Local Government Energy Audit Report

STEM Building/Forum

May 6, 2021

Prepared for:

The College of New Jersey
2000 Pennington Road
Ewing, NJ 08628

Prepared by:

TRC
900 Route 9 North
Woodbridge, NJ 07095

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 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 material and labor costs primarily on RS Means cost manuals as well as on our experience at similar facilities. This approach is based on standard cost estimating manuals and is vendor neutral. Cost estimates include material and labor pricing associated with one for one equipment replacements. Cost estimates do not include demolition or removal of hazardous waste. The actual implementation costs for energy savings projects are anticipated to be significantly higher based on the specific conditions at your site(s). We strongly recommend that you work with your design engineer or contractor to develop actual project costs for your specific scope of work for the installation of high efficiency equipment. We encourage you to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on selected products and installers. TRC and NJBPU do not guarantee cost estimates and shall in no event be held liable should actual installed costs vary from these material and labor 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.

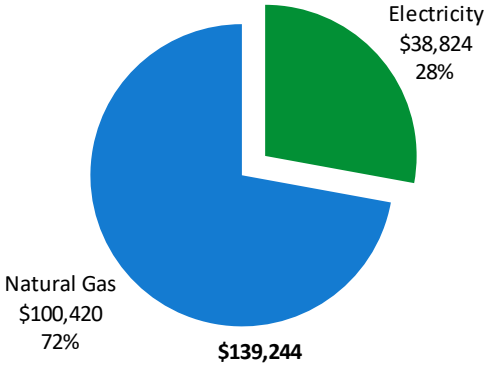
The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state, and federal requirements.

Table of Contents

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for STEM Building/Forum. 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: $139,244 Electricity: 1,362,794 kWh Natural Gas: 236,893 Therms	
ENERGY STAR® Benchmarking Score	N/A *(1-100 scale)*	A standard energy use benchmark is not available for this facility type. This report contains suggestions about how to improve building performance and reduce energy costs.

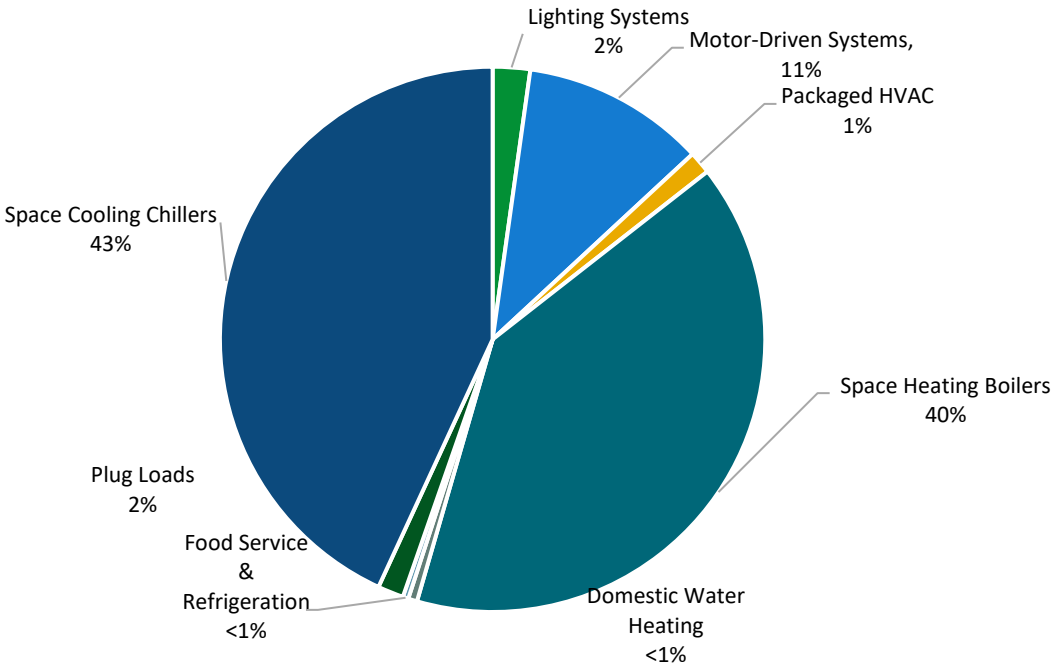


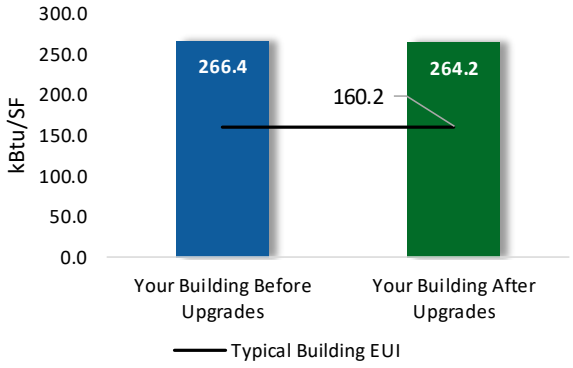
Figure 1 - Energy Use by System

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.

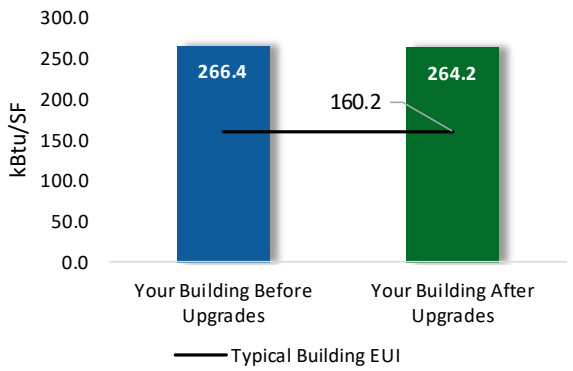
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$23,779
Potential Rebates & Incentives[1]	$6,262
Annual Cost Savings	$10,503
Annual Energy Savings	Electricity: 71,854 kWh Natural Gas: -161 Therms
Greenhouse Gas Emission Savings	35 Tons
Simple Payback	1.7 Years
Site Energy Savings (all utilities)	1%



Scenario 2: Cost Effective Package[2]

Installation Cost	$23,779
Potential Rebates & Incentives	$6,262
Annual Cost Savings	$10,503
Annual Energy Savings	Electricity: 71,854 kWh Natural Gas: -161 Therms
Greenhouse Gas Emission Savings	35 Tons
Simple Payback	1.7 Years
Site Energy Savings (all utilities)	1%



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 ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**71,854**	**10.1**	**-16**	**$10,503**	**$23,779**	**$6,262**	**$17,517**	**1.7**	**70,469**
ECM 1	Retrofit Fixtures with LED Lamps	Yes	71,854	10.1	-16	$10,503	$23,779	$6,262	$17,517	1.7	70,469
TOTALS (COST EFFECTIVE MEASURES)			**71,854**	**10.1**	**-16**	**$10,503**	**$23,779**	**$6,262**	**$17,517**	**1.7**	**70,469**
TOTALS (ALL MEASURES)			**71,854**	**10.1**	**-16**	**$10,503**	**$23,779**	**$6,262**	**$17,517**	**1.7**	**70,469**

* - 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	Retrofit Fixtures with LED Lamps	X		X

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.	Incentives are paid out in three installments. The first installment is meant to help offset the costs of the initial engineering study. The subsequent incentives are paid based on the level of energy savings up to 50% of the total project cost. See Section 7.3 for all incentive details.
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 percent 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 percent 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 STEM Building/Forum. 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

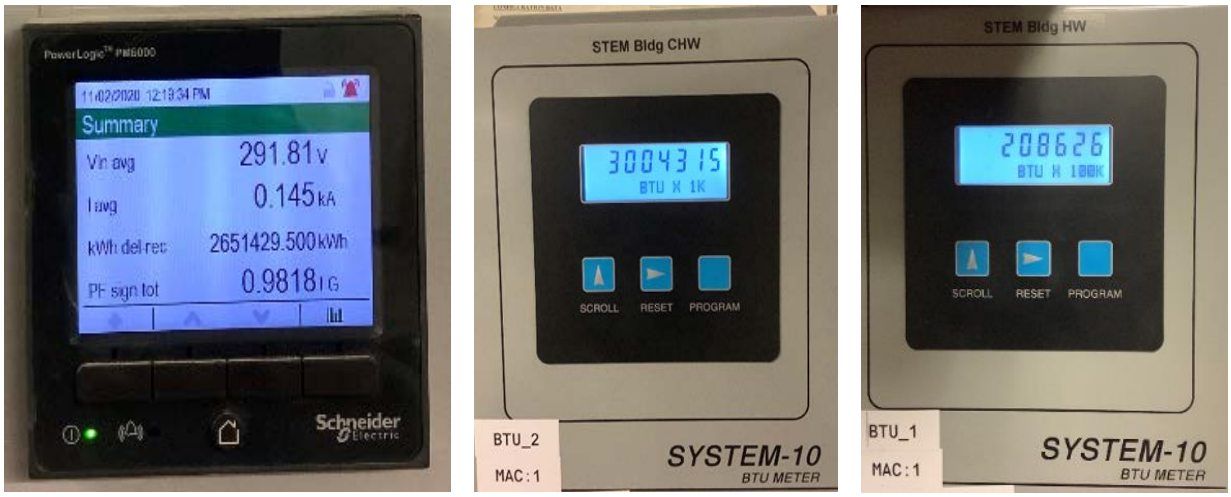
On November 2, 2020, TRC performed an energy audit at STEM Building/Forum located in Ewing, New Jersey. TRC met with Dan Oatman to review the facility operations and help focus our investigation on specific energy-using systems.

The STEM Building/Forum complex at TCNJ is a 3-story, 106,380 square foot building built in 2017. The building is home to the Departments of Biomedical Engineering and Mechanical Engineering, as well as the school of Science's Department of Computer Science. Spaces include classrooms, laboratories, administrative offices, corridors, bridgeways, stairs, café, restrooms, closets, storage rooms, electrical, and mechanical spaces.

Lighting is provided by a combination of LED fixtures and linear fluorescent T8 lamps. The facility uses steam and chilled water supplied from the Power House/Cogen building or Central Utilities Plant (CUP). There are two air handling units (AHUs), a make-up air unit (MAU) and energy recovery unit (ERU) equipped with hot water and chilled water coils that provide heating and cooling to spaces. There is a passenger elevator in the building. STEM Building/Forum is equipped with sub meters that track the cooling, heating, and electrical energy consumed by the building systems.

Because this is a relatively new building with highly efficient systems, only limited potential energy savings was projected as a result of this audit.

Aerial View - STEM/Forum



Electric, Chilled Water & Hot Water Sub Meters

2.2 Building Occupancy

The STEM/Forum building operates on a 12-month schedule. The weekend and summer occupancies vary, and the entire facility is shut down at approximately 10:00 PM. During a typical day, the facility is occupied by approximately 797 students and 71 staff. It should be noted that the energy and economic analysis for this building is based on the use of the building during the utility billing period, and that results will vary based on changes to building use patterns.

Building Name	Weekday/Weekend	Operating Schedule
STEM Building/Forum	Weekday	6:00 AM - 10:00 PM
	Weekend	Varies
	Summer	Varies

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are made of concrete block over structural steel with brick veneer façade. The main center flat roof is supported with steel trusses and a metal deck and finished with a thermoplastic white membrane. The center flat roof is surrounded with perimeter clay tile pitched roofing. The roofing systems are in good condition. The Forum building houses a café and a small kitchen which is made of concrete block with glass panel facades.

The windows are double glazed and have aluminum frames with a fiberglass thermal break. The glass-to-frame seals are in good condition. The fixed window weather seals are in good condition, showing no signs of outside air infiltration. The entrance doors are fully glazed with aluminum frames. The exit doors are made of metal frames and are in good condition. Overall, the building envelope appears in good condition.

STEM Building

Forum

Flat Roof & Bridgeway Connecting STEM Building to Forum

Entrance & Exit Doors


Windows

2.4 Lighting Systems

The primary interior lighting system is provided by both LED fixtures and 32-Watt linear fluorescent T8 lamps that use electronic ballasts. Fixture types include 2-lamp, 4-foot long troffer, recessed, pendant and surface mounted fixtures. The corridors, common areas, café, restrooms, stairs, Rooms 108, 111, 218 and the bridgeway are primarily lit with LED fixtures. Areas including mechanical and electrical spaces, Rooms 101, 103, 105 - 108, 111A, 112, 217, 222, 233, 235, 240, 241, and other small rooms are illuminated with 32-Watt linear fluorescent T8 sources. All light fixtures are in good condition. Exit signs throughout the building are LED fixtures. Interior lighting levels were generally sufficient. Light fixtures in spaces are controlled by both manual wall mounted switches and occupancy sensors that are either ceiling or wall mounted.

Exterior fixtures include nine 30-Watt LED lamps, all situated in pole mounted walkway fixtures. There are several roof and wall mounted fixtures containing compact fluorescent lamps. Exterior fixtures are controlled by a timeclock.

Occupancy Sensors & Wall Switches

LED & Linear T8

LED Fixtures & Linear T8

Pendant LED Fixtures - Room 111


Circular LED Fixtures & Exit Sign - Forum (Cafe)

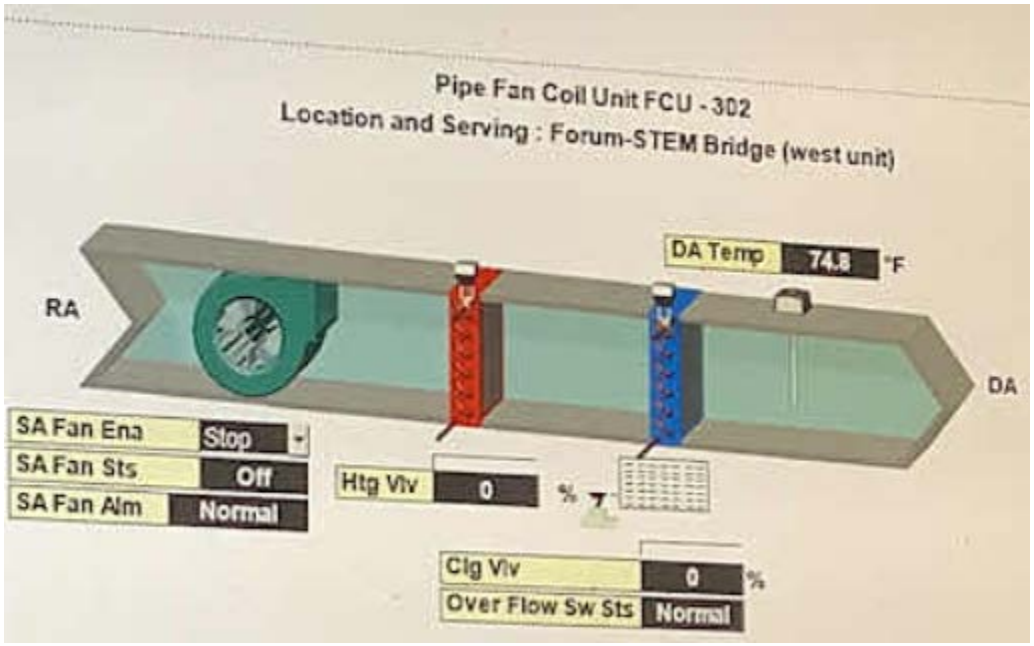


Pole Mounted LED Corn Bulb, Wall Mounted CFLs & Timeclock

2.5 Air Handling Systems

Fan Coil Units

Building spaces including corridors, bridgeways, and the main electrical room are air conditioned using fan coil units that are equipped with supply fan motors and digitally controlled fan coil valves. They provide heating and cooling. Hot water is generated from the central plant steam system via heat exchanger while the chilled water is piped directly from the central chilled water plant.



Fan Coils EMS View

Unitary Electric HVAC Equipment

Several building areas, including the server, telecommunication, and elevator rooms are cooled with Daikin ductless split system air conditioning units (AC). The units use a direct expansion cooling system, each with a 1.5-ton cooling capacity.

The units serving Rooms 201 and 202 are split system air source heat pumps, each with a cooling capacity of 1.5 tons and a heating capacity of 18 MBh. The ductless split AC and heat pumps are all controlled via programmable thermostats.

Ductless Split AC

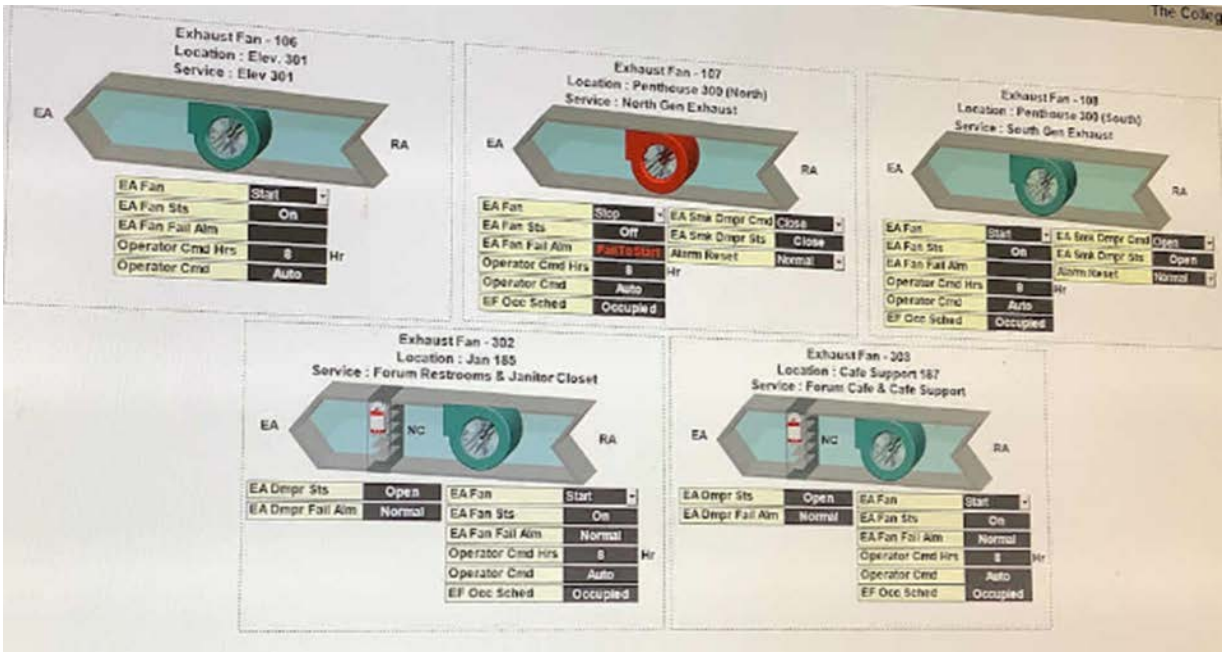
Programmable Thermostats

General Building Exhaust Air System

There are various general exhaust fans and fume hoods which serve the restrooms, laboratories, elevator room, café, and other spaces. There are larger fume hoods and exhaust fans that include three 60 hp (EF-101A, B, C) and two 15 hp (102-A, B) physically located on the roof and are respectively tied to the energy recovery unit (ERU-100) and the make-up air unit (MAU-100). The exhaust fans are equipped with variable frequency drives and controlled via the building management system (EMS).

Exhaust Fans 101-A, B, C & 102-A, B

Exhaust Fan 107 (3 hp) & Variable Frequency Drives (VFDs)



Exhaust Fans EMS Diagram View

Air Handling Units (AHUs)

The building is conditioned by two large air handling units (AHU-101 and 102), one energy recovery unit (ERU-100) and one make-up air unit (MAU-100) all located in the Penthouse. There is a medium size AHU-301 located in Room 2-M1 (the Forum Penthouse) which serves the Forum. The AHUs are equipped with supply and return fans with motors that are controlled by variable speed drives.

AHU-101 and 102 serve offices, laboratories, mechanical shop, and support spaces. Each unit contains hydronic preheat coils, chilled water coils, hot water coils, two supply fan motors, and one return fan motor. They are scheduled to operate 24 hours a day, and the supply ductwork manifold on each floor is configured such that both units normally operate at the same time, in parallel. When one unit is shut down automatically due to a failure, the other unit will provide limited capacity to meet the system demand. The two AHUs are interlocked with ERU-100 exhaust fans.

MAU-100 serves the paint booth. It operates at 100 percent outdoor air capacity and contains a hydronic preheat reheat coils, chilled water coils, and a supply air fan. The unit is available to operate during occupied hours when needed and is off whenever exhaust fans 102A and B are shut down or fail to start.

Air distribution is provided to supply air registers by ducts concealed above the ceilings. Heated and cooled air is distributed through ducts to variable air volume (VAV) terminals concealed above the ceilings. The AHUs are controlled by the facility energy management system (EMS).

The building air distribution system setpoints are divided in two different areas: non critical and critical areas.

- Non-critical areas include offices, classrooms, computer labs, conference rooms, and common areas. The setpoints are as follows:

Summer Occupied Setpoint: 76°F,
Winter Occupied Setpoint: 70°F

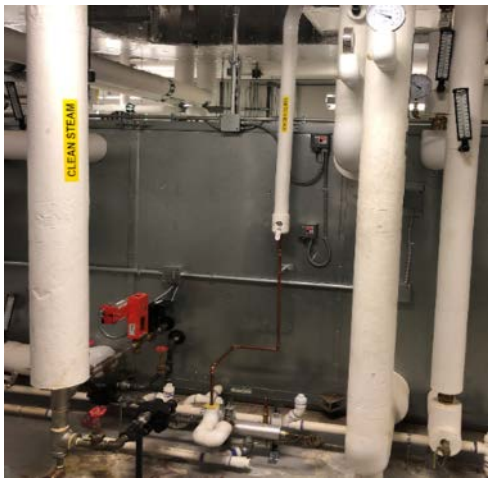
- Critical areas include laboratories, laboratory support spaces, and similar critical spaces. The setpoints are as follows:

Summer Occupied Setpoint: 72°F,
Winter Occupied Setpoint: 70°F

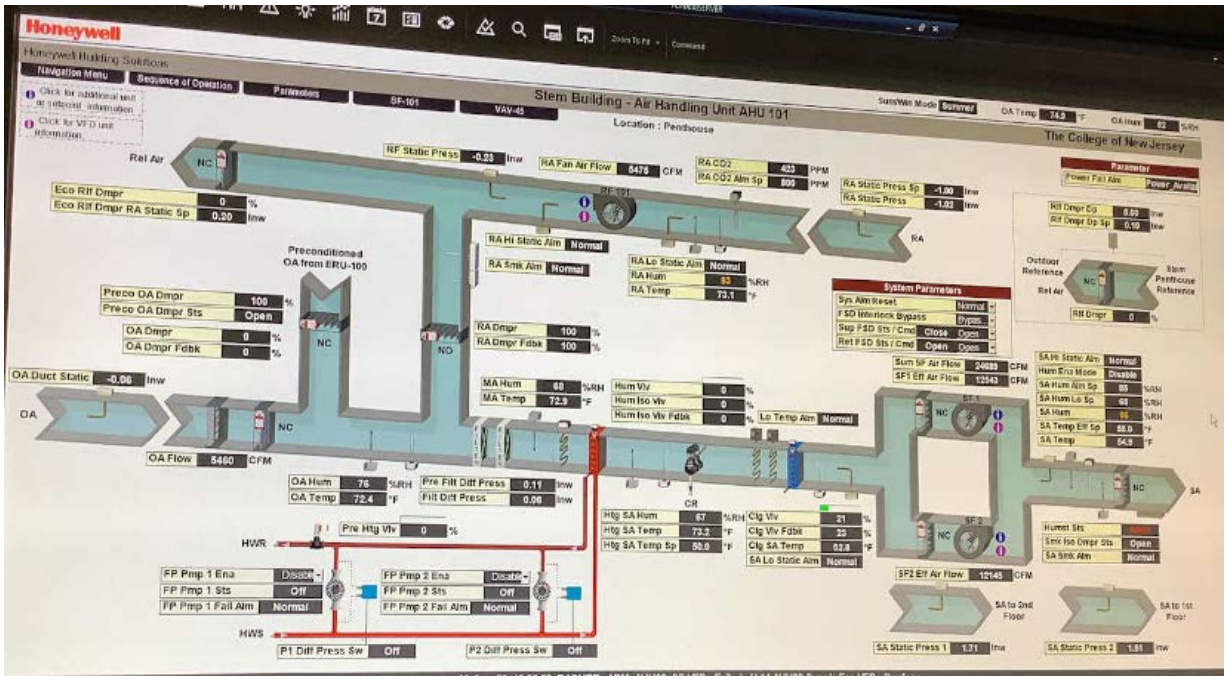
Summer switchover is enabled during months of April/May when the outside temperature is above 55°F for twelve hours or more. This sets all the VAVs terminals to maintain the summer setpoints until the winter switchover occurs.

The winter switchover is enabled during the months of November/December when the outside temperature is below 55°F for twelve hours or more. This sets all the VAVs terminals to maintain the winter setpoints until the next summer switchover occurs.

AHU-1 & VFDs



MAU-100



AHU-101 & EMS Diagram View

2.6 Steam System

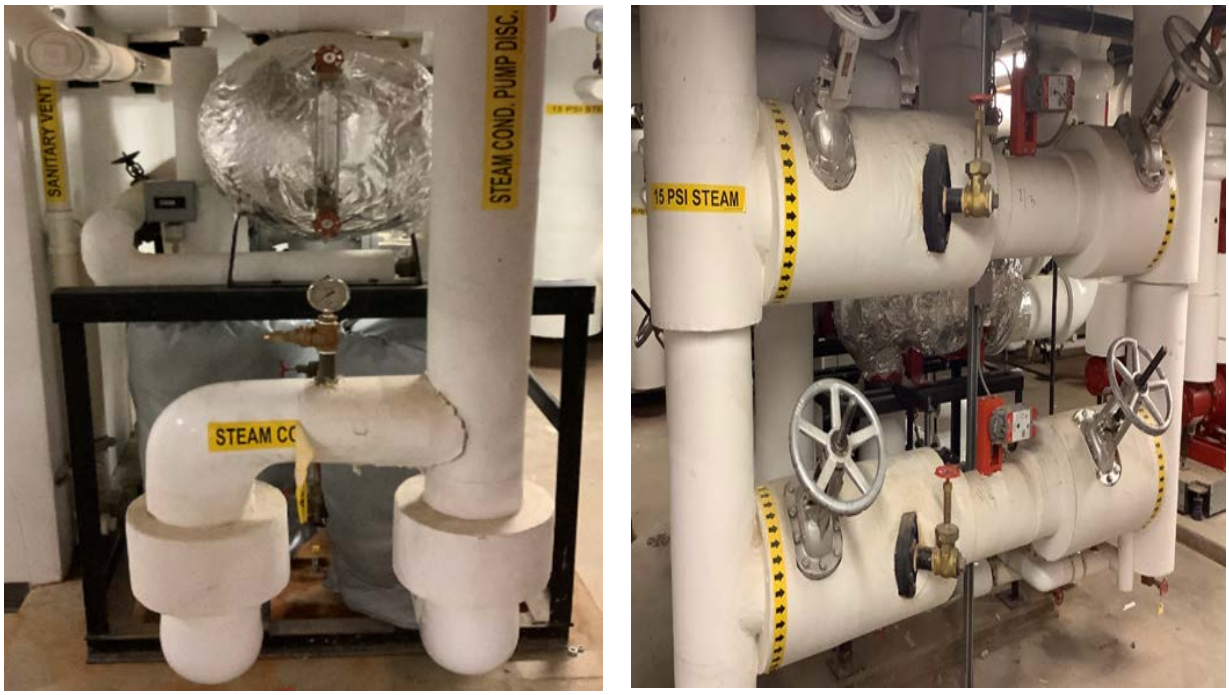
Steam is supplied by boilers and the cogeneration heat recovery system located in the Power House/Cogen Building. Steam is used in this building to produce space heating water and domestic hot water through steam heat exchangers.

There are two steam heat exchangers (HX-101 and 102) and each heat exchanger has two steam valves. The hot water system is designed such that one heat exchanger will operate at a time during hot water system operation. Duty heat exchanger rotation is performed automatically. There are two pressure induced condensate pumps.

Space heating water is circulated to AHU-101 and 102, MAU-100, fan coils, cabinet and hydronic unit heaters, and baseboards using two 25 hp variable flow main loop pumps (HWP 101 and HWP 102). Each AHU has two 1 hp dedicated constant flow hot water pumps while the MAU-100 has two dedicated 0.5 hp constant flow hot water pumps. The hot water distribution system is 2-pipe heating only. The hot water system is designed such that one main loop and dedicated hot water pump will operate at a time during hot water system operation. Pumps operate in a duty/standby arrangement.

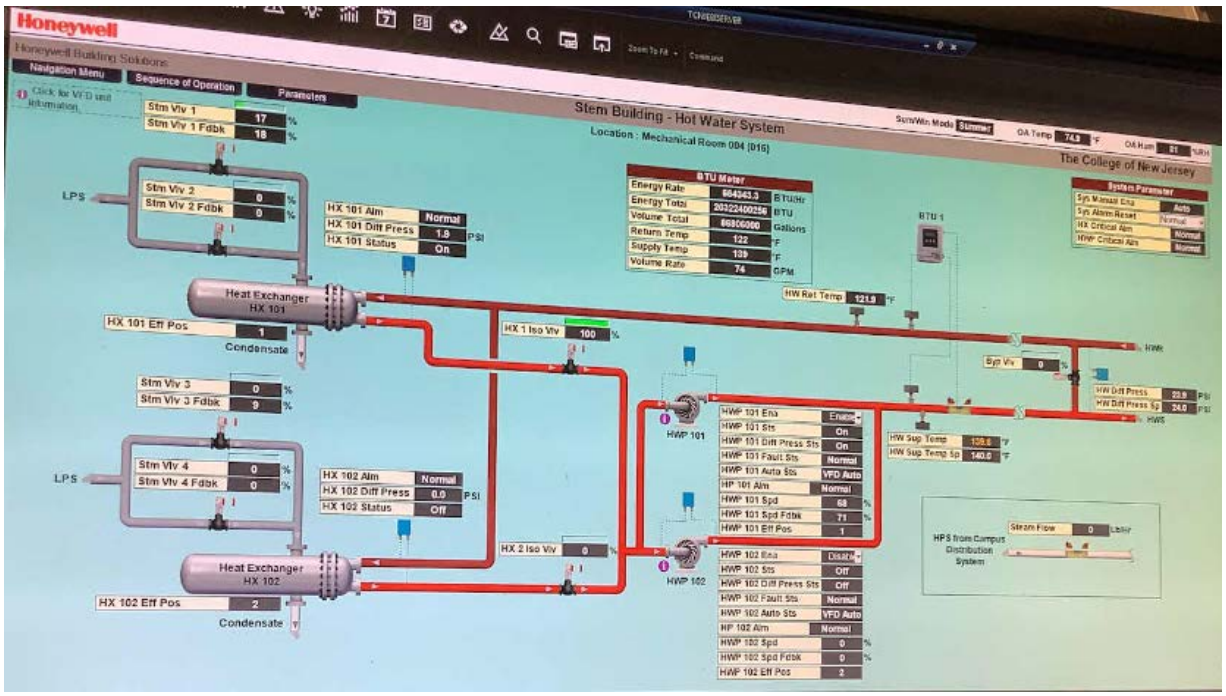
The hot water supply temperature is controlled to maintain 160°F when the outside temperature is below 60°F and this setpoint is reset to 180°F when the outside temperature is below 20°F. A flow transmitter and BTU meter are used to measure the hot water energy usage of the building.

Energy use associated with producing steam was allocated to individual buildings served by the cogeneration system and boilers. Please see the Power House/Cogen building report for details regarding the steam system.



Pressure Induce Condensate Pumps & Heat Exchangers

Hot Water Pumps & Variable Frequency Drive (VFD)



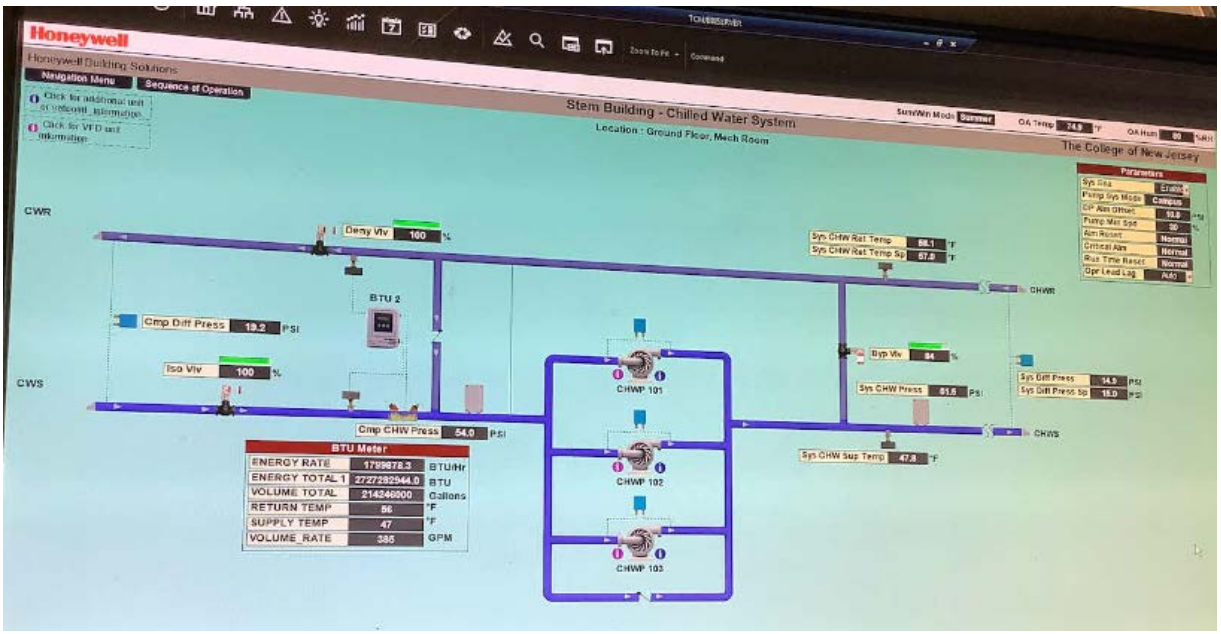
Hot Water EMS Diagram View

2.7 Chilled Water Systems

Chilled water is supplied by chillers located in the Power House/Cogen Building. Energy use associated with the steam engine and electric chillers used to produce chilled water was allocated to the individual buildings served by the chiller plant.

Chilled water is circulated to AHUs using three 25 hp variable flow pumps (CHWP-101, 102 and 103). They operate in a lead/lag/standby scheme with two pumps normally operating and one in standby. The chilled water system is designed to maintain the supply temperature at 47°F and the return leaving temperature at 57°F. A flow transmitter and BTU meter are used to measure the chilled water energy usage of the building. The chilled water distribution system is 2-pipe cooling only. Please see the Power House/Cogen Building report for details regarding the chiller plant.

Chilled Water Pumps & Variable Frequency Drive (VFD)



Chilled Water Diagram EMS View

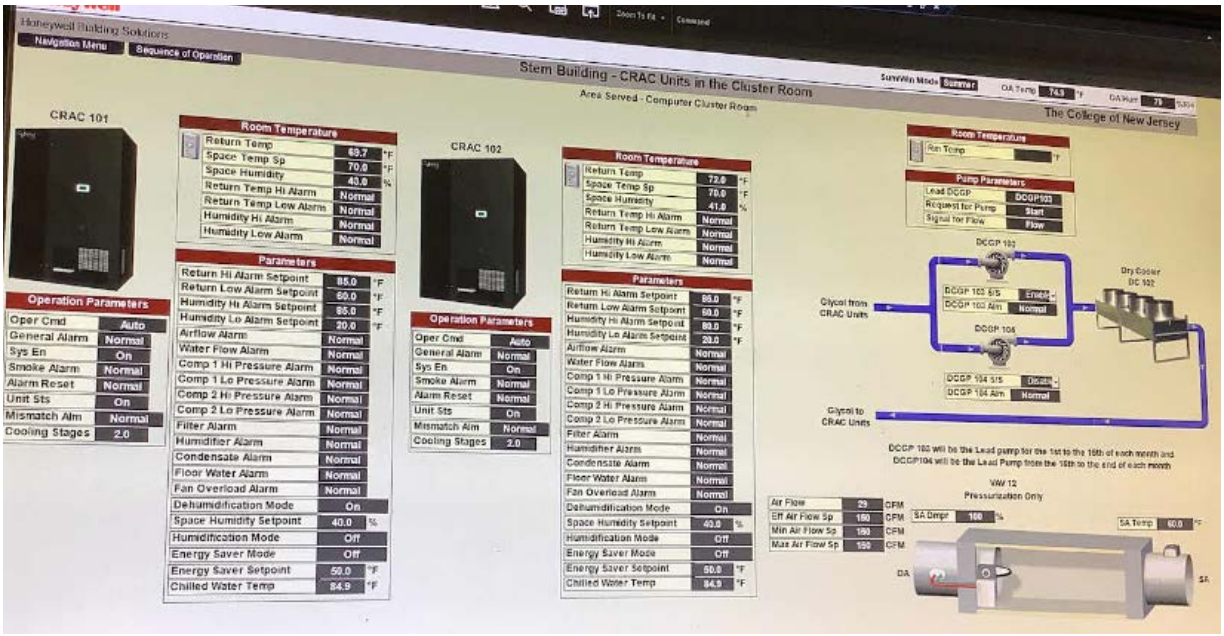
2.8 Process Cooling Water System

The data center (computer room) is air conditioned by two Colmac® fluid coolers that are multiple row compact finned tube coolers with direct drive fans. The fluid circulates in multiple passes through the tubes and cooling air flows over the exterior finned surface. They provide cooling of glycol/water in a closed loop system, eliminating the use of a cooling tower. The loop includes a heat exchanger (PHX-100), a mixing tank (CHWT-100), two 7.5 hp variable flow process cooling water pumps (PCWP-101 and 102) and two sets of two constant flow glycol pumps: 2 hp (DCGP-101 and 102) and 5 hp (DCGP-103 and 104).

The loop temperature is normally controlled by diverting chilled water return flow through the mixing tank. When the building chilled water loop is shut down during low ambient temperature conditions, the heat exchanger rejects heat from the process chilled water loop to a dry cooler loop using a glycol solution. The two process chilled water pumps (PCWP-101 and 102) operate at duty/standby mode. The mixing tank (CHWT-100) is monitored by the EMS via its temperature sensor. When the chilled water pump is active, the EMS modulates the chilled water mixing tank valve to maintain a tank temperature of 57°F. If the mixing tank temperature remains above 75°F for an adjustable time period initially set to 15 minutes, and the chilled water pump is inactive, the differential glycol pumps (DCGP) control will be activated and the heat exchanger (PHX-100) temperature control starts. The DCGP pumps operate in a lead/standby mode and at constant speed to meet the design flow and pressure requirements. During the winter mode, the heat exchanger valve will modulate to maintain the chilled water temperature at a setpoint of 75°F (adjustable).

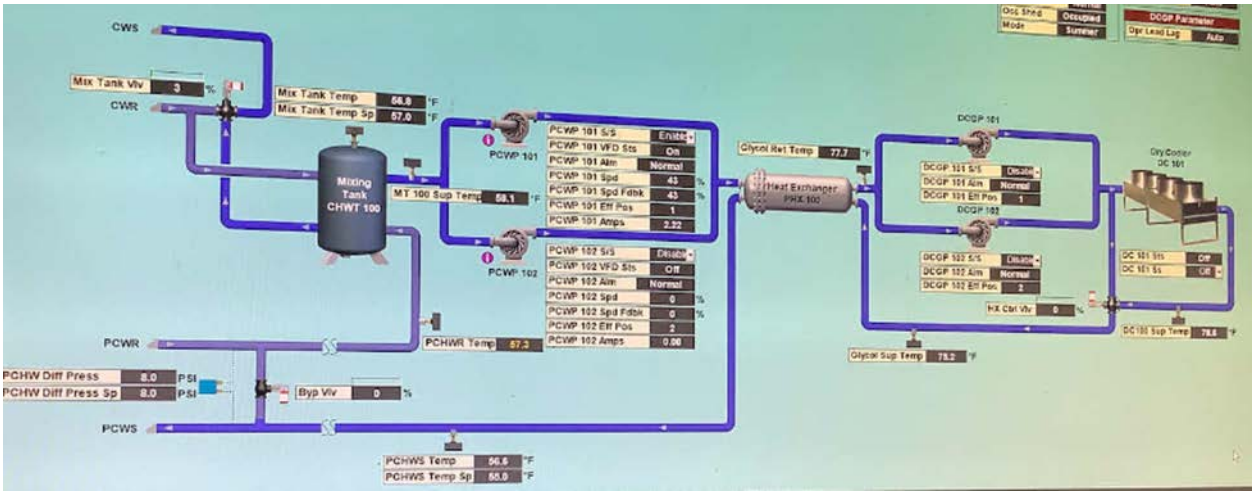
Each Colmac unit has a 10.68 ton cooling capacity and a heating capacity of 51.18 MBh. They are controlled with the building energy management system (EMS).

Colmac Fluid Cooler



Computer Room AC (Data Center) EMS View

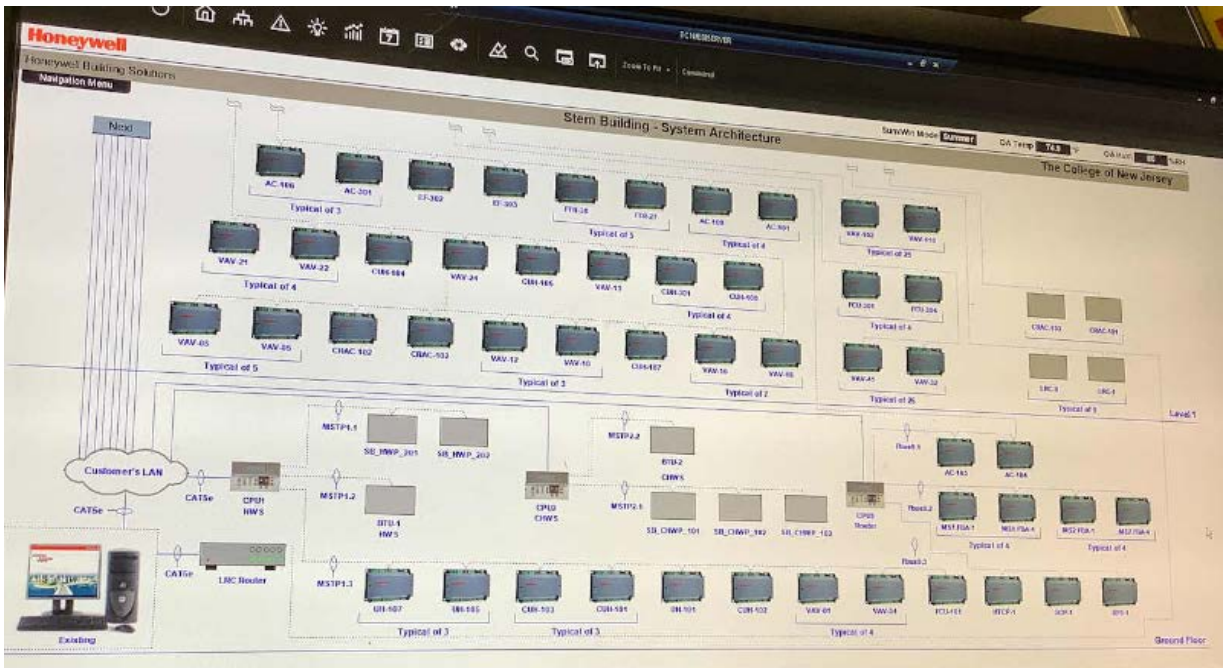
7.5 hp Process Cooling Water Pumps & Heat Exchanger



Process Cooling Water System EMS Diagram

2.9 Building Energy Management Systems (EMS)

A Honeywell EMS controls the HVAC equipment, boilers, chillers, and air handlers. The EMS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, humidity, heating water loop temperatures and chilled water loop temperatures.



Building Systems Architecture

2.10 Domestic Hot Water

Hot water is produced by four indirect-fired semi instantaneous (steam to water) water heaters using steam from the Power House/Cogeneration as the heating medium. They are constructed of stainless-steel pipe and other non-ferrous materials to insure long leak-free operation. Semi-instantaneous operation provides high output by channeling the incoming cold water directly over the heat exchanger tubes in a controlled manner to maximize the heat transfer rates compared to conventional stratified heat exchanger convection systems. Velocity of water and pressure drop are controlled by changing water flow directly across the heat exchanger, which increases heat transfer and inhibits scale formation.

At the time of the site visit, the domestic water heaters were set at 140°F. Four fractional horsepower pumps distribute water to end uses. The domestic hot water pipes are insulated, and the insulation is in good condition.

Indirect Fired Semi-Instantaneous Water Heaters & Control Panel

2.11 Refrigeration

The café and room 120B have several systems including two stand-up solid door refrigerators and freezers, two refrigerator chests, and three stand-up glass door refrigerators. There is a Scotsman ice machine located in room 214. All equipment is high efficiency and in good condition.

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

Stand-up Solid Door Refrigerator & Freezer

2.12

2.13 Plug Load & Vending Machines

There are approximately 185 computer workstations throughout the facility. Plug loads throughout the building include general café and office equipment. There are classroom typical loads such as smart boards and projectors.

There are several residential style refrigerators throughout the building. There are also several laboratory refrigerators and freezers that are used to store non-volatile reagents and other specimens at various temperatures. There are also typical office loads such as copiers, small printers, televisions, microwaves, water coolers, coffee machines, and mini fridges. The computer room (data center) houses a UPS (HPC Clusters) system with a 40kW capacity. The building plug load equipment accounts for approximately 9% of the building total electric consumption.

Copier & Residential Style Refrigerator

Shop Plug Load Equipment & Washing/Drying Machines

Labs Refrigerators Other Plug Load

2.14 Water-Using Systems

There are restrooms with toilets, urinals, and sinks. The restroom sinks have low flow devices.

Typical Restroom Sinks

2.15 Process Equipment

The building process equipment includes vacuum and compressed air systems. One Powerex medical vacuum system, located in the Penthouse, is comprised of a single tank and two 5 hp medical vacuum compressor pumps. A second Powerex system located in mechanical room 004 consists of two 15 hp vacuum pumps and a tank. These systems are designed to provide a vacuum source for laboratories and other operations requiring a reliable, proven vacuum system.

Additionally, there is a compressed air system located in the Penthouse consisting of a single tank, four 5 hp air compressor pumps and associated piping that provides compressed air to the shop (room 111).

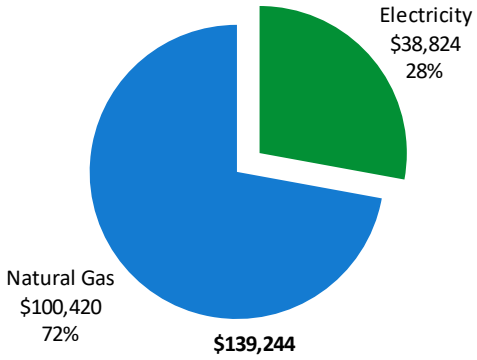
The vacuum and compressed air pumps are direct-drive operated by a totally enclosed fan cooled (TEFC) through a shaft coupling. Each system is outfitted with a control panel that has automatic pump alteration and minimum run timers so that usage is equalized among the pump systems and to prevent motor overload and damage from too frequent starting. The systems are well maintained.

Four 5 hp & Two 15 hp Compressors

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	1,362,794 kWh	$38,824
Natural Gas	236,893 Therms	$100,420
Total		**$139,244**



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.

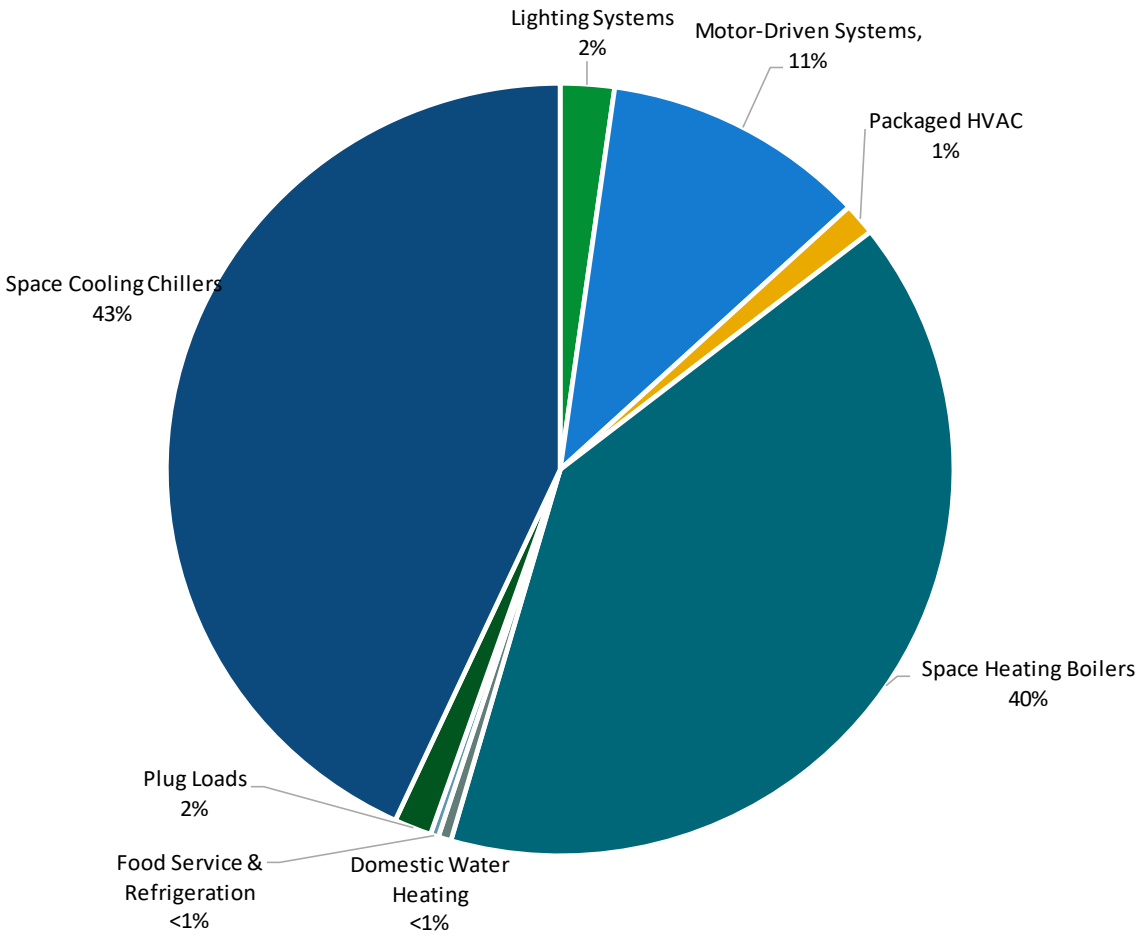
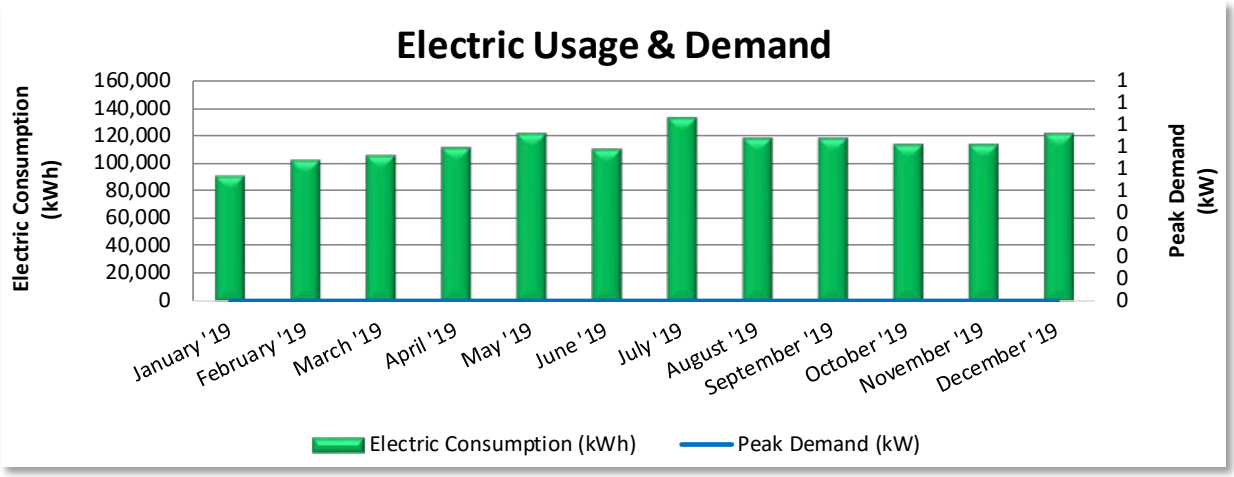


Figure 5 - Energy Balance

3.1 Electricity

PSE&G delivers electricity under rate class High Tension Service (HTS). Electricity for the building is supplemented by the cogeneration plant.



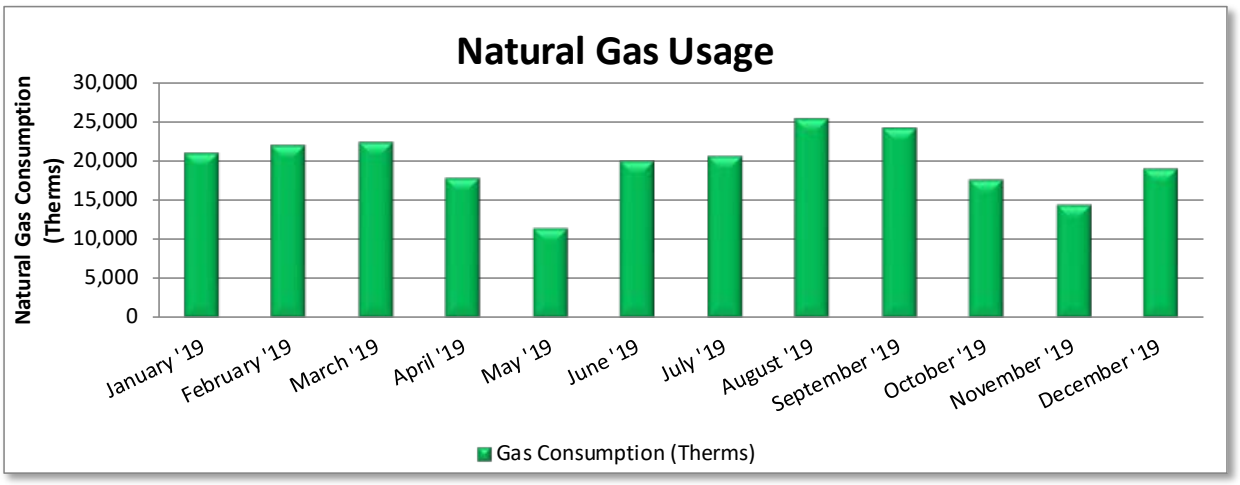
Electric Billing Data						
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**	**TRC Estimated Usage?**
1/28/19	31	90,765	0	$0	$1,981	Yes
2/28/19	31	102,443	0	$0	$2,520	Yes
3/28/19	28	105,976	0	$0	$2,304	Yes
4/28/19	31	111,344	0	$0	$2,506	Yes
5/29/19	31	122,284	0	$0	$4,509	Yes
6/27/19	29	110,493	0	$0	$3,511	Yes
7/29/19	32	133,407	0	$0	$4,809	Yes
8/27/19	29	118,496	0	$0	$3,364	Yes
9/26/19	30	118,431	0	$0	$3,684	Yes
10/25/19	29	114,446	0	$0	$3,176	Yes
11/25/19	31	113,360	0	$0	$2,739	Yes
12/11/19	33	121,349	0	$0	$3,721	Yes
Totals	**365**	**1,362,794**	**0**	**$0**	**$38,824**	
Annual	**365**	**1,362,794**	**0**	**$0**	**$38,824**	

Notes:

- Electric data has been estimated based on a campus wide approach and utilization of sub metered data. Please refer to the Power House/Cogen Building report for details regarding utility baseline and campus building utility desegregation.
- The peak demand for this facility was unavailable because the building is served with electricity from the master meter.
- The average purchased electric cost over the past 12 months was $0.147/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.
- Effectively all of the electricity generated on-site is used on-site.

3.2 Natural Gas

PSE&G delivers natural gas for the main boiler meter under rate class TSGNF.



Gas Billing Data				
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**	**TRC Estimated Usage?**
1/28/19	31	21,178	$7,961	Yes
2/28/19	31	22,019	$10,494	Yes
3/28/19	28	22,560	$10,142	Yes
4/28/19	31	17,816	$7,473	Yes
5/29/19	31	11,465	$4,976	Yes
6/27/19	29	20,129	$8,697	Yes
7/29/19	32	20,731	$8,395	Yes
8/27/19	29	25,503	$10,003	Yes
9/26/19	30	24,190	$9,699	Yes
10/25/19	29	17,677	$7,563	Yes
11/25/19	31	14,472	$6,385	Yes
12/11/19	33	19,153	$8,629	Yes
Totals	**365**	**236,893**	**$100,420**	
Annual	**365**	**236,893**	**$100,420**	

Notes:

- Natural gas data has been estimated based on a campus wide approach. Please refer to the Power House/Cogen Building report for details regarding the utility baseline and campus building utility desegregation analysis.
- The average gas cost for the past 12 months is $0.423/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.

Benchmarking Score	N/A

Due to its unique characteristics, this building type is not able to receive a benchmarking score. This report contains suggestions about how to improve building performance and reduce energy costs.

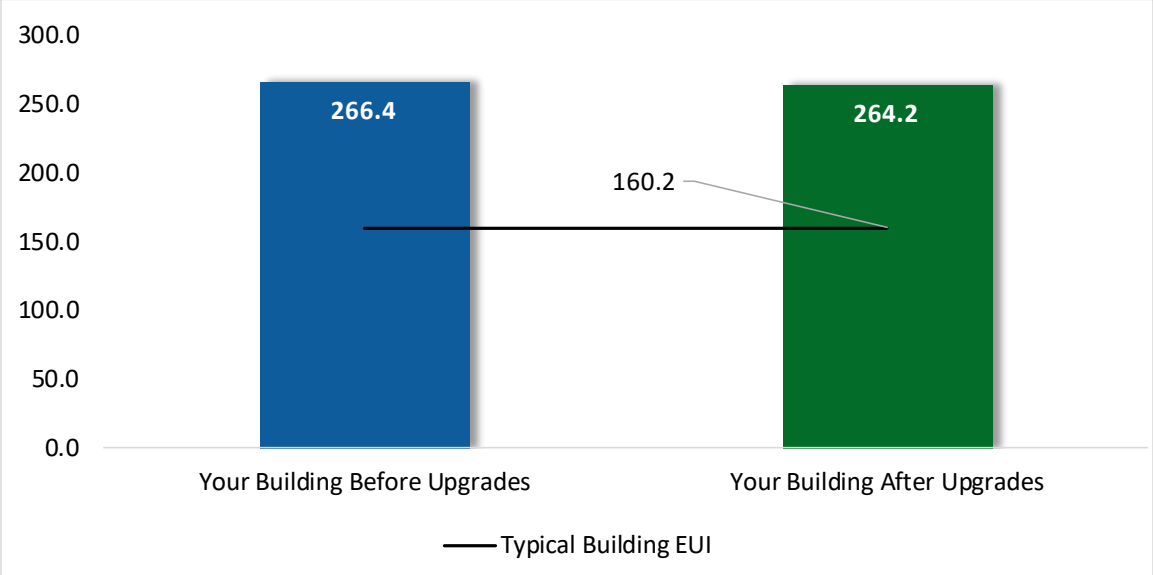


Figure 6 - Energy Use Intensity Comparison[3]

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.

Benchmarking is provided for The College of New Jersey's campus. Please refer to the Power House/Cogen report for additional details regarding the benchmarking approach within Portfolio Manager®.

[3] Based on all evaluated ECMs

Tracking Your Energy Performance

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 ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**71,854**	**10.1**	**-16**	**$10,503**	**$23,779**	**$6,262**	**$17,517**	**1.7**	**70,469**
ECM 1	Retrofit Fixtures with LED Lamps	Yes	71,854	10.1	-16	$10,503	$23,779	$6,262	$17,517	1.7	70,469
TOTALS			**71,854**	**10.1**	**-16**	**$10,503**	**$23,779**	**$6,262**	**$17,517**	**1.7**	**70,469**

* - 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 7 – All Evaluated ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**71,854**	**10.1**	**-16**	**$10,503**	**$23,779**	**$6,262**	**$17,517**	**1.7**	**70,469**
ECM 1	Retrofit Fixtures with LED Lamps	71,854	10.1	-16	$10,503	$23,779	$6,262	$17,517	1.7	70,469

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: Retrofit Fixtures with LED Lamps

Replace fluorescent T9 and CFL 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 and CFLs.

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.

Operation and maintenance (O&M) plans enhance the operational efficiency of HVAC and other energy intensive systems and could save between 5 to 20 percent of the energy usage in your building without substantial capital investment. A successful plan includes your records of energy usage trends and costs, building equipment lists, current maintenance practices, planned capital upgrades, and incorporates your ideas for improved building operation. Your plan will address goals for energy-efficient operation, provide detail on how to reach the goals, and will outline procedures for measuring and reporting whether goals have been achieved.

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.

Doors and Windows

Close exterior doors and windows in heated and cooled areas. Leaving doors and windows open leads to a loss of heat during the winter and chilled air during the summer. Reducing air changes per hour (ACH) can lead to increased occupant comfort as well as heating and cooling savings, especially when combined with proper HVAC controls and adequate ventilation.

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.

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

Lighting Controls

As part of a lighting maintenance schedule, test lighting controls to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight and photocell sensors, maintenance involves cleaning sensor lenses and confirming that setpoints and sensitivity are configured properly. Adjust exterior lighting time clock controls seasonally as needed to match your lighting requirements.

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.

Thermostat Schedules and Temperature Resets

Use thermostat setback temperatures and schedules to reduce heating and cooling energy use during periods of low or no occupancy. Thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced by increasing the facility's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

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.

Steam Trap Repair and Replacement

Steam traps are a crucial part of delivering heat from the boiler to the space heating units. Steam traps are automatic valves that remove condensate from the system. If the traps fail closed, condensate can build up in the steam supply side of the trap which reduces the flow in the steam lines and thermal capacity of the radiators. Or they may fail open, allowing steam into the condensate return lines resulting in wasted energy, water, and hammering. Losses can be significantly reduced by testing and replacing equipment as they start to fail. Repair or replace traps that are blocked or allowing steam to pass. Inspect steam traps as part of a regular steam system maintenance plan.

Compressed Air System Maintenance

Compressed air systems require periodic maintenance to operate at peak efficiency. A maintenance plan for compressed air systems should include:

- Inspection, cleaning, and replacement of inlet filter cartridges
- Cleaning of drain traps
- Daily inspection of lubricant levels to reduce unwanted friction
- Inspection of belt condition and tension
- Check for leaks and adjust loose connections
- Overall system cleaning

Contact a qualified technician for help with setting up periodic maintenance schedule.

Plug Load Controls

Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips[6]. Your local utility may offer incentives or rebates for this equipment.

[6] For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" http://www.nrel.gov/docs/fy13osti/54175.pdf, or "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

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[7] or download a copy of EPA's "WaterSense® at Work: Best Management Practices for Commercial and Institutional Facilities"[8] 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.

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

[8] 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.

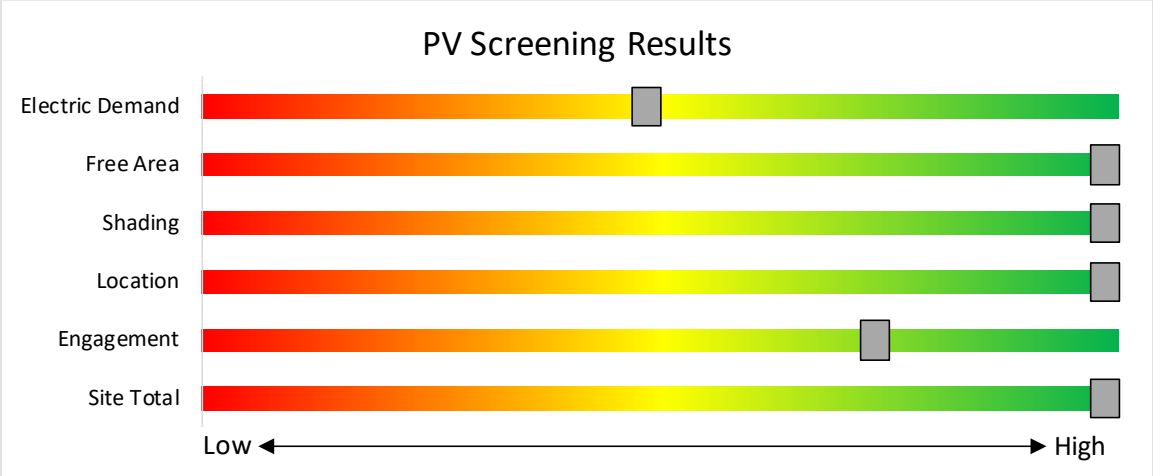
6.1 Solar Photovoltaic

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, ease of installation (location), and the lack of shading elements contribute to the high potential. A PV array located on the roof 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	311	kW DC STC
Electric Generation	370,516	kWh/yr
Displaced Cost	$54,510	/yr
Installed Cost	$808,600	

Figure 8 - Photovoltaic Screening

Transition Incentive (TI) Program

The TI program is a bridge between the Legacy SREC Program and a to-be determined Successor Incentive Program. The program 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 TRECs (Transition Incentive Renewable Energy Certificates). The Transition Incentive is structured as a factorized renewable energy certificate. The factors allow the TI Program to provide differentiated financial incentives for different types of solar installation.

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:

Transition Incentive (TI) Program: https://www.njcleanenergy.com/renewable-energy/programs/transition-incentive-program

- **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.

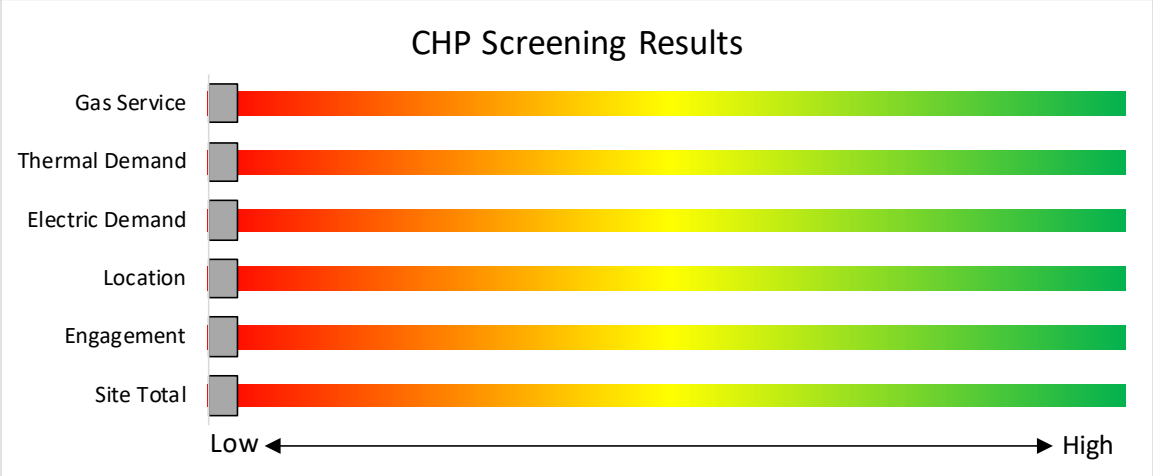


Figure 9 - Combined Heat and Power Screening

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 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.	Incentives are paid out in three installments. The first installment is meant to help offset the costs of the initial engineering study. The subsequent incentives are paid based on the level of energy savings up to 50% of the total project cost. See Section 7.3 for all incentive details.
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.

Based on the site building and utility data provided, the facility does not meet the requirements of the current DI program.

Incentives

The program pays up to 70 percent 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 percent of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30 percent 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 percent 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.

For master metered campuses, such as The College of New Jersey, P4P eligibility is evaluated at the campus level. For the purposes of reporting P4P eligibility is being presented at all of the buildings. Final eligibility will be assessed once all of the reports are completed and will be addressed at the Exit Meeting. If the campus does not meet the 15% savings threshold based on measures identified during the LGEA Program process it is possible that additional measures could be identified at a later point in time, for example through further evaluation or the Energy Savings Improvement Program process.

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 descriptions 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 Transition Incentive (TI) Program

The TI program is a bridge between the Legacy SREC Program and a to-be determined Successor Incentive Program. The program 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 TRECs (Transition Incentive Renewable Energy Certificates). The Transition Incentive is structured as a factorized renewable energy certificate. The factors allow the TI Program to provide differentiated financial incentives for different types of solar installations. NJBPU calculates the value of a Transition Renewable Energy Certificate (TREC) by multiplying the base compensation rate ($152/MWh) by the project's assigned factor (i.e. $152 x 0.85 = $129.20/MWh). The TREC factors are defined based on the chart below:

Project Type	Factor
Subsection (t): landfill, brownfield, areas of historic fill	1.00
Grid supply (Subsection (r)) rooftop	1.00
Net metered non-residential rooftop and carport	1.00
Community solar	0.85
Grid supply (Subsection (r)) ground mount	0.60
Net metered residential ground mount	0.60
Net metered residential rooftop and carport	0.60
Net metered non-residential ground mount	0.60

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 TRECs.

Eligible projects may generate TRECs for 15 years following the commencement of commercial operations (also referred to as the "Transition Incentive Qualification Life"). After 15 years, projects may be eligible for a NJ Class I REC.

TRECs will be used by the identified compliance entities to satisfy a compliance obligation tied to a new Transition Incentive Renewable Portfolio Standard ("TI-RPS"), which will exist in parallel with, and completely separate from, the existing Solar RPS for Legacy SRECs. The TI-RPS is a carve-out of the current Class I RPS requirement. The creation of TRECs is based upon metered generation supplied to PJM-EIS General Attribute Tracking System ("GATS") by the owners of eligible facilities or their agents. GATS would create one TREC for each MWh of energy produced from a qualified facility.

TRECs will be purchased monthly by a TREC Administrator who will allocate the TRECs to the Load Serving Entities (BGS Providers and Third-Party Suppliers) annually based on their market share of retail electricity sold during the relevant Energy Year.

Solar projects help the State of New Jersey reach renewable energy goals outlined in the state's Energy Master Plan. The Transition Incentive Program online portal is now open to new applications effective May 1, 2020. There are instructions on "How and When to Transfer my SRP Registration to the Transition Incentive Program". If you are considering installing solar photovoltaics on your building, visit the following link for more information:

https://www.njcleanenergy.com/renewable-energy/programs/transition-incentive-program

8 PROJECT DEVELOPMENT

Energy conservation measures (ECMs) have been identified for your site and their energy and economic analyses are provided within this LGEA report. The next steps with project development are to set goals and create a comprehensive project plan. The graphic below provides an overview of the process flow for a typical energy efficiency or renewable energy project. We recommend implementing as many ECMs as possible prior to undertaking a feasibility study for a renewable project. The cyclical nature of this process flow demonstrates the ongoing work required to continually improve building energy efficiency over time. If your building(s) scope of work is relatively simple to implement or small in scope, the measurement and verification (M&V) step may not be required. It should be noted through a typical project cycle, there will be changes in costs based on specific scopes of work, contractor selections, design considerations, construction, etc. The estimated costs provided throughout this LGEA report demonstrate the unburdened turn-key material and labor cost only. There will be contingencies and additional costs at the time of implementation. We recommend comprehensive project planning includes the review of multiple bids for project work, incorporate potential operational & maintenance (O&M) cost savings and maximize your incentive potential.

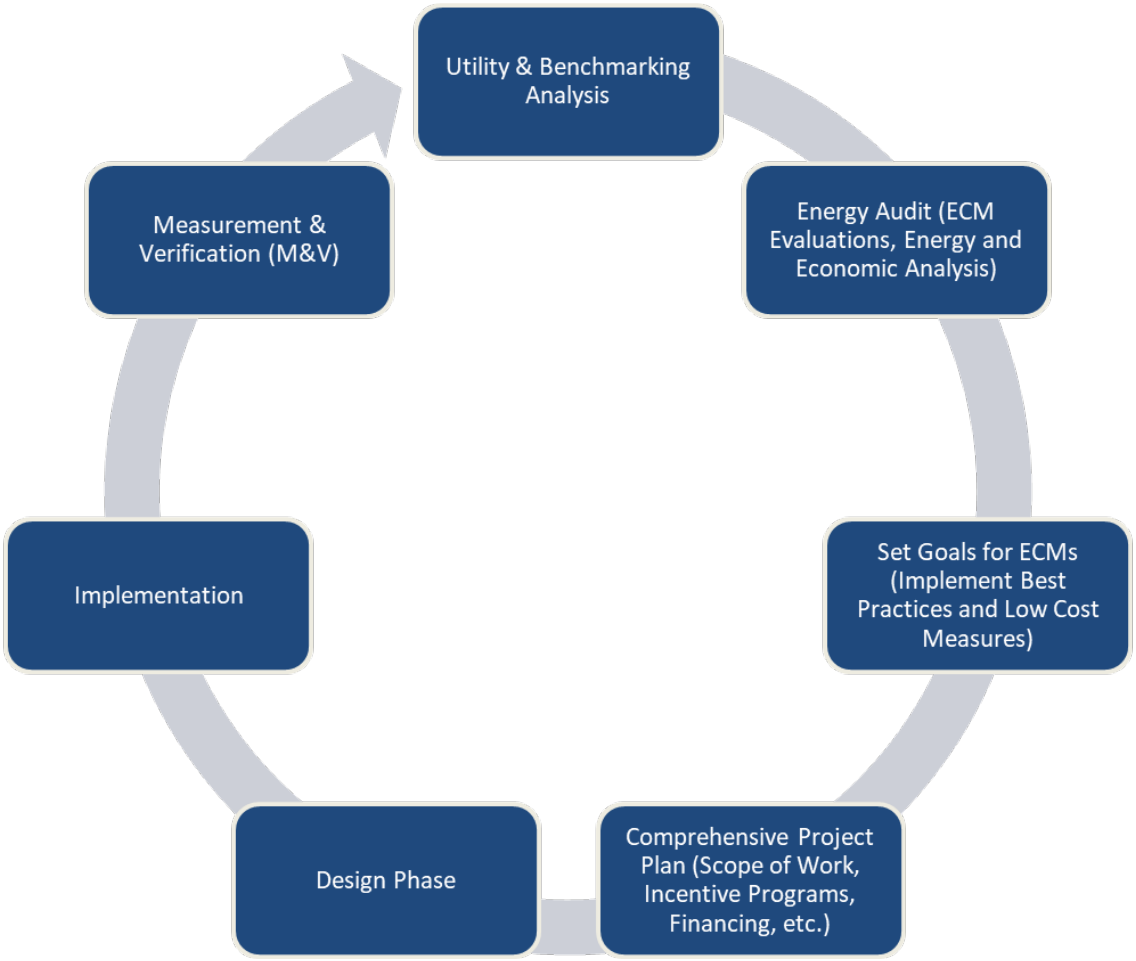


Figure 10 – Project Development Cycle

9 Energy Purchasing and Procurement Strategies

9.1 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[9].

9.2 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[10].

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

[10] 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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Room 1-E1	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	367	0	$54	$110	$30	1.5
Room 1-E2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Roo 1-T1	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	367	0	$54	$110	$30	1.5
Room 1-T2	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	367	0	$54	$110	$30	1.5
Room 2-E4	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Room 2-EB	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 2-T2	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	367	0	$54	$110	$30	1.5
Back 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
Back Entrance	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Bridgeway 2nd Floor	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
Bridgeway 2nd Floor	22	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	22	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Cafe	6	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	6	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Cafe	11	LED - Fixtures: Downlight Pendant - Circular LED Fixture	Occupancy Sensor	S	36	3,709		None	No	11	LED - Fixtures: Downlight Pendant - Circular LED Fixture	Occupancy Sensor	36	3,709	0.0	0	0	$0	$0	$0	0.0
Classroom 102	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
Classroom 102	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Common Area - Restrooms	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Common Area 1st Floor	4	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	4	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Common Area 2nd Floor	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Common Area 2nd Floor	12	LED - Fixtures: Downlight Pendant - Circular LED Fixture	Occupancy Sensor	S	36	3,709		None	No	12	LED - Fixtures: Downlight Pendant - Circular LED Fixture	Occupancy Sensor	36	3,709	0.0	0	0	$0	$0	$0	0.0
Corridor 1st Floor	10	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	10	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 1st Floor	40	LED - Fixtures: Downlight Pendant	Occupancy Sensor	S	25	3,709		None	No	40	LED - Fixtures: Downlight Pendant	Occupancy Sensor	25	3,709	0.0	0	0	$0	$0	$0	0.0
Corridor 1st Floor	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Corridor 2nd Floor	11	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	11	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 2nd Floor	49	LED - Fixtures: Downlight Pendant	Occupancy Sensor	S	25	3,709		None	No	49	LED - Fixtures: Downlight Pendant	Occupancy Sensor	25	3,709	0.0	0	0	$0	$0	$0	0.0
Corridor 2nd Floor	9	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	9	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Cafe 2nd Floor	12	LED - Fixtures: Downlight Pendant - Circular LED Fixture	Occupancy Sensor	S	36	3,709		None	No	12	LED - Fixtures: Downlight Pendant - Circular LED Fixture	Occupancy Sensor	36	3,709	0.0	0	0	$0	$0	$0	0.0
Corridor 2nd Floor East	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
Corridor 2nd Floor East	11	LED - Fixtures: Downlight Pendant	Occupancy Sensor	S	25	3,709		None	No	11	LED - Fixtures: Downlight Pendant	Occupancy Sensor	25	3,709	0.0	0	0	$0	$0	$0	0.0
Corridor 2nd Floor East	4	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	4	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Corridor Cafe	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
Corridor Cafe	7	LED - Fixtures: Downlight Pendant	Occupancy Sensor	S	25	3,709		None	No	7	LED - Fixtures: Downlight Pendant	Occupancy Sensor	25	3,709	0.0	0	0	$0	$0	$0	0.0
Corridor Mechanical Room	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
Corridor Mechanical Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	367	0	$54	$110	$30	1.5
Elevator Bridgeway	3	LED - Fixtures: Downlight Recessed LED Fixture	Timeclock		16	1,380		None	No	3	LED - Fixtures: Downlight Recessed LED Fixture	Timeclock	16	1,380	0.0	0	0	$0	$0	$0	0.0
Entrance Stairs C	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
Entrance Stairs C	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Exterior Wall Pack	9	LED - Fixtures: Outdoor Porch Wall Mount	Timeclock		23	4,380		None	No	9	LED - Fixtures: Outdoor Porch Wall Mount	Timeclock	23	4,380	0.0	0	0	$0	$0	$0	0.0
Handicap Entrance	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Handicap 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
Handicap Entrance	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Janitorial 1-R3	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Janitorial 1-R3	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Janitorial 1-R6	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Janitorial 2-R4	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,882	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,882	0.0	62	0	$9	$37	$10	2.9
Main Electrical Room 005	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
Main Electrical Room 005	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,419	1	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,419	0.1	639	0	$93	$292	$80	2.3
Mechanical Room 004	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
Mechanical Room 004	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,419	1	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,419	0.3	1,597	0	$233	$730	$200	2.3
Mechanical Room 2-M1	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,419	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,419	0.1	479	0	$70	$219	$60	2.3
Middle Roof	6	Compact Fluorescent: (3) 26W G25 Screw-In Lamps	Photocell		78	4,380	1	Relamp	No	6	LED Lamps: LED Plug-In Lamps	Photocell	55	4,380	0.0	615	0	$90	$454	$36	4.6

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Middle Roof	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
North Ground Lobby	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
North Ground Lobby	5	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	5	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	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
Penthouse Mechanical Space	62	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,688	1	Relamp	No	62	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,688	1.0	5,500	-1	$804	$2,264	$620	2.0
Restroom - All Gender	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - All Gender	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - All Gender	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - All Gender	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Men's	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Men's	2	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	S	15	3,709		None	No	2	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	15	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Men's	3	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	3	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Women's	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Women's	2	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	S	15	3,709		None	No	2	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	15	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Women's	3	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	3	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Women's	1	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	S	15	3,709		None	No	1	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	15	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Women's	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Women's	3	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	3	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Women's	1	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	S	15	3,709		None	No	1	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	15	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Women's	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom - Women's	3	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	3	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom Men's 2nd Floor	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom Men's 2nd Floor	1	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	S	15	3,709		None	No	1	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	15	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom Men's 2nd Floor	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom Men's 2nd Floor	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Restroom Men's 2nd Floor	1	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	S	15	3,709		None	No	1	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	15	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom Men's 2nd Floor	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom Women's 2nd Floor	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom Women's 2nd Floor	1	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	S	15	3,709		None	No	1	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	15	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom Women's 2nd Floor	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom Women's 2nd Floor	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Restroom Women's 2nd Floor	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Roof	6	Compact Fluorescent: (3) 26W G25 Screw-In Lamps	Photocell		78	4,380	1	Relamp	No	6	LED Lamps: LED Plug-In Lamps	Photocell	55	4,380	0.0	615	0	$90	$454	$36	4.6
Roof	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
Roof South	5	Compact Fluorescent: (3) 26W G25 Screw-In Lamps	Photocell		78	4,380	1	Relamp	No	5	LED Lamps: LED Plug-In Lamps	Photocell	55	4,380	0.0	512	0	$75	$378	$30	4.6
Roof South	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 002	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 003 Trash	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	367	0	$54	$110	$30	1.5
Room 005A EES	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 1-AV1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Room 1-E1	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	367	0	$54	$110	$30	1.5
Room 100	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 100	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	734	0	$107	$219	$60	1.5
Room 101	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 101	4	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	4	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Room 101	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.2	1,469	0	$215	$438	$120	1.5
Room 103	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 103	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Room 103	4	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	4	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Room 103	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.3	2,326	-1	$340	$694	$190	1.5

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Room 103A	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Room 103B	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Room 103C	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	32	3,709		None	No	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	32	3,709	0.0	0	0	$0	$0	$0	0.0
Room 103D	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	32	3,709		None	No	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	32	3,709	0.0	0	0	$0	$0	$0	0.0
Room 104	8	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	8	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Room 105	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 105	40	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	40	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.7	4,896	-1	$716	$1,461	$400	1.5
Room 105A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	490	0	$72	$146	$40	1.5
Room 105B	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	734	0	$107	$219	$60	1.5
Room 106	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
Room 106	5	LED - Fixtures: Downlight Pendant	Occupancy Sensor	S	18	3,709		None	No	5	LED - Fixtures: Downlight Pendant	Occupancy Sensor	18	3,709	0.0	0	0	$0	$0	$0	0.0
Room 106	37	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	37	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.6	4,529	-1	$662	$1,351	$370	1.5
Room 106A	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 107	25	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	25	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.4	3,060	-1	$447	$913	$250	1.5
Room 108	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 108	14	LED - Fixtures: Shelf-Mounted Display and Task Lights	Wall Switch	S	11	4,570		None	No	14	LED - Fixtures: Shelf-Mounted Display and Task Lights	Wall Switch	11	4,570	0.0	0	0	$0	$0	$0	0.0
Room 108	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.3	2,571	-1	$376	$767	$210	1.5
Room 109	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 109	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Room 109A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	490	0	$72	$146	$40	1.5
Room 110	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 110	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 111	48	LED - Fixtures: Downlight Pendant	Occupancy Sensor	S	18	3,709		None	No	48	LED - Fixtures: Downlight Pendant	Occupancy Sensor	18	3,709	0.0	0	0	$0	$0	$0	0.0
Room 111A (Paint Boot))	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,344	1	Relamp	No	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,344	0.3	753	0	$110	$730	$200	4.8
Room 112	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	2	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Room 112	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.2	1,714	0	$250	$511	$140	1.5
Room 113	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	734	0	$107	$219	$60	1.5
Room 114	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 115	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 116	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 117	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 118	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 119	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 120B	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	32	3,709		None	No	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	32	3,709	0.0	0	0	$0	$0	$0	0.0
Room 200	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	734	0	$107	$219	$60	1.5
Room 200A	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 201	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 202	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 203	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 204	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	50	3,709		None	No	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	50	3,709	0.0	0	0	$0	$0	$0	0.0
Room 205	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 206	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 207	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 208	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 209	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	1	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Room 210	4	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	4	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Room 210	6	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	6	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Room 211	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 211	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor		10	3,709		None	No	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Room 211	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	857	0	$125	$256	$70	1.5

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Room 212	6	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	32	3,709		None	No	6	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	32	3,709	0.0	0	0	$0	$0	$0	0.0
Room 213	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 213	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor		10	3,709		None	No	2	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Room 213	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	857	0	$125	$256	$70	1.5
Room 214	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 214	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,709	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	734	0	$107	$219	$60	1.5
Room 216	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	612	0	$89	$183	$50	1.5
Room 217	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 217	4	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor		10	3,709		None	No	4	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Room 217	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.2	1,714	0	$250	$511	$140	1.5
Room 218	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 218	30	LED - Fixtures: Shelf-Mounted Display and Task Lights	Wall Switch		11	4,570		None	No	30	LED - Fixtures: Shelf-Mounted Display and Task Lights	Wall Switch	11	4,570	0.0	0	0	$0	$0	$0	0.0
Room 218	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 218A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	367	0	$54	$110	$30	1.5
Room 218B	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	367	0	$54	$110	$30	1.5
Room 219	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 219A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Room 220	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	490	0	$72	$146	$40	1.5
Room 221	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 221	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,709	1	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	857	0	$125	$256	$70	1.5
Room 221A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Room 221A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Room 222	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 222	4	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor		10	3,709		None	No	4	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Room 222	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.3	2,448	-1	$358	$730	$200	1.5

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Room 222A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	367	0	$54	$110	$30	1.5
Room 224	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	32	3,709		None	No	1	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	32	3,709	0.0	0	0	$0	$0	$0	0.0
Room 225	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 226	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 227	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 228	4	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	40	3,709		None	No	4	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	40	3,709	0.0	0	0	$0	$0	$0	0.0
Room 228	6	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	6	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Room 229	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 230	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 231	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 232	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 232	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,709	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	734	0	$107	$219	$60	1.5
Room 232A	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 232B	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 233	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	6	LED - Fixtures: Shelf-Mounted Display and Task Lights	Wall Switch		11	4,570		None	No	6	LED - Fixtures: Shelf-Mounted Display and Task Lights	Wall Switch	11	4,570	0.0	0	0	$0	$0	$0	0.0
Room 233	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	27	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.4	3,305	-1	$483	$986	$270	1.5
Room 233A	6	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	32	3,709		None	No	6	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	32	3,709	0.0	0	0	$0	$0	$0	0.0
Room 234	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 234	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Room 235	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 235	6	LED - Fixtures: Shelf-Mounted Display and Task Lights	Wall Switch		11	4,570		None	No	6	LED - Fixtures: Shelf-Mounted Display and Task Lights	Wall Switch	11	4,570	0.0	0	0	$0	$0	$0	0.0
Room 235	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.4	2,938	-1	$429	$876	$240	1.5
Room 236	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Room 237	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	490	0	$72	$146	$40	1.5

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Room 238	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 238	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,709	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	734	0	$107	$219	$60	1.5
Room 239	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	32	3,709		None	No	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	32	3,709	0.0	0	0	$0	$0	$0	0.0
Room 240	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 240	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,709	1	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.3	2,448	-1	$358	$730	$200	1.5
Room 241	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 241	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,709	1	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.3	2,448	-1	$358	$730	$200	1.5
Room 241A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	367	0	$54	$110	$30	1.5
Room 242	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 243	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 244	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 245	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 246	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.1	490	0	$72	$146	$40	1.5
Room 247	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 248	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	245	0	$36	$73	$20	1.5
Room 302	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Room 303	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,709	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,709	0.0	122	0	$18	$37	$10	1.5
Stairs A	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
Stairs A	7	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor		18	3,709		None	No	7	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	18	3,709	0.0	0	0	$0	$0	$0	0.0
Stairs B	3	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	S	18	3,709		None	No	3	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	18	3,709	0.0	0	0	$0	$0	$0	0.0
Stairs C	4	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	S	18	3,709		None	No	4	LED - Fixtures: Surfaced Mounted LED Fixtures	Occupancy Sensor	18	3,709	0.0	0	0	$0	$0	$0	0.0
Café	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	S	32	3,709		None	No	3	LED - Fixtures: Recessed LED Fixtures	Occupancy Sensor	32	3,709	0.0	0	0	$0	$0	$0	0.0
Café	8	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	S	10	3,709		None	No	8	LED - Fixtures: Downlight Recessed Can LED Fixture	Occupancy Sensor	10	3,709	0.0	0	0	$0	$0	$0	0.0
Café	6	LED - Fixtures: Linear Strip	Occupancy Sensor	S	23	3,709		None	No	6	LED - Fixtures: Linear Strip	Occupancy Sensor	23	3,709	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?	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Penthouse Mechanical Space	Room 111	4	Air Compressor	5.0	89.5%	No			W	1,095		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	Laboratories	2	Air Compressor	15.0	93.0%	No			W	1,095		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	Chilled Water System	2	Chilled Water Pump	7.5	88.5%	Yes			W	1,232		No	88.5%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	Chilled Water System - MAU-100	2	Chilled Water Pump	1.5	79.0%	No			W	1,232		No	79.0%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	Exhaust Fan	1	Exhaust Fan	0.2	65.0%	No			W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	Exhaust Fan	1	Exhaust Fan	2.0	84.0%	No			W	2,745		No	84.0%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	Heating Hot Water System - AHU-102	2	Heating Hot Water Pump	1.0	67.0%	No			W	1,792		No	67.0%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	Heating Hot Water System - AHU-101	2	Heating Hot Water Pump	1.0	67.0%	No			W	1,792		No	67.0%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	Heating Hot Water System - MAU-100	2	Heating Hot Water Pump	0.5	76.2%	No			W	1,792		No	76.2%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	Glycol Pumps	2	Process Pump	2.0	86.5%	No			W	961		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	Glycol Pumps	2	Process Pump	5.0	89.5%	No			W	961		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	AHU-101	2	Supply Fan	75.0	95.4%	Yes			W	2,184		No	95.4%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	AHU-101	1	Return Fan	15.0	93.0%	Yes			W	4,368		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	AHU-102	2	Supply Fan	75.0	95.4%	Yes			W	2,184		No	95.4%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	AHU-102	1	Return Fan	10.0	91.7%	Yes			W	4,368		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	MAU-100	1	Supply Fan	20.0	93.0%	Yes			W	4,368		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room 004	Chilled Water System	3	Chilled Water Pump	25.0	93.6%	Yes			W	1,643		No	93.6%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room 004	Heating Hot Water System	2	Heating Hot Water Pump	25.0	93.6%	Yes			W	1,792		No	93.6%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room 004	Sump Pumps	6	Other	0.5	65.0%	No			W	961		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room 004	Medical Vacuum Pump	2	Air Compressor	5.0	88.5%	No			W	1,100		No	88.5%	No		0.0	0	0	$0	$0	$0	0.0

		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?	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Room 004	Laboratories Process Pump	1	Process Pump	0.3	65.0%	No			W	961		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room 004	Laboratories Process Pump	1	Process Pump	0.5	70.0%	No			W	961		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room 004	Laboratories Process Pump	2	Process Pump	2.0	85.5%	No			W	961		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room 004	Laboratories Process Pump	1	Process Pump	2.0	85.5%	No			W	961		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room 004	Cold Water Supply Pumps	2	Water Supply Pump	5.0	86.5%	Yes			W	1,373		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Main Electrical Room 005	Exhaust Fan	1	Exhaust Fan	1.0	84.0%	No			W	1,920		No	84.0%	No		0.0	0	0	$0	$0	$0	0.0
Janitorial	Exhaust Fan	1	Exhaust Fan	1.5	84.0%	No			W	1,920		No	84.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room 2-M1	AHU-301	1	Supply Fan	15.0	93.0%	Yes			W	2,184		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room 2-M1	AHU-302	1	Return Fan	7.5	91.7%	Yes			W	2,184		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Room 105	Laboratories Process Pump	1	Process Pump	7.5	91.0%	No			W	961		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-102A	1	Exhaust Fan	15.0	92.4%	Yes			W	1,920		No	92.4%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-102B	1	Exhaust Fan	15.0	92.4%	Yes			W	1,920		No	92.4%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-103A	1	Exhaust Fan	3.0	86.5%	Yes			W	1,920		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-103B	1	Exhaust Fan	3.0	86.5%	Yes			W	1,920		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-108	1	Exhaust Fan	1.0	82.0%	No			W	1,920		No	82.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-107	1	Exhaust Fan	3.0	85.5%	Yes			W	1,920		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Middle Roof	EF-101A, 101B, 101C	3	Exhaust Fan	60.0	94.5%	Yes			W	2,482		No	94.5%	No		0.0	0	0	$0	$0	$0	0.0
Middle Roof	ERU-100	2	Supply Fan	25.0	93.6%	Yes			W	1,680		No	93.6%	No		0.0	0	0	$0	$0	$0	0.0
Middle Roof	ERU-100 Wheel Motors	2	Other	0.8	77.0%	Yes			W	1,680		No	77.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	DC-101 - Data Center	3	Supply Fan	1.0	84.0%	No			W	8,760		No	84.0%	No		0.0	0	0	$0	$0	$0	0.0

		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?	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Roof	DC-102 - Data Center	4	Supply Fan	1.0	84.0%	No			W	8,760		No	84.0%	No		0.0	0	0	$0	$0	$0	0.0
Elevator Room	Elevator	1	Other	75.0	85.5%	No			W	880		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
STEM Building	Various Spaces (Cabinet Unit Heaters)	12	Supply Fan	0.1	65.0%	No			W	1,784		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
STEM Building	Various Spaces (Unit Heaters)	18	Supply Fan	0.1	65.0%	No			W	1,784		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Various Location	Fan coils units	6	Fan Coil Unit	0.3	65.0%	No			W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0

Packaged 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)	Cooling Mode Efficiency (SEER/IEER/ EER)	Heating Mode Efficiency	Manufacturer	Model	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/IEER/ EER)	Heating Mode Efficiency	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Roof	DC-101 - Data Center	1	Split-System Air-Source HP	10.68	51.18	12.00	1 COP	Colmac Coil	AFV-54144-1036L	W		No							0.0	0	0	$0	$0	$0	0.0
Roof	DC-102 - Data Center	1	Split-System Air-Source HP	10.68	51.18	12.00	1 COP	Colmac Coil		W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	ACCU-104 - Room 1-E1	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	ACCU-106 - Room 1-E2	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	AC-301 - Room 1-AV1	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	AC-10 - Room 1-T2	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	AC-10 - Room 2-E1	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	AC-107 - Room 2-E2	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Mechanical Room 004	AC-109 -Room 201	1	Split-System Air-Source HP	1.50	18.00	15.00	8.2 HSPF	Daikin	RKN18NMVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Mechanical Room 004	AC-111 - Room 202	1	Split-System Air-Source HP	1.50	18.00	15.00	8.2 HSPF	Daikin	RKN18NMVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	AC-112 - Room 303	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	ACCU-103 - Room 2-T1	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	ACUC-102 - Room1-E3	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	ACCU-108 - Room 2-E3	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	ACCU-110 - Elevator Room	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	ACCU-101 - Room 1-T1	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	ACCU-105	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	AC-109 - EES Room	1	Ductless Mini-Split AC	1.50		18.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	Room 002	1	Ductless Mini-Split AC	1.50		19.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Penthouse Mechanical Space	AC-301 - Room 1-AV1	1	Ductless Mini-Split AC	1.50		17.20		Daikin	RZR18PVJU	W		No							0.0	0	0	$0	$0	$0	0.0

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)	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Central Plant	Building Chilled Water	1	Water-Cooled Centrifugal Chiller	507.00	Central Plant	Proxy Chiller	W		No							0.0	0	0	$0	$0	$0	0.0

Space Heating Boiler 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)	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Central Plant	Building Space Heating	1	Forced Draft Steam Boiler	5,614	Central Plant	Proxy Boiler	W		No						0.0	0	0	$0	$0	$0	0.0
Central Plant	Building Chilled Water	1	Other	6,084	Central Plant	Proxy Steam Chiller	W		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	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Central Plant	Building	1	Indirect System	Central Plant	Proxy Boiler	W		No						0.0	0	0	$0	$0	$0	0.0

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Room 120B	1	Stand-Up Freezer, Solid Door (16 - 30 cu. ft.)	Delfield	One Section	Yes		No	0.0	0	0	$0	$0	$0	0.0
Room 120B	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Delfield	Two Sections	Yes		No	0.0	0	0	$0	$0	$0	0.0
Café	1	Stand-Up Freezer, Solid Door (16 - 30 cu. ft.)	Delfield	One Section	Yes		No	0.0	0	0	$0	$0	$0	0.0
Café	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Delfield	Two Sections	Yes		No	0.0	0	0	$0	$0	$0	0.0
Café	1	Refrigerator Chest		TRUE	No		No	0.0	0	0	$0	$0	$0	0.0
Café	3	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)			Yes		No	0.0	0	0	$0	$0	$0	0.0
Café	2	Refrigerator Chest	Beverage Air		No		No	0.0	0	0	$0	$0	$0	0.0

Commercial Ice Maker Inventory & Recommendations

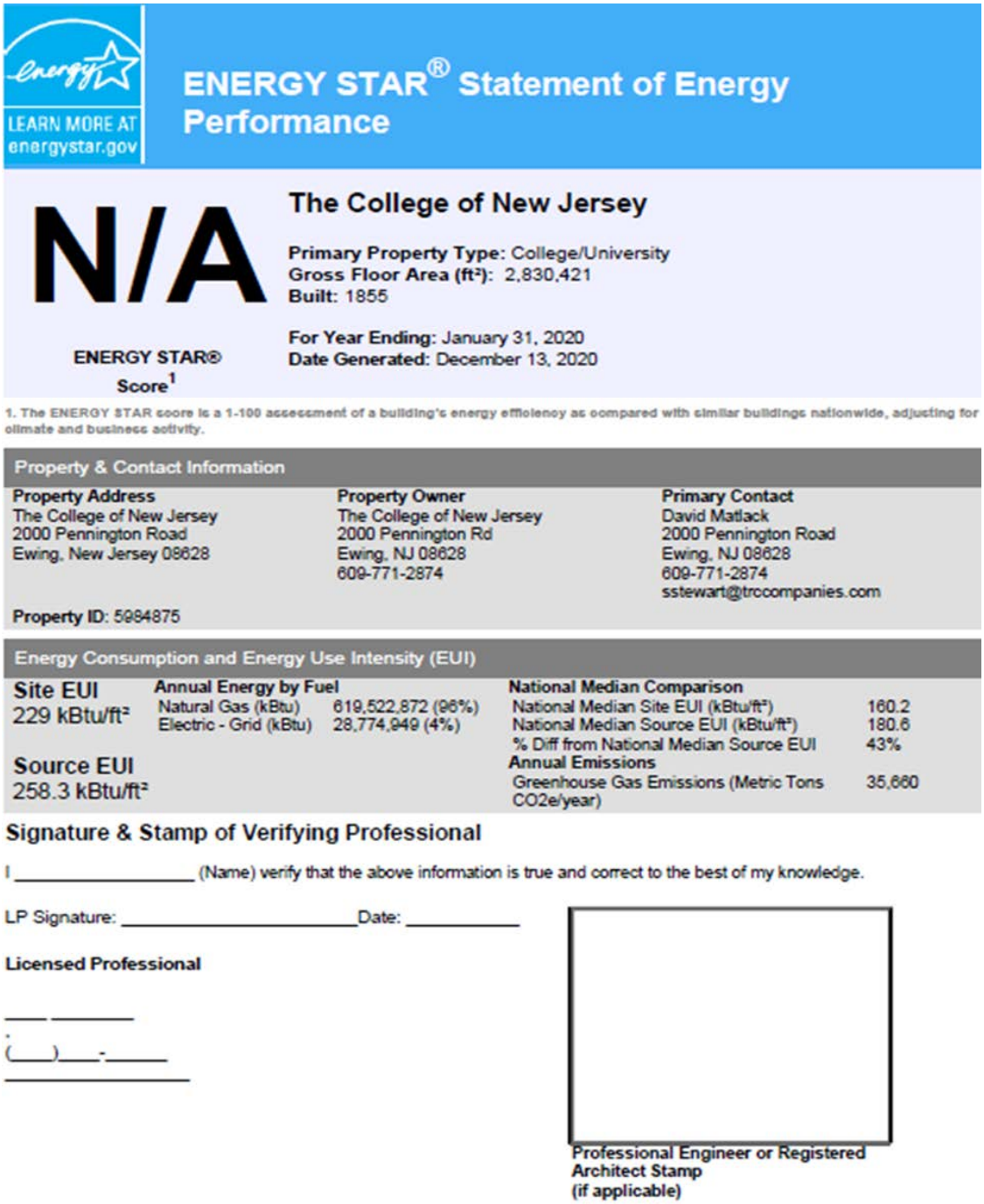
	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker Type	Manufacturer	Model	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Room 214	1	Ice Making Head (<450 lbs/day), Batch	Scotsman	AFE424	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?	Manufacturer	Model
STEM Building	1	Washing Machine	1,300	No		
STEM Building	1	Drying Machine	1,800	No		
STEM Building	6	Coffee Machine	600	No		
STEM Building	185	Desktop	120	Yes		
STEM Building	4	Microwave	1,000	No		
STEM Building	4	Paper Shredder	200	No		
STEM Building	54	Printer (Medium/Small)	120	Yes		
STEM Building	4	Printer/Copier (Large)	600	Yes		
STEM Building	8	Projector	240	Yes		
STEM Building	6	Refrigerator (Laboratories)	400	No		
STEM Building	9	Refrigerator (Mini)	112	Yes		
STEM Building	12	Refrigerator (Residential)	250	Yes		
STEM Building	6	Television	220	Yes		
STEM Building	4	Toaster	400	No		
STEM Building	2	Humidifier	55	No		
STEM Building	1	Commercial Coffee Machine	6,600	No		
STEM Building	3	Server closets	800	No		
STEM Building	3	Coffee Machine	400	No		
STEM Building	1	UPS (HPC Clusters)	40,000	No		

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.



LEARN MORE AT energystar.gov

ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

The College of New Jersey

Primary Property Type: College/University
Gross Floor Area (ft²): 2,830,421
Built: 1855

For Year Ending: January 31, 2020
Date Generated: December 13, 2020

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
The College of New Jersey 2000 Pennington Road Ewing, New Jersey 08628	The College of New Jersey 2000 Pennington Rd Ewing, NJ 08628 609-771-2874	David Matlack 2000 Pennington Road Ewing, NJ 08628 609-771-2874 sstewart@trccompanies.com

Property ID: 5984875

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
229 kBtu/ft²

Source EUI
258.3 kBtu/ft²

Annual Energy by Fuel		National Median Comparison	
Natural Gas (kBtu)	619,522,872 (96%)	National Median Site EUI (kBtu/ft²)	160.2
Electric - Grid (kBtu)	28,774,949 (4%)	National Median Source EUI (kBtu/ft²)	180.6
		% Diff from National Median Source EUI	43%
		Annual Emissions	
		Greenhouse Gas Emissions (Metric Tons CO2e/year)	35,660

Signature & Stamp of Verifying Professional

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

LP Signature: _____ Date: _____

Licensed Professional

____ _____
.
(___)___-____
_____

Professional Engineer or Registered Architect 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 gas* 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.
TREC	*Transition Incentive Renewable Energy Certificate:* a factorized renewable energy certificate 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.