)	5,198,240 (58%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	53.1
National Median Source EUI (kBtu/ft²)	110
% Diff from National Median Source EUI	48%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	724

Signature & Stamp of Verifying Professional

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

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)

APPENDIX C: GLOSSARY

TERM	DEFINITION
Blended Rate	Used to calculate fiscal savings associated with measures. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour.
Btu	*British thermal unit*: a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit.
CHP	*Combined heat and power*. Also referred to as cogeneration.
COP	*Coefficient of performance*: a measure of efficiency in terms of useful energy delivered divided by total energy input.
Demand Response	Demand response reduces or shifts electricity usage at or among participating buildings/sites during peak energy use periods in response to time-based rates or other forms of financial incentives.
DCV	*Demand control ventilation*: a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
US DOE	*United States Department of Energy*
EC Motor	*Electronically commutated motor*
ECM	*Energy conservation measure*
EER	*Energy efficiency ratio*: a measure of efficiency in terms of cooling energy provided divided by electric input.
EUI	*Energy Use Intensity:* measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance.
Energy Efficiency	Reducing the amount of energy necessary to provide comfort and service to a building/area. Achieved through the installation of new equipment and/or optimizing the operation of energy use systems. Unlike conservation, which involves some reduction of service, energy efficiency provides energy reductions without sacrifice of service.
ENERGY STAR®	ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA.
EPA	*United States Environmental Protection Agency*
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
GHG	*Greenhouse gases:* gases that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.

gpf	*Gallons per flush*
gpm	*Gallon per minute*
HID	*High intensity discharge:* high-output lighting lamps such as high-pressure sodium, metal halide, and mercury vapor.
hp	*Horsepower*
HPS	*High-pressure sodium*: a type of HID lamp
HSPF	*Heating seasonal performance factor:* a measure of efficiency typically applied to heat pumps. Heating energy provided divided by seasonal energy input.
HVAC	*Heating, ventilating, and air conditioning*
IHP 2014	US DOE Integral Horsepower rule. The current ruling regarding required electric motor efficiency.
IPLV	*Integrated part load value:* a measure of the part load efficiency usually applied to chillers.
kBtu	One thousand British thermal units
kW	*Kilowatt*: equal to 1,000 Watts.
kWh	*Kilowatt-hour*: 1,000 Watts of power expended over one hour.
LED	*Light emitting diode*: a high-efficiency source of light with a long lamp life.
LGEA	*Local Government Energy Audit*
Load	The total power a building or system is using at any given time.
Measure	A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption.
MH	*Metal halide*: a type of HID lamp
MBh	*Thousand Btu per hour*
MBtu	*One thousand British thermal units*
MMBtu	*One million British thermal units*
MV	*Mercury Vapor:* a type of HID lamp
NJBPU	*New Jersey Board of Public Utilities*
NJCEP	*New Jersey's Clean Energy Program:* NJCEP is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money and the environment.
psig	Pounds per square inch gauge
Plug Load	Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug.

PV	*Photovoltaic:* refers to an electronic device capable of converting incident light directly into electricity (direct current).
SEER	*Seasonal energy efficiency ratio:* a measure of efficiency in terms of annual cooling energy provided divided by total electric input.
SEP	*Statement of energy performance:* a summary document from the ENERGY STAR® Portfolio Manager®.
Simple Payback	The amount of time needed to recoup the funds expended in an investment or to reach the break-even point between investment and savings.
SREC	*Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array.
T5, T8, T12	A reference to a linear lamp diameter. The number represents increments of 1/8th of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense®	The symbol for water efficiency. The WaterSense® program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.