Local Government Energy Audit Report

Green Brook Regional Center

October 17, 2023

Prepared for:

State of NJ Department of Human Services
275 Green Brook Road
Green Brook, New Jersey 08812

Prepared by:

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Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities and help prioritize specific measures for implementation. 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.

Incentive values provided in this report are estimated based on previously run state efficiency programs. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available utility program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

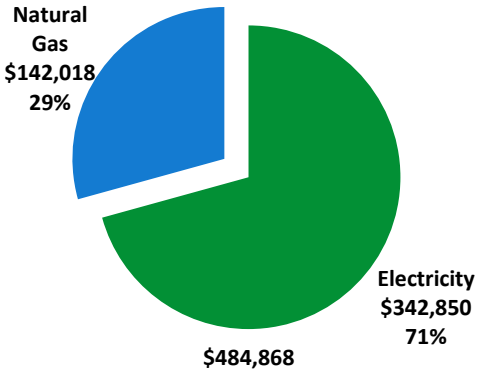
The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state, and federal requirements.

Table of Contents

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Green Brook Regional Center. 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: $484,868 Electricity: 2,443,998 kWh Natural Gas: 155,791 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.

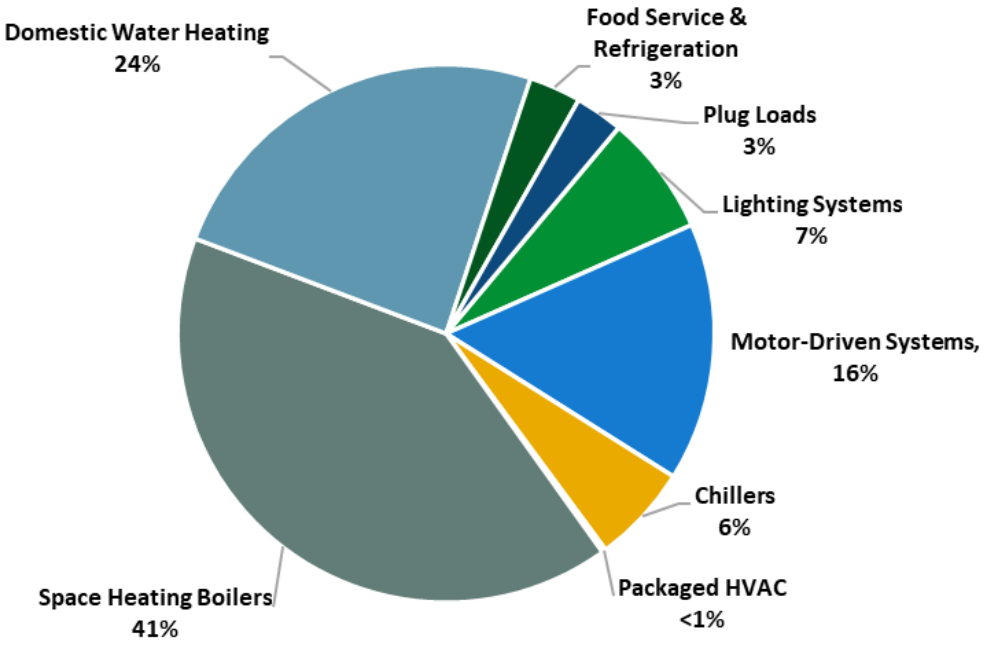


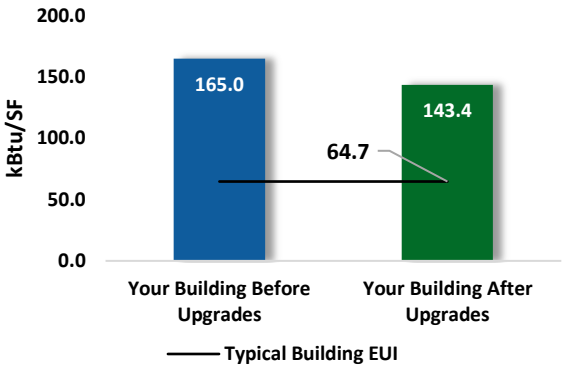
Figure 1 - Energy Use by System

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.

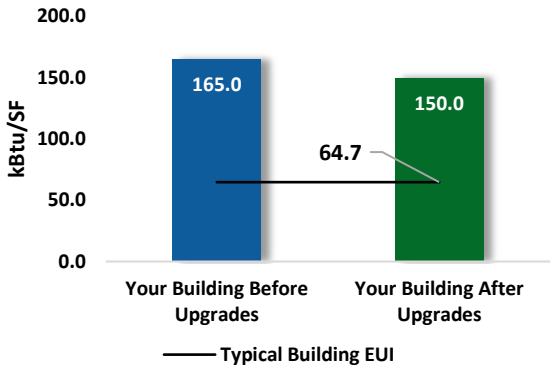
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$599,737
Potential Rebates & Incentives[1]	$48,082
Annual Cost Savings	$93,329
Annual Energy Savings	Electricity: 594,110 kWh Natural Gas: 10,954 Therms
Greenhouse Gas Emission Savings	363 Tons
Simple Payback	5.9 Years
Site Energy Savings (All Utilities)	13%



Scenario 2: Cost Effective Package[2]

Installation Cost	$315,363
Potential Rebates & Incentives	$47,097
Annual Cost Savings	$84,366
Annual Energy Savings	Electricity: 591,531 kWh Natural Gas: 1,518 Therms
Greenhouse Gas Emission Savings	307 Tons
Simple Payback	3.2 Years
Site Energy Savings (all utilities)	9%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	High

[1] Incentives are based on previously run state rebate programs. Contact your utility provider for current program incentives that 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			**258,066**	**54.3**	**-54**	**$35,706**	**$78,187**	**$12,336**	**$65,851**	**1.8**	**253,502**
ECM 1	Install LED Fixtures	Yes	2,313	0.0	0	$324	$2,223	$300	$1,923	5.9	2,329
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	190,224	34.8	-41	$26,316	$51,581	$5,752	$45,829	1.7	186,810
ECM 3	Retrofit Fixtures with LED Lamps	Yes	61,443	19.0	-13	$8,501	$23,079	$6,284	$16,795	2.0	60,349
ECM 4	Install LED Exit Signs	Yes	4,087	0.5	-1	$565	$1,303	$0	$1,303	2.3	4,014
Lighting Control Measures			**83,767**	**19.7**	**-18**	**$11,588**	**$67,627**	**$13,845**	**$53,782**	**4.6**	**82,264**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	83,767	19.7	-18	$11,588	$67,627	$13,845	$53,782	4.6	82,264
Variable Frequency Drive (VFD) Measures			**199,117**	**33.7**	**0**	**$27,933**	**$112,777**	**$14,900**	**$97,877**	**3.5**	**200,510**
ECM 6	Install VFDs on Chilled Water Pumps	Yes	74,693	12.6	0	$10,478	$29,246	$3,700	$25,546	2.4	75,216
ECM 7	Install VFDs on Heating Water Pumps	Yes	64,968	6.3	0	$9,114	$36,709	$4,800	$31,909	3.5	65,423
ECM 8	Install Boiler Draft Fan VFDs	Yes	18,668	4.9	0	$2,619	$13,185	$2,000	$11,185	4.3	18,799
ECM 9	Install VFDs on Boiler Feedwater Pumps	Yes	15,467	7.5	0	$2,170	$11,881	$2,000	$9,881	4.6	15,575
ECM 10	Install VFDs on Process Pumps	Yes	25,321	2.5	0	$3,552	$21,756	$2,400	$19,356	5.4	25,498
HVAC System Improvements			**0**	**0.0**	**16**	**$144**	**$266**	**$40**	**$226**	**1.6**	**1,855**
ECM 11	Install Pipe Insulation	Yes	0	0.0	16	$144	$266	$40	$226	1.6	1,855
Domestic Water Heating Upgrade			**278**	**0.0**	**1,152**	**$10,538**	**$278,672**	**$1,651**	**$277,021**	**26.3**	**135,136**
ECM 12	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	944	$8,601	$270,682	$0	$270,682	31.5	110,478
ECM 13	Install Low-Flow DHW Devices	Yes	278	0.0	208	$1,937	$7,991	$1,651	$6,340	3.3	24,658
Food Service & Refrigeration Measures			**52,881**	**5.8**	**0**	**$7,418**	**$62,208**	**$5,310**	**$56,898**	**7.7**	**53,251**
ECM 14	Refrigerator/Freezer Case Electrically Commutated Motors	No	264	0.0	0	$37	$2,730	$360	$2,370	64.1	265
ECM 15	Refrigeration Controls	No	2,315	0.0	0	$325	$10,963	$625	$10,338	31.8	2,331
ECM 16	Replace Refrigeration Equipment	Yes	48,348	5.5	0	$6,782	$48,055	$4,275	$43,780	6.5	48,687
ECM 17	Vending Machine Control	Yes	1,954	0.2	0	$274	$460	$50	$410	1.5	1,968
TOTALS (COST EFFECTIVE MEASURES)			**591,531**	**113.4**	**152**	**$84,366**	**$315,363**	**$47,097**	**$268,266**	**3.2**	**613,444**
TOTALS (ALL MEASURES)			**594,110**	**113.5**	**1,095**	**$93,329**	**$599,737**	**$48,082**	**$551,655**	**5.9**	**726,518**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

** - 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

Utility-run energy efficiency programs and 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.

Options from Your Utility Company

Prescriptive and Custom Rebates

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 Prescriptive and Custom Rebates 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 may be required for some incentives. Contact your utility company for more details prior to project installation.

Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized contractor. This program can provide incentives up to 70% or 80% of the cost of selected measures. A Direct Install contractor will assess and verify individual measure eligibility and perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Engineered Solutions

The Engineered Solutions program provides tailored energy-efficiency assistance and turnkey engineering services to municipalities, universities, schools, hospitals, and healthcare facilities (MUSH), non-profit entities, and multifamily buildings. The program provides all professional services from audit, design, construction administration, to commissioning and measurement and verification for custom whole-building energy-efficiency projects. Engineered Solutions 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.

For more details on these programs please contact your utility provider.

Options from New Jersey's Clean Energy Program

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 and Power (CHP)

The CHP program provides incentives for combined heat and power (i.e., 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.

Successor Solar Incentive Program (SuSI)

New Jersey is committed to supporting solar energy. Solar projects help the state reach the renewable goals outlined in the state's Energy Master Plan. The SuSI program is used to register and certify solar projects in New Jersey. Rebates are not available, but certified solar projects are able to earn one SREC II (Solar Renewable Energy Certificates II) for each megawatt-hour of solar electricity produced from a qualifying solar facility.

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.

Large Energy User Program (LEUP)

LEUP is designed to promote self-investment in energy efficiency. It incentivizes owners/users of buildings to upgrade or install energy conserving measures in existing buildings to help offset the capital costs associated with the project. The efficiency upgrades are customized to meet the requirements of the customers' existing facilities, while advancing the State's energy efficiency, conservation, and greenhouse gas reduction goals.

For more details on these programs please visit New Jersey's Clean Energy Program website .

2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Green Brook Regional Center. 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.

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 May 9, 2023, TRC performed an energy audit at Green Brook Regional Center located in Green Brook, New Jersey. TRC met with Ripen Nagar to review the facility operations and help focus our investigation on specific energy-using systems.

Green Brook Regional Center is a Medicaid Certified 105 Bed Intermediate Care Facility. The facility occupies a three-story, 145,000 square foot building built in 1964. Spaces include offices, living quarters, corridors, stairwells, senior center dining room, commercial kitchen, and basement mechanical space.

2.2 Building Occupancy

The facility is continuously occupied.

Building Name	Weekday/Weekend	Operating Schedule
Green Brook Regional Center	Weekday	12:00 AM - 12:00 AM
	Weekend	12:00 AM - 12:00 AM

Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

The walls are made of poured concrete with a painted CMU interior finish. The flat roof is supported with steel trusses and pre-stressed concrete deck and finished with a covering of modified bitumen.

Most of the windows are double glazed and have aluminum frames. The glass-to-frame seals are in fair condition. The operable window weather seals are in fair condition, showing some evidence of excessive wear. Exterior doors have aluminum frames and are in good condition with undamaged door seals. Degraded window and door seals increase drafts and outside air infiltration.

Front of Building

2.4 Lighting Systems

The interior lighting system consists of a variety of lamp and fixture types. Many fixtures use older, inefficient 40-Watt linear fluorescent T12 lamps. There are also several 32-Watt linear fluorescent T8 lamp fixtures. Fixture types include 1-lamp, 2-lamp, or 4-lamp, 4-foot or 8-foot long recessed and surface mounted fixtures and 2-foot fixtures with U-bend tube lamps. Typically, T8 fluorescent lamps use electronic ballasts and T12 fluorescent lamps use magnetic ballasts.

Some of the linear fixtures have been converted to operate LED tube lamps.

Additionally, there are a substantial quantity of relatively new LED fixtures. A few plug-in and screw-in compact fluorescent lamps (CFL), incandescent, and LED lamps are used mainly in service spaces.

Most exit signs are LED; however, there are a few incandescent units. Most fixtures are in good condition. Interior lighting levels were generally sufficient. Lighting fixtures are controlled by wall switches.

T12 U-Bend Fixtures

Exit Sign

Exterior fixtures include wall packs, floodlights, and canopy lights with high intensity discharge (HID), LED, and incandescent lamps. Exterior fixtures are timer and photocell controlled.

LED Canopy Fixture

HID Canopy Fixture

2.5 Air Handling Systems

Unit Ventilators

Unit ventilators serve second and third floor patient rooms and several restrooms. They are equipped with supply fan motors and pneumatically controlled outside air dampers and fan coil valves connected to the chilled and hot water distribution system. They provide heating, cooling, and ventilation and appear to be in fair operating condition.

Unitary Electric HVAC Equipment

Some areas are cooled by window or through-the wall air conditioning (AC) units. These vary in capacity between 1 and 2 tons. The units are in good condition. They range in efficiency between 11 EER to 12 EER. They are not ENERGY STAR® labeled.

There are also four split air-source heat pump (HP) systems, each with a cooling capacity of 1.5 tons. Two are Mitsubishi units each with a heating capacity of about 18 MBh and an estimated heating seasonal performance factor (HSPF) of 12.5; the others are Daiken units each with a heating capacity of 21.6 MBh and a heating seasonal performance factor (HSPF) of 11.0. They are all operating within their useful life.

Window AC Unit

Outdoor Condensing Unit

Air Handling Units (AHUs)

The facility is conditioned by multiple air-handling units, each equipped with a supply fan, chilled, and hot water coil. AHUs are located within several mechanical rooms and were accessible during the audit.

The supply fan motors range from 0.8 hp to 5 hp, are standard efficiency, and are operated at constant speed. Cooling is provided by chilled water produced by the chiller plant. The heating side of these systems is described in in the following section.

Typical AHU

2.6 Steam to Hot Water Heating Systems

Two Cyclonetic 7,168 MBh steam boilers serve the building's heating load at a nominal efficiency of 80 percent. Each boiler is equipped with a 7.5-hp boiler feed pump and a combustion air fan. The boilers are configured in a lead-lag control scheme and are in poor condition.

Steam is converted to hot water with the help of a heat exchanger, and hot water is distributed to heating end uses. The boilers are configured in a constant flow primary distribution with four, 15-hp constant speed hot water pumps operating with a manual control scheme.

The heat exchangers provide hot water to unit ventilators and air handling units throughout the building.

Steam Boiler

2.7 Chilled Water Systems

The facility has two chillers but at the time of the site visit only one chiller was operational. The analysis in the report focuses on the chiller that is working. If the facility is considering replacing the chiller that is down, they may also want to consider replacing the other chiller at the same time since staff reported that the compressor has been rebuilt twice in the past five years.

The chiller plant consists of a 272-ton water cooled chiller. The chilled water distribution loop is equipped with a variable speed 40-hp pump and a constant speed 20-hp pump.

The condenser water system consists of a cooling tower equipped with a fan motor estimated at 15-hp. Condenser water is supplied to the chillers by two, 15-hp constant flow pumps.

Water Cooled Chiller

Cooling Tower

2.8 Domestic Hot Water

Most of the hot water is produced indirectly by two, 1,900 MBh semi-instantaneous steam to water heat exchangers. Two, 0.1 hp circulation pumps distribute water to end uses. The circulation pumps operate continuously. The domestic hot water pipes are partially insulated, and the insulation is in fair condition.

A portion of the hot water is produced by a 19-gallon, 1.5 kW electric storage water heater.

Heat Exchanger

Storage Water Heater

2.9 Food Service Equipment

The kitchen has a mix of gas and electric equipment that is used to prepare meals for residents and staff. Most cooking is done using a gas-fired convection oven. Bulk prepared foods are held in an electric holding cabinet. Equipment is not high efficiency and is in fair condition.

The dishwasher is a non-ENERGY STAR® low-temperature, conveyor-type unit.

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

Insulated Food Holding Cabinet

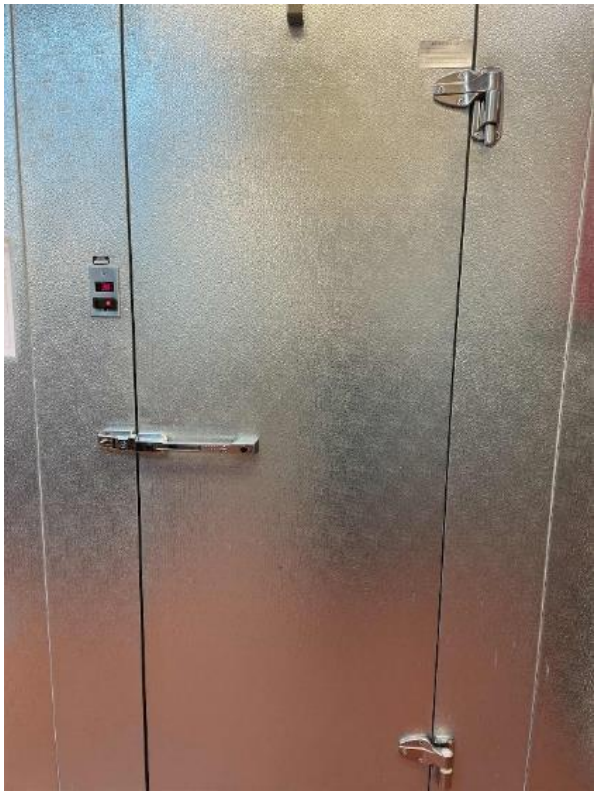
2.10 Refrigeration

The kitchen has one stand-up refrigerator with solid doors. There are also several stand-up solid door freezers. There is a freezer chest as well as a refrigerator chest. All equipment is standard and in good condition.

The walk-in refrigerator has an estimated 0.5-ton compressor located in the kitchen and an estimated 10-Watt fan evaporator.

There are multiple walk-in medium temperature freezers that each have a 1-ton compressor located in the kitchen. Each has two evaporator fans estimated at 10-Watt each.

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



Walk-In Freezer

2.11 Plug Load and Vending Machines

The location is doing a great job managing the electrical plug loads. This report makes additional suggestions for ECMs in this area as well as energy efficient best practices.

There are approximately 100 computer workstations throughout the facility. Plug loads include general cafe and office equipment.

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

There is one refrigerated beverage vending machine and one non-refrigerated vending machine. Vending machines are not equipped with occupancy-based controls.

Large Printer

Refrigerated Vending Machine

2.12 Water-Using Systems

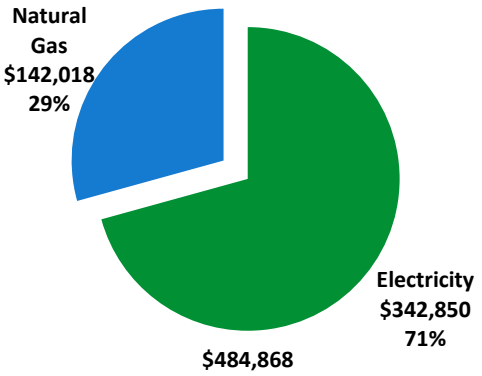
There are over 100 restrooms with toilets, urinals, and sinks. Faucet flow rates are at 2.2 gallons per minute (gpm) or higher. There are several restrooms with showers, and showerheads are rated at 2.2 gpm.

Restroom Faucet

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	2,443,998 kWh	$342,850
Natural Gas	155,791 Therms	$142,018
Total		**$484,868**



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.

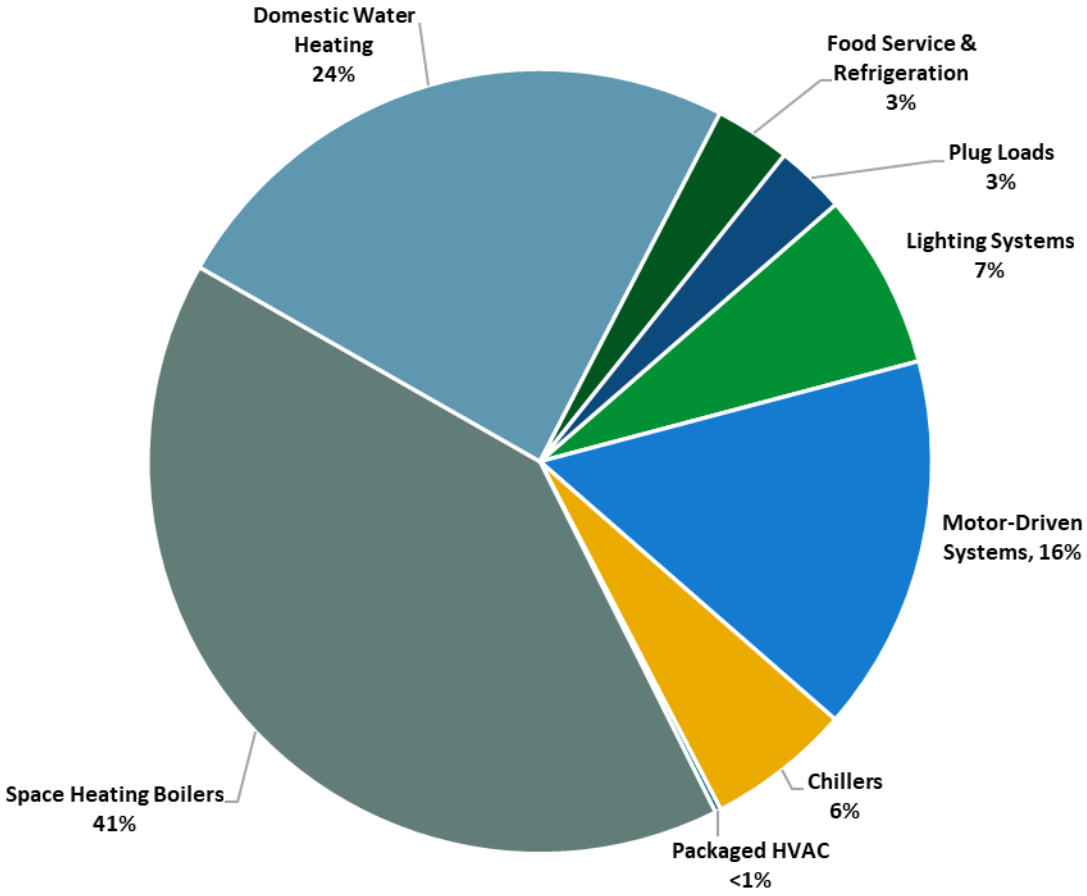
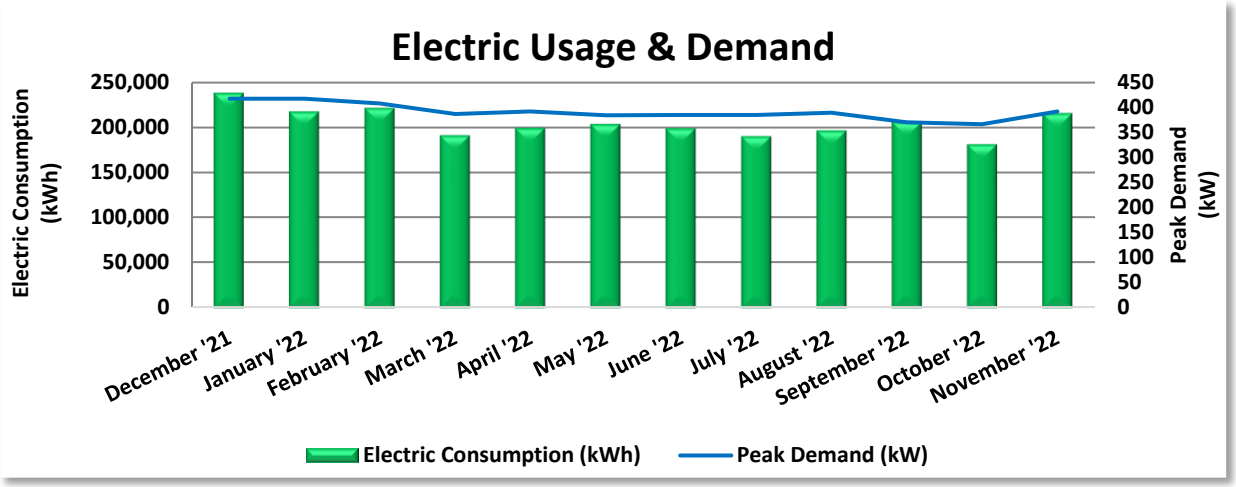


Figure 4 - Energy Balance

3.1 Electricity

PSE&G delivers electricity under rate class Large Power & Lighting Secondary (LPLS), with electric production provided by Direct Energy, a third-party supplier.



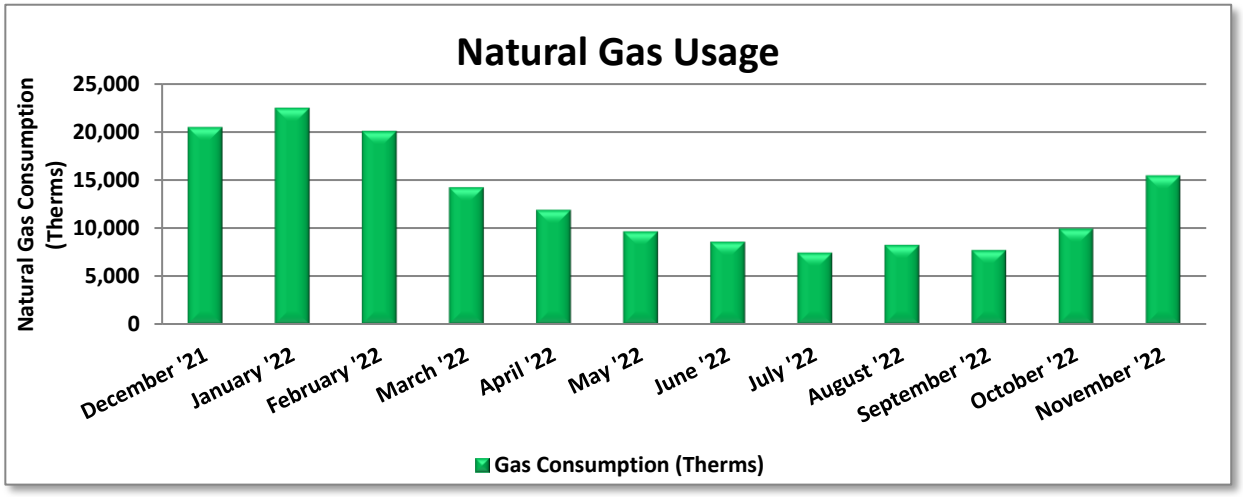
Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
1/5/22	33	237,900	418	$1,582	$31,572
2/3/22	29	217,269	418	$1,582	$29,003
3/7/22	32	221,072	408	$1,544	$29,432
4/5/22	29	190,880	387	$1,464	$25,593
5/5/22	30	199,293	392	$1,484	$26,663
6/6/22	32	203,270	385	$4,926	$30,612
7/6/22	30	198,792	385	$5,152	$30,366
8/4/22	29	189,874	385	$5,219	$29,351
9/2/22	29	196,403	390	$5,281	$30,231
10/4/22	32	205,994	370	$1,655	$27,824
11/2/22	29	181,031	367	$1,638	$24,807
12/5/22	33	215,612	392	$1,751	$29,276
Totals	**367**	**2,457,390**	**418**	**$33,278**	**$344,729**
Annual	**365**	**2,443,998**	**418**	**$33,096**	**$342,850**

Notes:

- Peak demand of 418 kW occurred in December '21.
- Average demand over the past 12 months was 391 kW.
- The average electric cost over the past 12 months was $0.140/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

PSE&G delivers natural gas under rate class General Gas Service, with natural gas supply provided by UGI, a third-party supplier.



Gas Billing Data			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
1/14/22	31	20,429	$17,800
2/14/22	31	22,410	$22,173
3/16/22	30	20,024	$20,073
4/14/22	29	14,183	$11,746
5/16/22	32	11,853	$9,742
6/16/22	31	9,631	$7,579
7/15/22	29	8,549	$6,486
8/15/22	31	7,432	$5,958
9/14/22	30	8,238	$6,577
10/13/22	29	7,682	$6,143
11/13/22	31	9,924	$11,528
12/14/22	31	15,437	$16,213
Totals	**365**	**155,791**	**$142,018**
Annual	**365**	**155,791**	**$142,018**

Notes:

- The average gas cost for the past 12 months is $0.912/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.

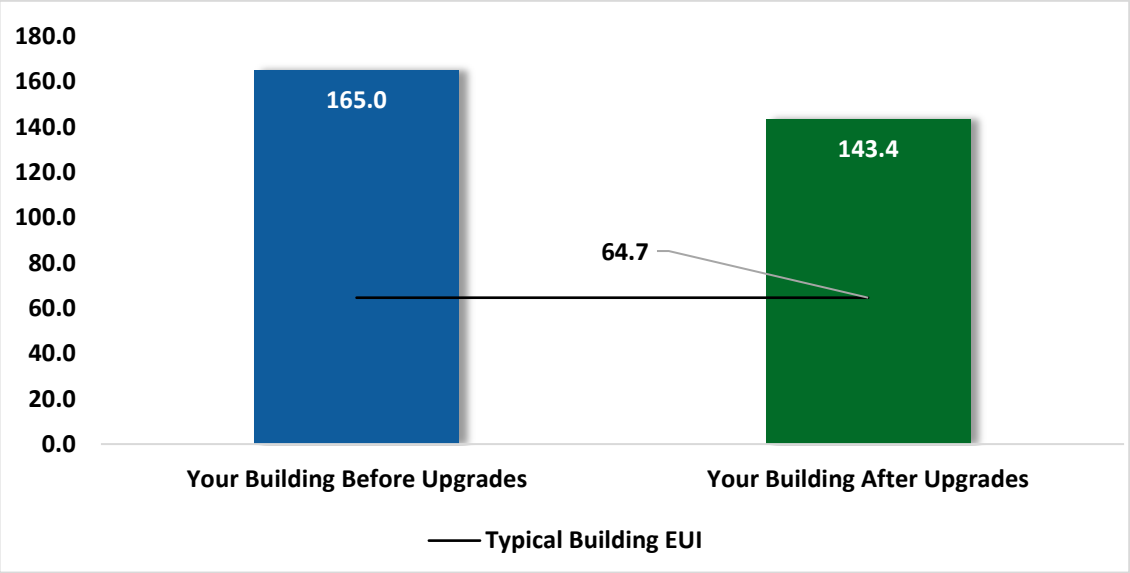


Figure 5 - Energy Use Intensity Comparison[3]

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. Several factors can cause a building to vary from 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.

[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 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 Energy Conservation Measures

The goal of this audit report is to identify and evaluate potential energy efficiency improvements and provide information about the cost effectiveness of those improvements. Most energy conservation measures have received preliminary analysis of feasibility, which identifies expected ranges of savings. 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 in this report are based on the previously run state rebate program SmartStart, which has been retired. Now, all investor-owned gas and electric utility companies are offering complementary energy efficiency programs directly to their customers. Some measures and proposed upgrades may be eligible for higher incentives than those shown below. The incentives in the summary tables should be used for high-level planning purposes. To verify incentives, reach out to your utility provider or visit the NJCEP website for more information.

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			**258,066**	**54.3**	**-54**	**$35,706**	**$78,187**	**$12,336**	**$65,851**	**1.8**	**253,502**
ECM 1	Install LED Fixtures	Yes	2,313	0.0	0	$324	$2,223	$300	$1,923	5.9	2,329
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	190,224	34.8	-41	$26,316	$51,581	$5,752	$45,829	1.7	186,810
ECM 3	Retrofit Fixtures with LED Lamps	Yes	61,443	19.0	-13	$8,501	$23,079	$6,284	$16,795	2.0	60,349
ECM 4	Install LED Exit Signs	Yes	4,087	0.5	-1	$565	$1,303	$0	$1,303	2.3	4,014
Lighting Control Measures			**83,767**	**19.7**	**-18**	**$11,588**	**$67,627**	**$13,845**	**$53,782**	**4.6**	**82,264**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	83,767	19.7	-18	$11,588	$67,627	$13,845	$53,782	4.6	82,264
Variable Frequency Drive (VFD) Measures			**199,117**	**33.7**	**0**	**$27,933**	**$112,777**	**$14,900**	**$97,877**	**3.5**	**200,510**
ECM 6	Install VFDs on Chilled Water Pumps	Yes	74,693	12.6	0	$10,478	$29,246	$3,700	$25,546	2.4	75,216
ECM 7	Install VFDs on Heating Water Pumps	Yes	64,968	6.3	0	$9,114	$36,709	$4,800	$31,909	3.5	65,423
ECM 8	Install Boiler Draft Fan VFDs	Yes	18,668	4.9	0	$2,619	$13,185	$2,000	$11,185	4.3	18,799
ECM 9	Install VFDs on Boiler Feedwater Pumps	Yes	15,467	7.5	0	$2,170	$11,881	$2,000	$9,881	4.6	15,575
ECM 10	Install VFDs on Process Pumps	Yes	25,321	2.5	0	$3,552	$21,756	$2,400	$19,356	5.4	25,498
HVAC System Improvements			**0**	**0.0**	**16**	**$144**	**$266**	**$40**	**$226**	**1.6**	**1,855**
ECM 11	Install Pipe Insulation	Yes	0	0.0	16	$144	$266	$40	$226	1.6	1,855
Domestic Water Heating Upgrade			**278**	**0.0**	**1,152**	**$10,538**	**$278,672**	**$1,651**	**$277,021**	**26.3**	**135,136**
ECM 12	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	944	$8,601	$270,682	$0	$270,682	31.5	110,478
ECM 13	Install Low-Flow DHW Devices	Yes	278	0.0	208	$1,937	$7,991	$1,651	$6,340	3.3	24,658
Food Service & Refrigeration Measures			**52,881**	**5.8**	**0**	**$7,418**	**$62,208**	**$5,310**	**$56,898**	**7.7**	**53,251**
ECM 14	Refrigerator/Freezer Case Electrically Commutated Motors	No	264	0.0	0	$37	$2,730	$360	$2,370	64.1	265
ECM 15	Refrigeration Controls	No	2,315	0.0	0	$325	$10,963	$625	$10,338	31.8	2,331
ECM 16	Replace Refrigeration Equipment	Yes	48,348	5.5	0	$6,782	$48,055	$4,275	$43,780	6.5	48,687
ECM 17	Vending Machine Control	Yes	1,954	0.2	0	$274	$460	$50	$410	1.5	1,968
TOTALS			**594,110**	**113.5**	**1,095**	**$93,329**	**$599,737**	**$48,082**	**$551,655**	**5.9**	**726,518**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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

Figure 6 – All Evaluated ECMs

#	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		**258,066**	**54.3**	**-54**	**$35,706**	**$78,187**	**$12,336**	**$65,851**	**1.8**	**253,502**
ECM 1	Install LED Fixtures	2,313	0.0	0	$324	$2,223	$300	$1,923	5.9	2,329
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	190,224	34.8	-41	$26,316	$51,581	$5,752	$45,829	1.7	186,810
ECM 3	Retrofit Fixtures with LED Lamps	61,443	19.0	-13	$8,501	$23,079	$6,284	$16,795	2.0	60,349
ECM 4	Install LED Exit Signs	4,087	0.5	-1	$565	$1,303	$0	$1,303	2.3	4,014
Lighting Control Measures		**83,767**	**19.7**	**-18**	**$11,588**	**$67,627**	**$13,845**	**$53,782**	**4.6**	**82,264**
ECM 5	Install Occupancy Sensor Lighting Controls	83,767	19.7	-18	$11,588	$67,627	$13,845	$53,782	4.6	82,264
Variable Frequency Drive (VFD) Measures		**199,117**	**33.7**	**0**	**$27,933**	**$112,777**	**$14,900**	**$97,877**	**3.5**	**200,510**
ECM 6	Install VFDs on Chilled Water Pumps	74,693	12.6	0	$10,478	$29,246	$3,700	$25,546	2.4	75,216
ECM 7	Install VFDs on Heating Water Pumps	64,968	6.3	0	$9,114	$36,709	$4,800	$31,909	3.5	65,423
ECM 8	Install Boiler Draft Fan VFDs	18,668	4.9	0	$2,619	$13,185	$2,000	$11,185	4.3	18,799
ECM 9	Install VFDs on Boiler Feedwater Pumps	15,467	7.5	0	$2,170	$11,881	$2,000	$9,881	4.6	15,575
ECM 10	Install VFDs on Process Pumps	25,321	2.5	0	$3,552	$21,756	$2,400	$19,356	5.4	25,498
HVAC System Improvements		**0**	**0.0**	**16**	**$144**	**$266**	**$40**	**$226**	**1.6**	**1,855**
ECM 11	Install Pipe Insulation	0	0.0	16	$144	$266	$40	$226	1.6	1,855
Domestic Water Heating Upgrade		**278**	**0.0**	**208**	**$1,937**	**$7,991**	**$1,651**	**$6,340**	**3.3**	**24,658**
ECM 13	Install Low-Flow DHW Devices	278	0.0	208	$1,937	$7,991	$1,651	$6,340	3.3	24,658
Food Service & Refrigeration Measures		**50,303**	**5.7**	**0**	**$7,057**	**$48,515**	**$4,325**	**$44,190**	**6.3**	**50,655**
ECM 16	Replace Refrigeration Equipment	48,348	5.5	0	$6,782	$48,055	$4,275	$43,780	6.5	48,687
ECM 17	Vending Machine Control	1,954	0.2	0	$274	$460	$50	$410	1.5	1,968
TOTALS		**591,531**	**113.4**	**152**	**$84,366**	**$315,363**	**$47,097**	**$268,266**	**3.2**	**613,444**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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

Figure 7 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**258,066**	**54.3**	**-54**	**$35,706**	**$78,187**	**$12,336**	**$65,851**	**1.8**	**253,502**
ECM 1	Install LED Fixtures	2,313	0.0	0	$324	$2,223	$300	$1,923	5.9	2,329
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	190,224	34.8	-41	$26,316	$51,581	$5,752	$45,829	1.7	186,810
ECM 3	Retrofit Fixtures with LED Lamps	61,443	19.0	-13	$8,501	$23,079	$6,284	$16,795	2.0	60,349
ECM 4	Install LED Exit Signs	4,087	0.5	-1	$565	$1,303	$0	$1,303	2.3	4,014

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 is proposed, we suggest converting all of a specific lighting type (e.g., linear fluorescent) to LED lamps to minimize the number of lamp types in use at the facility, which should help reduce future maintenance costs.

ECM 1: Install LED Fixtures

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

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

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

Affected Building Areas: exterior HPS fixtures

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

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

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

Affected Building Areas: all areas with fluorescent fixtures with T12 tubes

ECM 3: Retrofit Fixtures with LED Lamps

Replace fluorescent or incandescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as a direct replacement for most other lighting technologies. Be sure to specify replacement lamps that are compatible with existing dimming controls, where applicable. In some circumstances, you may need to upgrade your dimming system for optimum performance.

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, T5 lamps, CFLs, and incandescent bulbs

ECM 4: Install LED Exit Signs

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

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**83,767**	**19.7**	**-18**	**$11,588**	**$67,627**	**$13,845**	**$53,782**	**4.6**	**82,264**
ECM 5	Install Occupancy Sensor Lighting Controls	83,767	19.7	-18	$11,588	$67,627	$13,845	$53,782	4.6	82,264

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

ECM 5: Install Occupancy Sensor Lighting Controls

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

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

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

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

Affected Building Areas: offices, lounges, patient rooms, corridors, restrooms, mechanical spaces, and storage rooms

4.3 Variable Frequency Drives (VFD)

#	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)
Variable Frequency Drive (VFD) Measures			**199,117**	**33.7**	**0**	**$27,933**	**$112,777**	**$14,900**	**$97,877**	**3.5**	**200,510**
ECM 6	Install VFDs on Chilled Water Pumps	Yes	74,693	12.6	0	$10,478	$29,246	$3,700	$25,546	2.4	75,216
ECM 7	Install VFDs on Heating Water Pumps	Yes	64,968	6.3	0	$9,114	$36,709	$4,800	$31,909	3.5	65,423
ECM 8	Install Boiler Draft Fan VFDs	Yes	18,668	4.9	0	$2,619	$13,185	$2,000	$11,185	4.3	18,799
ECM 9	Install VFDs on Boiler Feedwater Pumps	Yes	15,467	7.5	0	$2,170	$11,881	$2,000	$9,881	4.6	15,575
ECM 10	Install VFDs on Process Pumps	Yes	25,321	2.5	0	$3,552	$21,756	$2,400	$19,356	5.4	25,498

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

ECM 6: Install VFDs on Chilled Water Pumps

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

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

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

ECM 7: Install VFDs on Heating Water Pumps

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

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

ECM 8: Install Boiler Draft Fan VFDs

Replace existing volume control devices on boiler draft fans, such as inlet vanes or dampers, with VFDs. Inlet vanes or dampers are an inefficient means of controlling the air volume compared to VFDs. The existing volume control device will be removed or permanently disabled, and the control signal will be redirected to the VFD to determine proper fan motor speed.

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

Additional maintenance savings may result from this measure. VFDs are solid state electronic devices, which generally require less maintenance than mechanical air volume control devices.

ECM 9: Install VFDs on Boiler Feedwater Pumps

Install VFDs to control boiler feedwater pumps. The existing level control valve will need to be maintained fully open and its control signal used by the VFD to modulate the feedwater speed.

Energy savings result from reducing the pump motor speed (and power) at reduced feedwater flow. The magnitude of energy savings is based on the estimated amount of time that the pumping system will operate at reduced load.

ECM 10: Install VFDs on Process Pumps

Install VFDs to control process pumps. Process flow requirements vary considerably based on the requirements of the process. For example, pool filtration requirements may be linked to pool occupancy, in which case high- and low-speed operation may be all that is required. In some cases, sensors will be required to optimize flow. Other pumping applications may require water level or other sensing devices to optimize pump operations. If the system has fixed head requirements (e.g., well pumps or open systems with an elevated tank or pond) the pump speed will have to be controlled to maintain the minimum fixed head requirement for the system.

Energy savings result from reducing the pump speed during low demand periods. Ensure that your control system includes the sensors and inputs required to optimize water flow in your water supply.

Affected Building Systems: deaerator system (two, 10 hp pumps) and drain pumps (two, 2 hp pumps)

4.4 HVAC Improvements

#	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)
HVAC System Improvements		**0**	**0.0**	**16**	**$144**	**$266**	**$40**	**$226**	**1.6**	**1,855**
ECM 11	Install Pipe Insulation	0	0.0	16	$144	$266	$40	$226	1.6	1,855

ECM 11: Install Pipe Insulation

Install insulation on domestic hot water system piping. Distribution system losses are dependent on system fluid temperature, the size of the distribution system, and the level of insulation of the piping. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is exposed to water, when the insulation has been removed from some areas of the pipe, or when valves have not been properly insulated system efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

Affected Systems: main domestic hot water piping

4.5 Domestic Water Heating

#	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)
Domestic Water Heating Upgrade		**278**	**0.0**	**1,152**	**$10,538**	**$278,672**	**$1,651**	**$277,021**	**26.3**	**135,136**
ECM 12	Install High Efficiency Gas-Fired Water Heater	0	0.0	944	$8,601	$270,682	$0	$270,682	31.5	110,478
ECM 13	Install Low-Flow DHW Devices	278	0.0	208	$1,937	$7,991	$1,651	$6,340	3.3	24,658

ECM 12: Install High Efficiency Gas-Fired Water Heater

We evaluated replacing the indirect semi-instantaneous water heater with a high efficiency condensing tank water heater. Energy savings result from the increased efficiency of the unit, which uses less gas to heat water, and fewer operating hours to maintain the tank water temperature.

ECM 13: Install Low-Flow DHW Devices

Install low-flow devices to reduce overall hot water demand. The following low-flow devices are recommended to reduce hot water usage:

Device	Flow Rate
Faucet aerators (lavatory)	0.5 gpm
Faucet aerator (kitchen)	1.5 gpm
Showerhead	2.0 gpm

Low-flow devices reduce the overall water flow from the fixture, while still providing adequate pressure for washing. This measure applies to staff, public, and patient restrooms, kitchen & shower facilities.

Additional cost savings may result from reduced water usage.

4.6 Food Service & Refrigeration Measures

#	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)
Food Service & Refrigeration Measures		**52,881**	**5.8**	**0**	**$7,418**	**$62,208**	**$5,310**	**$56,898**	**7.7**	**53,251**
ECM 14	Refrigerator/Freezer Case Electrically Commutated Motors	264	0.0	0	$37	$2,730	$360	$2,370	64.1	265
ECM 15	Refrigeration Controls	2,315	0.0	0	$325	$10,963	$625	$10,338	31.8	2,331
ECM 16	Replace Refrigeration Equipment	48,348	5.5	0	$6,782	$48,055	$4,275	$43,780	6.5	48,687
ECM 17	Vending Machine Control	1,954	0.2	0	$274	$460	$50	$410	1.5	1,968

ECM 14: Refrigerator/Freezer Case Electrically Commutated Motors

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

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

ECM 15: Refrigeration Controls

We evaluated installing additional controls to optimize the operation of walk-in coolers and freezers.

Many walk-in coolers and freezers have continuously operating electric heaters on the doors to prevent condensation formation. This measure adds a control system feature to shut off the door heaters when the humidity level is low enough that condensation will not occur if the heaters are off. This is done by measuring the ambient humidity and temperature of the store, comparing that to the dewpoint, and using pulse width modulation to control the anti-sweat door heaters.

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

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

Novelty coolers often run continuously. This measure adds a control system feature to automatically shut off novelty coolers based on pre-set store operating hours. Based on programmed hours, the control mechanism shuts off the cooler at the end of business and then begins operation on reduced cycles. Regular compressor operation begins the following day an hour before the start of business.

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

ECM 16: Replace Refrigeration Equipment

Replace existing commercial refrigerators, freezers, and ice makers with new ENERGY STAR rated equipment. The energy savings associated with this measure come from reduced energy usage, due to more efficient technology, and reduced run times.

ECM 17: Vending Machine Control

Vending machines operate continuously, even during unoccupied hours. Install occupancy sensor controls to reduce energy use. These controls power down vending machines when the vending machine area has been vacant for some time, and they power up the machines at necessary regular intervals or when the surrounding area is occupied. Energy savings are dependent on the vending machine and activity level in the area surrounding the machines.

4.7 Measures for Future Consideration

There are additional opportunities for improvement that State of NJ Department of Human Services may wish to consider. These potential upgrades typically require further analysis, involve substantial capital investment, and/or include significant system reconfiguration. These measure(s) are therefore beyond the scope of this energy audit. These measure(s) are described here to support a whole building approach to energy efficiency and sustainability.

State of NJ Department of Human Services may wish to consider the Energy Savings Improvement Program (ESIP) or other whole building approach. With interest in implementing comprehensive, largescale and/or complex system wide projects, these measures may be pursued during development of a future energy savings plan. We recommend that you work with your energy service company (ESCO) and/or design team to:

- Evaluate these measures further.
- Develop firm costs.
- Determine measure savings.
- Prepare detailed implementation plans.

Other modernization or capital improvement funds may be leveraged for these types of refurbishments. As you plan for capital upgrades, be sure to consider the energy impact of the building systems and controls being specified.

Heating System Conversion from Steam to Hot Water

Replacing the steam boilers and heat exchangers with natural gas fired, high-efficiency water boilers was of interest to facility personnel. This type of system upgrade/conversion has significant up-front capital costs. However, there are benefits with modular hot water boiler system designs with advanced control strategies. Advantages associated with configuring a boiler plant around several modular boilers include the better system performance at low load conditions, and the modular boilers will often take less space than multiple old large boilers.

As the existing boilers are approaching the end of their useful life, it is recommended that reconfiguring the boiler plant be further evaluated. We recommend that you work with your mechanical design team to select boilers that are sized appropriately for the heating load.

Replacing the boilers has a long payback, and it may not be justifiable based simply on energy considerations. However, the boilers are nearing the end of their normal useful life. We also recommend working with your mechanical design team to determine whether a hot water heating system can operate with return water temperatures below 130°F, which would allow for operating condensing boilers at efficiencies above 90%. Energy savings results from improved combustion efficiency and reduced standby losses at low loads. The indirect hot water system would also need to be replaced, which would result in additional savings. Any processed steam requirements should be assessed as part of project development.

Further analysis should be conducted for the feasibility of this measure. This measure is a capital improvement measure for future consideration.

Installation of a Building Automation System

Most larger facilities have some type of building automation system (BAS), which provides for centralization, remote control, and monitoring of HVAC equipment and sometimes lighting or other building systems. A BAS utilizes a system of temperature and pressure sensors that obtain feedback about field conditions and provide signals to control systems that adjust HVAC system operation for optimal functioning. Thirty years ago, most control systems were pneumatic systems driven by compressed air, with pneumatic thermostats and air driven actuators for valves and dampers. Pneumatics controls have largely been replaced by direct digital control (DDC) systems, but many pneumatic systems remain. Contemporary DDC systems afford tighter controls and enhanced monitoring and trending capabilities as compared to the older systems.

Often smaller facilities are not equipped with central controls. For many small sites, it has been less costly to install distributed local controls, such as programmable thermostats and timeclocks, rather than centralized DDC. Local controls do a reasonably good job of scheduling equipment and maintaining operating conditions by relying on controls integral to HVAC units, such as logic for compressor staging, to manage the equipment operating algorithms.

Even for smaller sites, inefficiencies arise when temperature sensors and thermostat schedules are not maintained, when there are separate systems for heating and cooling, and especially when equipment is added, or the facility is reconfigured or repurposed.

Based on our survey, it appears that the installation of a BAS at your site could increase the efficiency of your building HVAC system operation.

A controls upgrade would enable automated equipment start and stop times, temperature setpoints, and lockouts and deadbands to be programmed remotely using a graphic interface. Controls can be configured to optimize ventilation and outside air intake by adjusting economizer position, damper function, and fan speed. Existing chilled and hot water distribution system controls are typically tied in, including associated pumps and valves. Coordinated control of HVAC systems is dependent on a network of sensors and status points. A comprehensive building control system provides monitoring and control for all HVAC systems, so operators can adjust system programming for optimal comfort and energy savings.

It is recommended that an HVAC engineer or contractor who specializes in BAS be contacted for a detailed evaluation and implementation costs. For the purposes of this report, the potential energy savings and measure costs were estimated based on industry standards and previous project experience. Further analysis should be conducted for the feasibility of this measure. This is not an investment grade analysis nor should be used as a basis for design and construction.

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 5% –20% 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, and planned capital upgrades, and it 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 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 cannot manage what you do not 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[4]. Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Weatherization

Caulk or weather strip leaky doors and windows to reduce drafts and loss of heated or cooled air. Sealing cracks and openings can reduce heating and cooling costs, improve building durability, and create a healthier indoor environment. Materials used may include caulk, polyurethane foam, and other weather-stripping materials. There is an energy savings opportunity by reducing the uncontrolled air exchange between the outside and inside of the building. Blower door assisted comprehensive building air sealing will reduce the amount of air exchange, which will in turn reduce the load on the buildings heating and cooling equipment, providing energy savings and increased occupant comfort.

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 can lead to increased occupant comfort as well as heating and cooling savings, especially when combined with proper HVAC controls and adequate ventilation.

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

Window Treatments/Coverings

Use high-reflectivity films or cover windows with shades or shutters to reduce solar heat gain and reduce the load on cooling and heating systems. Older, single-pane windows and east- or west-facing windows are especially prone to solar heat gain. In addition, use shades or shutters at night during cold weather to reduce heat loss.

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.

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 Controls

Electric motors often run unnecessarily, and this is an overlooked opportunity to save energy. These motors should be identified and turned off when appropriate. For example, exhaust fans often run unnecessarily when ventilation requirements are already met. Whenever possible, use automatic devices such as twist timers or occupancy sensors to turn off motors when they are not needed.

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.

Fans to Reduce Cooling Load

Install ceiling fans to supplement your cooling system. Thermostat settings can typically be increased by 4°F with no change in overall occupant comfort due to the wind chill effect of moving air.

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°F-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.

Chiller Maintenance

Service chillers regularly to keep them operating properly. Chillers are responsible for a substantial portion of a commercial building's overall energy usage, and when they do not work well, there is usually a noticeable increase in energy bills and increased occupant complaints. Regular diagnostics and service can save 5% to 10% of the cost of operating your chiller. If you already have a maintenance contract in place, your existing service company should be able to provide these services.

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.

Ductwork Maintenance

Duct maintenance has two primary goals: keep the ducts clean to avoid air quality problems and seal leaks to save energy. Check for cleanliness, obstructions that block airflow, water damage, and leaks. Ducts should be inspected at least every two years.

The biggest symptoms of clogged air ducts are differing temperatures throughout the building and areas with limited airflow from supply registers. If a particular air duct is clogged, then air flow will only be cut off to some rooms in the building—not all of them. The reduced airflow will make it more difficult for those areas to reach the temperature setpoint, which will cause the HVAC system to run longer to cool or heat that area properly. If you suspect clogged air ducts, ensure that all areas in front of supply registers are clear of items that may block or restrict air flow, and you should check for fire dampers or balancing dampers that have failed closed.

Duct leakage in commercial buildings can account for 5%–25% of the supply airflow. In the case of rooftop air handlers, duct leakage can occur to the outside of the building wasting conditioned air. Check ductwork for leakage. Eliminating duct leaks can improve ventilation system performance and reduce heating and cooling system operation.

Distribution system losses are dependent on-air system temperature, the size of the distribution system, and the level of insulation of the ductwork. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is missing or worn, the system efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

Boiler Maintenance

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

Label HVAC Equipment

For improved coordination in maintenance practices, we recommend labeling or re-labeling the site HVAC equipment. Maintain continuity in labeling by following labeling conventions as indicated in the facility drawings or BAS building equipment list. Use weatherproof or heatproof labeling or stickers for permanence, but do not cover over original equipment nameplates, which should be kept clean and readable whenever possible. Besides equipment, label piping for service and direction of flow when possible. Ideally, maintain a log of HVAC equipment, including nameplate information, asset tag designation, areas served, installation year, service dates, and other pertinent information.

This investment in your equipment will enhance collaboration and communication between your staff and your contracted service providers and may help you with regulatory compliance.

Optimize HVAC Equipment Schedules

Energy management systems (BAS) typically provide advanced controls for building HVAC systems, including chillers, boilers, air handling units, rooftop units and exhaust fans. The BAS monitors and reports operational status, schedules equipment start and stop times, locks out equipment operation based on outside air or space temperature, and often optimizes damper and valve operation based on complex algorithms. These BAS features, when in proper adjustment, can improve comfort for building occupants and save substantial energy.

Know your BAS scheduling capabilities. Regularly monitor HVAC equipment operating schedules and match them to building operating hours in order to eliminate unnecessary equipment operation and save energy. Monitoring should be performed often at sites with frequently changing usage patterns – daily in some cases. We recommend using the *optimal start* feature of the BAS (if available) to optimize the building warmup sequence. Most BAS scheduling programs provide for holiday schedules, which can be used during reduced use or shutdown periods. Finally, many systems are equipped with a one-time override function, which can be used to provide additional space conditioning due to a one-time, special event. When available this override feature should be used rather than changing the base operating schedule.

Water Heater Maintenance

The lower the supply water temperature that is used for hand washing sinks, the less energy is needed to heat the water. Reducing the temperature results in energy savings and the change is often unnoticeable to users. Be sure to review the domestic water temperature requirements for sterilizers and dishwashers as you investigate reducing the supply water temperature.

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

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

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.
- Reduce pressure setting to minimum needed for air operated equipment.
- Turn off compressor if not routinely needed.
- Use low pressure blower air rather than high pressure compressed air.

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

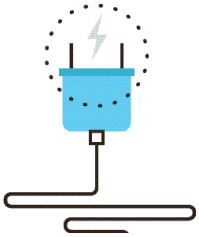
Refrigeration Equipment Maintenance

Preventative maintenance keeps commercial refrigeration equipment running reliably and efficiently. Commercial refrigerators and freezers are mission-critical equipment that can cost a fortune when they go down. Even when they appear to be working properly, refrigeration units can be consuming too much energy. Have walk-in refrigeration and freezer and other commercial systems serviced at least annually. This practice will allow systems to perform to their highest capabilities and will help identify system issues if they exist.

Maintaining your commercial refrigeration equipment can save between 5% and 10% on energy costs. When condenser coils are dirty, your commercial refrigerators and freezers work harder to maintain the temperature inside. Worn gaskets, hinges, door handles or faulty seals cause cold air to leak from the unit, forcing the unit to run longer and use more electricity.

Regular cleaning and maintenance also help your commercial refrigeration equipment to last longer.

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[5]. Your local utility may offer incentives or rebates for this equipment.

Computer Power Management Software

Many computers consume power during nights, weekends, and holidays. Screen savers are commonly confused as a power management strategy. This contributes to avoidable, excessive electrical energy consumption. There are innovative power management software packages available that are designed to deliver significant energy saving and provide ongoing tracking measurements. A central power management platform helps enforce energy savings policies as well as identify and eliminate underutilized devices.

Water Conservation

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

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

[5] 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.

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

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

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

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

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

Procurement Strategies

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

6 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.

An additional study for solar photovoltaic for Green Brook Regional Center is provided below.

Executive Summary

This section summarizes projected energy and cost impacts, as well as design considerations, for a proposed 361 kW-DC carport solar photovoltaic (PV) system and 300 kWh battery energy storage system (BESS) for the NJ DHS Greenbrook Regional Center site located at 275 Greenbrook Rd, Green Brook Township, NJ 08812. Please note this is a feasibility stage study, and all cost/savings values are solely estimates and not for design level application.

Two pieces of equipment contribute to the system:

- 361 kW Carport Solar PV System: The carport-mounted solar panels are strategically positioned to make the most efficient use of the parking space, maximizing the coverage of solar energy generation, while avoiding the shaded areas.
- 300 kWh BESS: The sizing of the battery has been optimized to ensure that the projected annual cost savings remain within a positive range for the battery installation project.

Please take note that the site's highest electricity demand for moth of January 2022 is around 418 kW. Opting for a larger battery to sustain the entire electric load of the facilities during a power outage is not a financially viable solution.

Equipment	Estimated Max Demand Savings (kW)	Estimated Annual Energy Generation (kWh)	Estimated Annual GHG Reduction ($MT\text{-}CO_2e$)	Estimated Annual Cost Savings ($)	Estimated Gross Project Cost ($)	Total Incentives ($)	Net Project Cost ($)	Simple Payback Period (yr)
361 kW Solar PV	0	482,612	96	$53,142	$2,036,758	$1,120,217	$916,541	17.2
300 kWh Battery	37	0	0	$663	$365,242	$200,883	$164,359	247.8
Total	37	482,612	96	$53,805	$2,402,000	$1,321,100	$1,080,900	20.1

Project Summary Table

Equipment	Estimated Gross Project Cost ($)	ITC Rebate	MACRS Rebate	Net Project Cost
361 kW Solar PV	$2,036,758	$611,028	$509,190	$916,541
300 kWh Battery	$365,242	$109,572	$91,310	$164,359
Total	$2,402,000	$720,600	$600,500	$1,080,900

Incentive Summary Table

Multiple incentives are available to reduce the project cost.

1. Federal Income Tax Credit (ITC): As of the passage of the 2022 Inflation Reduction Act, the ITC refund can be claimed by non-taxable entities as a cash rebate. The ITC is equal to 30% of the system cost and is scheduled to persist until 2033.
2. Modified Accelerated Cost Recovery System (MACRS): As of the passage of the 2022 Inflation Reduction Act, the MACRS refund can be claimed by non-taxable entities as a cash rebate. This rebate allows 85% of the system cost to be claimed as equipment depreciation at Year 1, approximately equivalent to 25% of the system cost.

Ownership Models

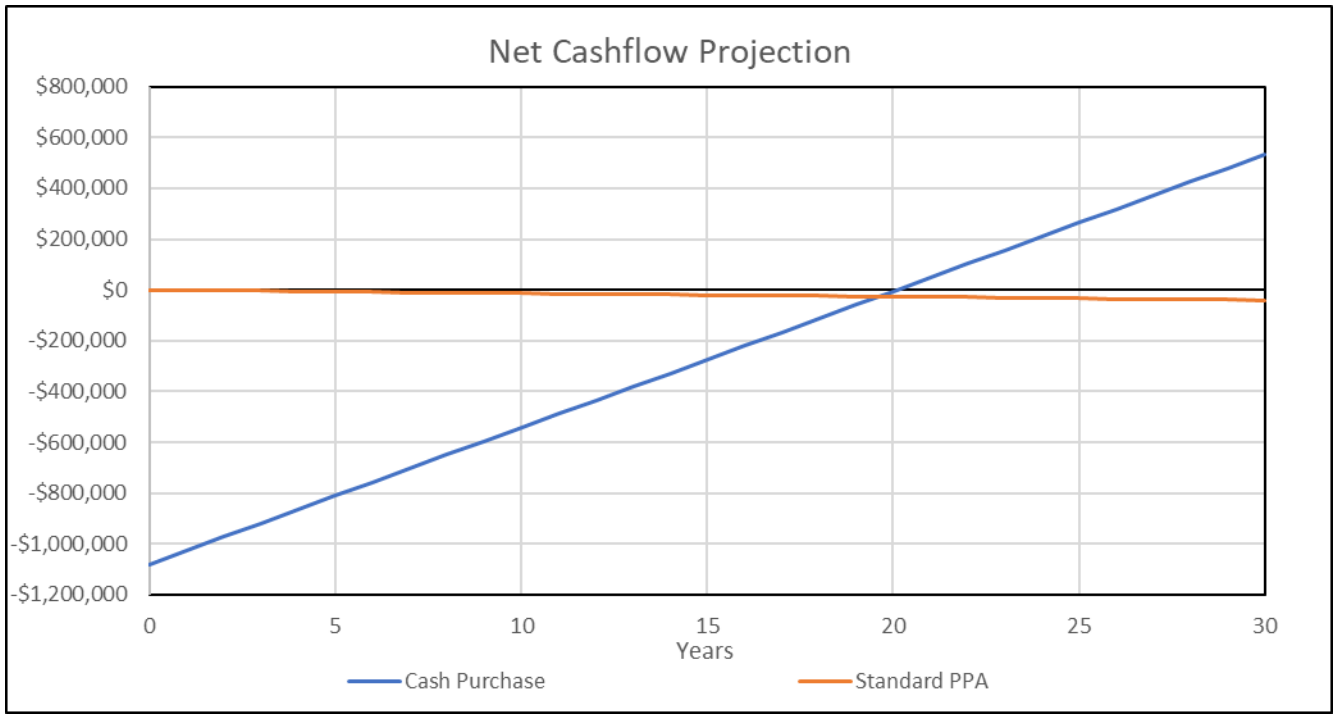
This report explores two ownership models: Cash Purchase and Power Purchase Agreement (PPA).

- Cash Purchase: In this case, the entire system is purchased upfront by the customer.
- Standard Power Purchase Agreement: In this scenario, a third party installs and owns the system, and sells electricity to the customer at a reduced rate. Calculations assume the owner charges a 3% interest rate on the system. In the table below, the interest rate is factored in as an offset to the "Annual Savings ($)". Return on Investment (ROI) is null because there is no cost to the customer.

Ownership Plan	Upfront Cost	Year 1 Cost After Rebates	Annual Savings	Lifetime 30-Year Cost Savings ($)	30-Year ROI
Cash Purchase	$2,402,000	$1,080,900	$53,805	$1,614,163	149%
PPA	$0	$0	($1,341)	($40,239)	-

Ownership Model Table

Analysis clearly shows that opting for a cash purchase is more advantageous than choosing a Power Purchase Agreement (PPA). This conclusion is based on the consideration of existing available incentives (i.e., ITC & MACRS) and relatively higher interest rates.



Ownership Model Life Cycle Comparison

Emergency Backup System Sizing

As per the most recent 12-month utility data, peak demand is around 418 kW. The battery is sized to be the largest financially viable capacity (i.e. 300 kWh). Opting for a larger battery to sustain the entire electric load of the facilities during a power outage is not a financially viable solution, this option resulted in negative annual cost savings.

PV System Sizing

TRC modeled the proposed solar PV system using HelioScope, a meteorologically and location-dependent solar resource, to estimate its available size and component quantities. The software accounts for building shading, tree shading, panel angles, and appropriate spacing. Please note that the PV system has been size with shade and space limits in mind.

Project Coordination

As per TRC's cost analysis, some of the cost associated with installing the battery system (i.e., trenching, wiring and site preparation) can be shared with PV installation work. *The cost estimate assumes the projects will be implemented concurrently.*

Solar PV Layout Figure – HelioScope Design

Energy Generation and Management

A HelioScope model was developed to establish approximate PV system sizing. The output was entered into Energy Toolbase® (ETB), a TOU BESS and utility cost analysis tool that compares the generation profile vs the building's monthly consumption data. Because the site's energy generation rate structure and energy delivery rate structure are provided by different firms, ETB's estimate of baseline utility cost varied from available billing data by 16%, potentially due to rate schedule changes. ETB outputs were supplemented with worksheet calculations to true up the difference.

Cost savings were finalized by applying an 0.5% annual maintenance cost penalty to the solar PV system, and an 0.25% annual maintenance cost penalty to the BESS. The ETB analysis was used to simulate BESS operation throughout the year and to calculate utility cost savings with hourly utility rate sensitivity.

Project cost estimates were calculated using RS Means 2022 Construction Cost Catalogue, along with vendor quotes and guidelines available from the modeling software. Costs include contingencies and markups for all potential project tasks, including design, permitting, taxes, and a 30% contingency for infrastructure upgrades. A line-by-line breakdown of the costs considered is provided in the calculation's worksheet.

At a high level, average system costs are $5.64/Watt solar PV, and $1,217/kWh BESS, based on the gross project cost.

Please note that while detailed, cost estimates are still at the feasibility stage. Costs may vary by 30% relative to engineering assessments of the electrical and structural infrastructure.

Successor Solar Incentive Program (SuSI)

The SuSI program replaces the SREC Registration Program (SRP) and the Transition Incentive (TI) program. The SuSI program is used to register and certify solar projects in New Jersey. Rebates are not available for solar projects. Solar projects may qualify to earn SREC- IIs (Solar Renewable Energy Certificates-II), however, the project owners *must* register their solar projects prior to the start of construction to establish the project's eligibility.

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:

Successor Solar Incentive Program (SuSI): https://www.njcleanenergy.com/renewable-energy/programs/susi-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.

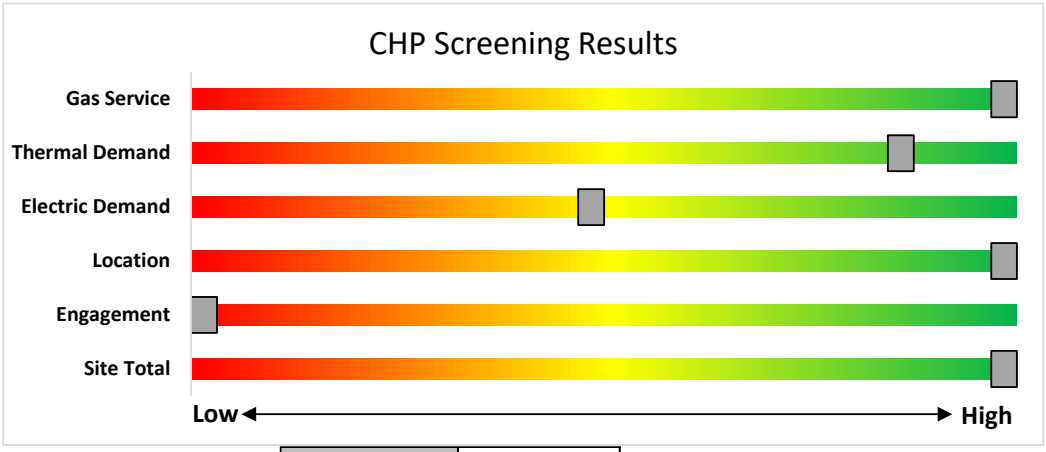
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be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

The magnitude, type, and duration of the thermal demand, the coincident electric load, and the ease of interconnection contribute to the potential for CHP at the site. Based on the amount of steam used throughout the year and the concurrent electric demand a reciprocating engine may be feasible. If you are interested in pursuing CHP, we recommend performing a detailed feasibility study, which will provide a thorough understanding of the costs and savings associated with this technology.

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



Potential	High	
System Type	Recip Engine	
System Potential	390	kW
Electric Generation	839,086	kWh/yr
Thermal Generation	3,830,610	MBtu/yr
Displaced Cost	$74,603	/yr
Installed Cost	$1,840,000	

Figure 8 - 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 ELECTRIC VEHICLES (EV)

All electric vehicles (EVs) have an electric motor instead of an internal combustion engine. EVs function by plugging into a charge point, taking electricity from the grid, and then storing it in rechargeable batteries. Although electricity production may contribute to air pollution, the U.S. EPA categorizes all-electric vehicles as zero-emission vehicles because they produce no direct exhaust or tailpipe emissions.

EVs are typically more expensive than similar conventional and hybrid vehicles, although some cost can be recovered through fuel savings, federal tax credit, or state incentives.

7.1 Electric Vehicle Charging

EV charging stations provide a means for electric vehicle operators to recharge their batteries at a facility. While many EV drivers charge at home, others do not have access to regular home charging, and the ability to charge at work or in public locations is critical to making EVs practical for more drivers. Charging can also be used for electric fleet vehicles, which can reduce fuel and maintenance costs for fleets that replace gas or diesel vehicles with EVs.

EV charging comes in three main types. For this assessment, the screening considers addition of Level 2 charging, which is most common at workplaces and other public locations. Depending on the site type and usage, other levels of charging power may be more appropriate.

The preliminary assessment of EV charging at the facility shows that there is medium potential for adding EV chargers to the facility's parking, based on potential costs of installation and other site factors.

The primary costs associated with installing EV charging are the charger hardware and the cost to extend power from the facility to parking spaces. This may include upgrades to electric panels to serve increased loads.

The type and size of the parking area impact the costs and feasibility of adding EV charging. Parking structure installations can be less costly than surface lot installations as power may be readily available, and equipment and wiring can be surface mounted. Parking lot installations often require trenching through concrete or asphalt surface. Large parking areas provide greater flexibility in charger siting than smaller lots.

The location and capacity of facility electric panels also impact charger installation costs. A Level 2 charger generally requires a dedicated 208-240V, 40 Amp circuit. The electric panel nearest the planned installation may not have available capacity and may need to be upgraded to serve new EV charging loads. Alternatively, chargers could be powered from a more distant panel. The distance from the panel to the location of charging stations ties directly to costs, as conduits, cables, and potential trenching costs all increase on a per-foot basis. The more charging stations planned, the more likely it is that additional electrical capacity will be needed.

Other factors to consider when planning for EV charging at a facility include who the intended users are, how long they park vehicles at the site, and whether they will need to pay for the electricity they use.

The graphic below displays the results of the EV charging assessment conducted as part of this audit. The position of each slider indicates the impact each factor has on the feasibility of installing EV charging at the site.

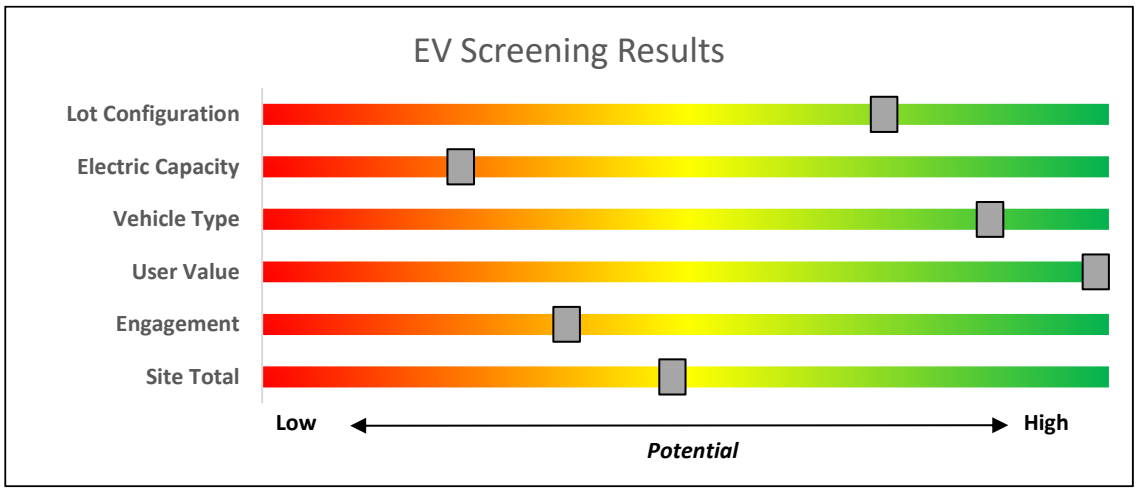


Figure 9 – EV Charger Screening

Electric Vehicle Programs Available

New Jersey is leading the way on electric vehicle (EV) adoption on the East Coast. There are several programs designed to encourage EV adoption in New Jersey, which is crucial to reaching a 100% clean energy future.

NJCEP offers a variety of EV programs for vehicles, charging stations, and fleets. Certain EV charging stations that receive electric utility service from Atlantic City Electric Company (ACE) or Public Service Electric & Gas Company (PSE&G), may be eligible for additional electric vehicle charging incentives directly from the utility. Projects may be eligible for both the incentives offered by this BPU program and incentives offered by ACE or PSE&G, up to 90% of the combined charger purchase and installation costs. Please check ACE or PSE&G program eligibility requirements before purchasing EV charging equipment, as additional conditions on types of eligible chargers may apply for utility incentives.

Both Jersey Central Power & Light (JCP&L) and Rockland Electric (RECO) have filed proposals for EV charging programs. BPU staff is currently reviewing those proposals.

For more information and to keep up to date on all EV programs please visit https://www.njcleanenergy.com/commercial-industrial/programs/electric-vehicle-programs

8 PROJECT FUNDING AND INCENTIVES

Ready to improve your building's performance? New Jersey's Clean Energy Programs and Utility Energy Efficiency Programs can help. Pick the program that works best for you. This section provides an overview of currently available incentive programs in.

8.1 Utility Energy Efficiency Programs

The Clean Energy Act, signed into law by Governor Murphy in 2018, requires New Jersey's investor-owned gas and electric utilities to reduce their customers' use by set percentages over time. To help reach these targets the New Jersey Board of Public Utilities approved a comprehensive suite of energy efficiency programs to be run by the utility companies.

Prescriptive and Custom

The Prescriptive and Custom rebate program through your utility provider 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.

Equipment Examples

Lighting
Lighting Controls
HVAC Equipment
Refrigeration
Gas Heating
Gas Cooling
Commercial Kitchen Equipment
Food Service Equipment
Variable Frequency Drives
Electronically Commutate Motors
Variable Frequency Drives
Plug Loads Controls
Washers and Dryers
Agricultural
Water Heating

The Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type. The Custom program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives.

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 or less over the recent 12-month period. You work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives, and controls.

Incentives

The program pays up to 70% of the total installed cost of eligible measures.

How to Participate

To participate in Direct Install, you will work with a participating contractor. The contractor will be paid the measure incentives directly by the program, which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the Direct Install program, subject to program rules and eligibility, while the remaining percent of the cost is paid to the contractor by the customer.

Engineered Solutions

The Engineered Solutions Program provides tailored energy-efficiency assistance and services to municipalities, universities, schools, hospitals and healthcare facilities (MUSH), non-profit entities, and multifamily buildings. Customers receive expert guided services, including investment-grade energy auditing, engineering design, installation assistance, construction administration, commissioning, and measurement and verification (M&V) services to support the implementation of cost-effective and comprehensive efficiency projects. Engineered Solutions is generally a good option for medium to large sized facilities with a peak demand over 200 kW looking to implement as many measures as possible under a single project to achieve deep energy savings. Engineered Solutions has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program. Incentives for this program are based on project scope and energy savings achieved.

For more information on any of these programs, contact your local utility provider or visit https://www.njcleanenergy.com/transition.

8.2 New Jersey's Clean Energy Programs

Save money while saving the planet! New Jersey's Clean Energy Program is a statewide program that offers incentives, programs, and services that benefit New Jersey residents, businesses, educational, non-profit, and government entities to help them save energy, money, and the environment.

Large Energy Users

The Large Energy Users Program (LEUP) is designed to foster self-directed investment in energy projects. This program is offered to New Jersey's largest energy customers that annually contribute at least $200,000 to the NJCEP aggregate of all buildings/sites. This equates to roughly $5 million in energy costs in the prior fiscal year.

Incentives

Incentives are based on the specifications below. The maximum incentive per entity is the lesser of:

- $4 million
- 75% of the total project(s) cost
- 90% of total NJCEP fund contribution in previous year
- $0.33 per projected kWh saved; $3.75 per projected Therm saved annually

How to Participate

To participate in LEUP, you will first need submit an enrollment application. This program requires all qualified and approved applicants to submit an energy plan that outlines the proposed energy efficiency work for review and approval. Applicants may submit a Draft Energy Efficiency Plan (DEEP), or a Final Energy Efficiency Plan (FEEP). Once the FEEP is approved, the proposed work can begin.

Detailed program descriptions, instructions for applying, and applications can be found at www.njcleanenergy.com/LEUP.

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 will 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.

Successor Solar Incentive Program (SuSI)

The SuSI program replaces the SREC Registration Program (SRP) and the Transition Incentive (TI) program. The program is used to register and certify 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 SREC-IIs (Solar Renewable Energy Certificates-II). SuSI consists of two sub-programs. The Administratively Determined Incentive (ADI) Program and the Competitive Solar Incentive (CSI) Program.

Administratively Determined Incentive (ADI) Program

The ADI Program provides administratively set incentives for net metered residential projects, net metered non-residential projects 5 MW or less, and all community solar projects.

After the registration is accepted, construction is complete, and a complete final as-built packet has been submitted, the project is issued a New Jersey certification number, which enables it to generate New Jersey SREC- IIs.

Market Segments	Size MW dc	Incentive Value ($/SREC II)	Public Entities Incentive Value - $20 Adder ($/SRECII)
Net Metered Residential	All types and sizes	$90	N/A
Small Net Metered Non-Residential located on Rooftop, Carport, Canopy and Floating Solar	Projects smaller than 1 MW	$100	$120
Large Net Metered Non-Residential located on Rooftop, Carport, Canopy and Floating Solar	Projects 1 MW to 5 MW	$90	$110
Small Net Metered Non-Residential Ground Mount	Projects smaller than 1 MW	$85	$105
Large Net Metered Non-Residential Ground Mount	Projects 1 MW to 5 MW	$80	$100
LMI Community Solar	Up to 5 MW	$90	N/A
Non-LMI Community Solar	Up to 5 MW	$70	N/A
Interim Subsection (t)	All types and sizes	$100	N/A

Eligible projects may generate SREC-IIs for 15 years following the commencement of commercial operations which is defined as permission to operate (PTO) from the Electric Distribution Company. After 15 years, projects may be eligible for a NJ Class I REC.

SREC-IIs will be purchased monthly by the SREC-II Program Administrator who will allocate the SREC-IIs 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.

The ADI Program online portal is now open to new registrations.

Competitive Solar Incentive Program

The Competitive Solar Incentive (CSI) Program will provide competitively set incentives for grid supply projects and net metered non-residential projects greater than 5MW (dc). The program is currently under development. For updates, please continue to check the Solar Proceedings page on the New Jersey's Clean Energy Program website.

Solar projects help the State of New Jersey reach renewable energy goals outlined in the state's Energy Master Plan.

If you are considering installing solar photovoltaics on your building, visit the following link for more information: https://njcleanenergy.com/renewable-energy/programs/susi-program.

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 into contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the energy conservation measures (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 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.

9 PROJECT DEVELOPMENT

Energy conservation measures (ECMs) have been identified for your site, and their energy and economic analyses are provided within this LGEA report. Note that some of the identified projects may be mutually exclusive, such as replacing equipment versus upgrading motors or controls. 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 that includes the review of multiple bids for project work, incorporates potential operations and maintenance (O&M) cost savings, and maximizes your incentive potential.

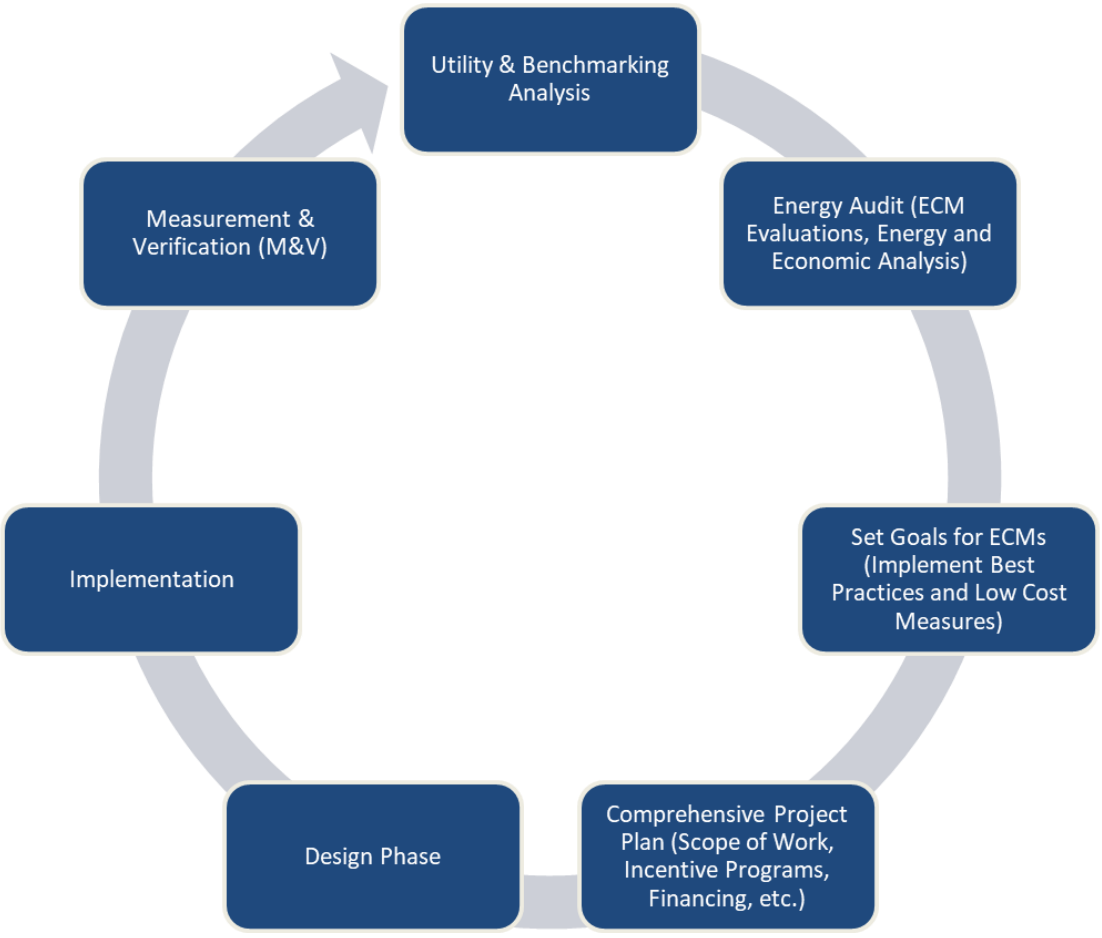


Figure 8 – Project Development Cycle

10 Energy Purchasing and Procurement Strategies

10.1 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. Though you may choose a different company from which to buy your electric power, responsibility for your facility's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

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

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

10.2 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 fluctuate monthly. The utility provides basic gas supply service to customers who choose not to buy from a third-party supplier for natural gas commodity.

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

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

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

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

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

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
101	2	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.1	444	0	$61	$479	$55	6.9
102	4	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.3	888	0	$123	$689	$75	5.0
103	7	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	7	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.5	1,553	0	$215	$1,003	$105	4.2
104	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
105	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
106	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
107	4	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.3	888	0	$123	$689	$75	5.0
108	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
109	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
110	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
111	8	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	8	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.6	1,775	0	$246	$1,378	$150	5.0
114	6	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.4	1,331	0	$184	$898	$95	4.4
116	4	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.3	888	0	$123	$689	$75	5.0
118	8	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	8	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.6	1,775	0	$246	$1,378	$150	5.0
119	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	37	0	$5	$270	$35	46.0
120	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
122	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	37	0	$5	$270	$35	46.0
123	5	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	5	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.1	185	0	$26	$270	$35	9.2
123 (2)	2	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.1	444	0	$61	$479	$55	6.9
123(3)	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	37	0	$5	$270	$35	46.0
125	1	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.1	222	0	$31	$375	$45	10.7
127	4	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.3	888	0	$123	$689	$75	5.0
129	1	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.1	222	0	$31	$375	$45	10.7
130	4	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.3	888	0	$123	$689	$75	5.0
132	7	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	7	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.5	1,553	0	$215	$1,003	$105	4.2

	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
134	8	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	8	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.6	1,775	0	$246	$1,378	$150	5.0
135	4	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.3	888	0	$123	$689	$75	5.0
136	4	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.3	888	0	$123	$689	$75	5.0
137	4	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.3	888	0	$123	$689	$75	5.0
146	12	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	S	6	3,150	5	None	Yes	12	LED Lamps: (1) 5.5W Plug-In Lamp	Occupancy Sensor	6	2,174	0.0	70	0	$10	$540	$70	48.8
146	7	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	7	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.1	258	0	$36	$270	$35	6.6
147	25	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	25	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	1.7	5,548	-1	$767	$3,428	$355	4.0
332	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
A112	8	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	8	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.6	1,775	0	$246	$1,378	$150	5.0
Client restroom 5	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	8,736	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	6,028	0.0	307	0	$42	$270	$35	5.5
Client restroom 6	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	8,736	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	6,028	0.0	307	0	$42	$270	$35	5.5
Corridor 4	9	Exit Signs: Incandescent	None		30	8,760	4	Fixture Replacement	No	9	LED Exit Signs: 2 W Lamp	None	6	8,760	0.2	2,044	0	$283	$652	$0	2.3
Corridor 4	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
Corridor 4	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	8,736	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	6,028	0.0	102	0	$14	$225	$35	13.4
Corridor 4	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	8,736	2, 5	Relamp & Reballast	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,028	0.4	3,849	-1	$532	$580	$165	0.8
Exterior 1	2	Incandescent: (1) 60W Screw-in Lamps	Timeclock		60	4,380	3	Relamp	No	2	LED Lamps: (1) 18.5W Plug-In Lamp	Timeclock	19	4,380	0.0	364	0	$51	$34	$2	0.6
Exterior 1	4	LED - Fixtures: Ceiling Mount	Timeclock		20	4,380		None	No	4	LED - Fixtures: Ceiling Mount	Timeclock	20	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 1	11	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Photocell		30	4,380		None	No	11	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Photocell	30	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 1	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		30	4,380		None	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	30	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 1	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		30	4,380		None	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	30	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 1	9	LED - Fixtures: Wall Pack	Photocell		25	4,380		None	No	9	LED - Fixtures: Wall Pack	Photocell	25	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 1	6	High-Pressure Sodium: (1) 100W Lamp	Timeclock		138	4,380	1	Fixture Replacement	No	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	50	4,380	0.0	2,313	0	$324	$2,223	$300	5.9
Kitchen 1	27	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	27	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.3	997	0	$138	$810	$105	5.1
Kitchen 1	5	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	5	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.1	237	0	$33	$270	$35	7.2
Locksmith	4	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.3	888	0	$123	$689	$75	5.0

	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
Locksmith	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,150	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,174	0.1	429	0	$59	$380	$65	5.3
Lounge 7	16	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	16	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Lounge 7	48	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	48	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.6	1,772	0	$245	$1,350	$175	4.8
Lounge 7	127	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	127	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	1.9	6,027	-1	$834	$3,240	$420	3.4
Lounge 7	9	Linear Fluorescent - T12: 2' T12 (20W) - 1L	Wall Switch	S	25	3,150	2, 5	Relamp & Reballast	Yes	9	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,174	0.2	586	0	$81	$977	$97	10.9
Lounge 7	7	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	3,150	2, 5	Relamp & Reballast	Yes	7	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,174	0.3	857	0	$119	$624	$70	4.7
Lounge 7	26	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	26	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	1.8	5,770	-1	$798	$3,533	$365	4.0
Lounge 7	275	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,150	3, 5	Relamp	Yes	275	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	21.8	69,212	-15	$9,575	$27,103	$6,410	2.2
Multipurpose 2	15	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,150	2, 5	Relamp & Reballast	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	2.2	6,939	-1	$960	$2,315	$370	2.0
Multipurpose 3	1	Exit Signs: Incandescent	None		30	8,760	4	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.0	227	0	$31	$72	$0	2.3
Multipurpose 3	9	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	9	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.1	332	0	$46	$540	$70	10.2
Multipurpose 3	11	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	11	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.2	522	0	$72	$540	$70	6.5
Multipurpose 3	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	3,150	5	None	Yes	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,174	0.0	18	0	$2	$270	$35	94.7
Multipurpose 3	14	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,150	2, 5	Relamp & Reballast	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	2.0	6,476	-1	$896	$2,197	$350	2.1
Multipurpose 3	3	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.2	666	0	$92	$584	$65	5.6
Multipurpose 4	12	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,150	2, 5	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	1.7	5,551	-1	$768	$1,960	$310	2.1
Multipurpose 5	5	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	5	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.1	185	0	$26	$270	$35	9.2
Multipurpose 5	3	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	142	0	$20	$270	$35	11.9
Multipurpose 5	33	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,150	2, 5	Relamp & Reballast	Yes	33	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	4.8	15,266	-3	$2,112	$4,716	$765	1.9
Multipurpose 5	7	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	3,150	2, 5	Relamp & Reballast	Yes	7	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,174	0.5	1,553	0	$215	$1,003	$105	4.2
Restroom - Female 2	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	8,736	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	6,028	0.0	102	0	$14	$116	$20	6.8
Restroom - Female 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	8,736	3, 5	Relamp	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,028	0.1	698	0	$97	$189	$40	1.5
Restroom - Male 2	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	8,736	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	6,028	0.0	102	0	$14	$116	$20	6.8
Restroom - Male 2	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	8,736	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	6,028	0.0	132	0	$18	$116	$20	5.3
Restroom - Unisex 2	1	Incandescent: (1) 30W A19 Screw-In Lamp	Wall Switch	S	30	8,736	3, 5	Relamp	Yes	1	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	6,028	0.0	215	0	$30	$133	$21	3.8

	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
Stairs 1	6	LED - Fixtures: Ceiling Mount	None	S	20	8,736		None	No	6	LED - Fixtures: Ceiling Mount	None	20	8,736	0.0	0	0	$0	$0	$0	0.0
Stairs 2	6	LED - Fixtures: Ceiling Mount	None	S	20	8,736		None	No	6	LED - Fixtures: Ceiling Mount	None	20	8,736	0.0	0	0	$0	$0	$0	0.0
Storage 6	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	525	5	None	Yes	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	362	0.0	2	0	$0	$116	$20	394.8
201	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
202	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
203	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
203	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	47	0	$7	$270	$35	35.8
204	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
204	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	47	0	$7	$270	$35	35.8
205	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
206	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
207	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
208	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
209	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
210	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
211	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
212	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
213	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
214	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
215	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
216	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
217	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
218	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
219	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
221	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
222	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
223	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
224	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
225	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
226	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
227	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
227	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	47	0	$7	$270	$35	35.8
228	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
242	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,150	3, 5	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	0.5	1,510	0	$209	$708	$155	2.6
251A	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
329	3	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	142	0	$20	$270	$35	11.9
352	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
352	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	3,150	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,174	0.0	143	0	$20	$307	$45	13.2
Client Restroom 3	3	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	8,736	5	None	Yes	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	6,028	0.0	395	0	$55	$270	$35	4.3
Client restroom 4	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	8,736	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	6,028	0.0	307	0	$42	$270	$35	5.5
Corridor 2	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 2	4	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	8,736	5	None	Yes	4	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	6,028	0.1	526	0	$73	$225	$140	1.2
Corridor 2	10	LED - Fixtures: Ceiling Mount	Wall Switch	S	20	8,736	5	None	Yes	10	LED - Fixtures: Ceiling Mount	Occupancy Sensor	20	6,028	0.1	585	0	$81	$450	$350	1.2
Corridor 2	7	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	8,736	2, 5	Relamp & Reballast	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,028	1.0	8,981	-2	$1,242	$1,054	$365	0.6
Corridor 3	8	Exit Signs: Incandescent	None		30	8,760	4	Fixture Replacement	No	8	LED Exit Signs: 2 W Lamp	None	6	8,760	0.2	1,816	0	$251	$579	$0	2.3
Corridor 3	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
Corridor 3	7	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	8,736	5	None	Yes	7	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	6,028	0.0	205	0	$28	$225	$225	0.0
Corridor 3	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	8,736	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	6,028	0.0	102	0	$14	$225	$35	13.4
Corridor 3	218	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	8,736	2, 5	Relamp & Reballast	Yes	218	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	6,028	15.2	134,165	-29	$18,561	$27,553	$6,905	1.1
Laundry	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,150	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	0.2	503	0	$70	$416	$75	4.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Lounge 3	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,150	3, 5	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	0.3	1,007	0	$139	$562	$115	3.2
Lounge 4	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
Lounge 4	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,150	3, 5	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	0.4	1,258	0	$174	$635	$135	2.9
Lounge 5	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,150	3, 5	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	0.3	1,007	0	$139	$562	$115	3.2
Lounge 6	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,150	2, 5	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	0.6	1,850	0	$256	$743	$115	2.5
Main Offices	17	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	17	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.3	807	0	$112	$540	$70	4.2
Main Offices	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,150	2, 5	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	0.1	463	0	$64	$388	$55	5.2
Nurse room	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	8,736	2, 5	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,028	0.1	641	0	$89	$339	$45	3.3
Nurse room	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	8,736	3, 5	Relamp	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,028	0.1	698	0	$97	$343	$55	3.0
Restroom - Female 1	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	8,736	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	6,028	0.0	132	0	$18	$116	$20	5.3
Restroom - Female 1	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	8,736	2, 5	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,028	0.1	1,283	0	$177	$234	$40	1.1
Restroom - Male 1	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	8,736	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	6,028	0.0	132	0	$18	$116	$20	5.3
Restroom - Male 1	1	U-Bend Fluorescent - T12: U T12 (40W) - 2L	Wall Switch	S	88	8,736	2, 5	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	6,028	0.1	615	0	$85	$221	$30	2.2
Restroom - Male 1 (1)	1	Incandescent: (1) 30W A19 Screw-In Lamp	Wall Switch	S	30	8,736	3, 5	Relamp	Yes	1	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	6,028	0.0	215	0	$30	$133	$21	3.8
Soiled sheets room	4	LED - Fixtures: Ambient 2x4 Fixture	None	S	45	8,736	5	None	Yes	4	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	6,028	0.1	526	0	$73	$116	$20	1.3
Storage 3	1	Compact Fluorescent: (1) 15W Plug-in Lamps	Wall Switch	S	15	525	3, 5	Relamp	Yes	1	LED Lamps: (1) 5.5W Plug-In Lamp	Occupancy Sensor	6	362	0.0	6	0	$1	$141	$25	132.0
Storage 4	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	525	5	None	Yes	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	362	0.0	2	0	$0	$116	$20	394.8
Storage 5	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	525	2, 5	Relamp & Reballast	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	362	0.4	231	0	$32	$471	$80	12.2
Tub room 3	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,150	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	0.2	503	0	$70	$416	$75	4.9
Tub room 4	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,150	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,174	0.2	503	0	$70	$416	$75	4.9
301	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
302	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
303	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
304	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
305	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	37	0	$5	$270	$35	46.0

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305	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	47	0	$7	$270	$35	35.8
306	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
307	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
308	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
309	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
309	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	47	0	$7	$270	$35	35.8
310	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
311	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
312	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
313	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
314	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
315	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	37	0	$5	$270	$35	46.0
315	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	47	0	$7	$270	$35	35.8
316	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
317	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
318	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
321	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
322	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
322 (2)	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
322 (3)	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
322 (4)	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
323	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
325	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	37	0	$5	$270	$35	46.0
325	2	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	95	0	$13	$270	$35	17.9
325 (0)	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	37	0	$5	$270	$35	46.0

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325 (0)	2	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	95	0	$13	$270	$35	17.9
326	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
326	2	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	95	0	$13	$270	$35	17.9
327	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	74	0	$10	$270	$35	23.0
328	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
331	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
331 (1)	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	111	0	$15	$270	$35	15.3
343	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	148	0	$20	$270	$35	11.5
343	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	3,150	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,174	0.0	143	0	$20	$307	$45	13.2
Client Restroom	3	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	8,736	5	None	Yes	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	6,028	0.0	395	0	$55	$270	$35	4.3
Client restroom 2	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	8,736	5	None	Yes	3	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	6,028	0.0	307	0	$42	$270	$35	5.5
Corridor 1	8	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 1	40	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	8,736	5	None	Yes	40	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	6,028	0.6	5,265	-1	$728	$1,080	$140	1.3
Direct tv room	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	2,174	0.0	37	0	$5	$270	$35	46.0
Direct tv room	2	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	95	0	$13	$270	$35	17.9
Housekeeping 1	1	LED Lamps: (2) 10W A19 Screw-In Lamps	Wall Switch	S	20	3,150	5	None	Yes	1	LED Lamps: (2) 10W A19 Screw-In Lamps	Occupancy Sensor	20	2,174	0.0	21	0	$3	$270	$35	80.5
Housekeeping 2	1	LED Lamps: (2) 10W A19 Screw-In Lamps	Wall Switch	S	20	3,150	5	None	Yes	1	LED Lamps: (2) 10W A19 Screw-In Lamps	Occupancy Sensor	20	2,174	0.0	21	0	$3	$270	$35	80.5
Lounge 1	4	LED - Fixtures: Ambient 2x4 Fixture	None	S	45	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.1	190	0	$26	$270	$35	8.9
Lounge 2	4	LED - Fixtures: Ambient 2x4 Fixture	None	S	45	3,150	5	None	Yes	4	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.1	190	0	$26	$270	$35	8.9
Snack prep room	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	8,736	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	6,028	0.0	132	0	$18	$270	$35	12.9
Storage 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	525	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	362	0.0	24	0	$3	$153	$30	37.2
Storage 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	525	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	362	0.0	24	0	$3	$153	$30	37.2
Tub room	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	47	0	$7	$270	$35	35.8
Tub room 2	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	45	3,150	5	None	Yes	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,174	0.0	47	0	$7	$270	$35	35.8
Mechanical 1	7	Exit Signs: LED - 2 W Lamp	None		6	3,150		None	No	7	Exit Signs: LED - 2 W Lamp	None	6	3,150	0.0	0	0	$0	$0	$0	0.0

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Mechanical 1	6	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	3,150		None	No	6	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	3,150	0.0	0	0	$0	$0	$0	0.0
Mechanical 1	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	3,150		None	No	3	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	35	3,150	0.0	0	0	$0	$0	$0	0.0
Mechanical 1	42	LED Lamps: (1) 75W Corn Bulb Screw-In Lamp	Wall Switch	S	75	3,150		None	No	42	LED Lamps: (1) 75W Corn Bulb Screw-In Lamp	Wall Switch	75	3,150	0.0	0	0	$0	$0	$0	0.0
Mechanical 1	2	LED - Fixtures: Ceiling Mount	Wall Switch	S	20	3,150		None	No	2	LED - Fixtures: Ceiling Mount	Wall Switch	20	3,150	0.0	0	0	$0	$0	$0	0.0
Mechanical 1	8	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	3,150	2	Relamp & Reballast	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,150	0.5	1,606	0	$222	$550	$80	2.1
Mechanical 1	1	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Wall Switch	S	120	3,150	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,150	0.1	211	0	$29	$73	$20	1.8
Mechanical 1	25	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,150	3	Relamp	No	25	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,150	0.5	1,488	0	$206	$456	$125	1.6
Mechanical 1	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,150	3	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,150	0.1	197	0	$27	$145	$20	4.6

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
Mechanical 1	DHW	2	DHW Circulation Pump	0.1	65.0%	No	Bell & Gossett	1E91	W	8,760		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Unit Heater	4	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
332	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Client restroom 5	Unit Ventilator	2	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Client restroom 6	Unit Ventilator	2	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Lounge 7	Unit Ventilator	2	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
201	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
202	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
203	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
204	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
205	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
206	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
207	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
208	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
209	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
210	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
211	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
212	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
213	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
214	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0

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215	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
216	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
217	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
218	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
219	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
221	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
222	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
223	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
224	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
225	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
226	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
227	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
228	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Client Restroom 3	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Client restroom 4	Unit Ventilator	2	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Lounge 3	Unit Ventilator	2	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Lounge 5	Unit Ventilator	2	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
301	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
302	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
303	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0

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304	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
305	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
306	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
307	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
308	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
309	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
310	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
311	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
312	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
313	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
314	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
315	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
316	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
317	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
318	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
321	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
322	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
322 (2)	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
322 (3)	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
322 (4)	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0

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323	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
325	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
325 (0)	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
326	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
327	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
328	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
331	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
331 (1)	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Client Restroom	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Client restroom 2	Unit Ventilator	2	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Lounge 1	Unit Ventilator	2	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Lounge 2	Unit Ventilator	2	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Tub room 2	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Unit Ventilator	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	3,800		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Air Handling Unit	7	Supply Fan	1.0	80.0%	No	York	<not visible>	W	3,800		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Air Handling Unit	7	Supply Fan	0.8	80.0%	No	York	<not visible>	W	3,800		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Air Handling Unit	9	Supply Fan	5.0	80.0%	No	York	<not visible>	W	3,800		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Boiler	2	Combustion Air Fan	7.5	85.5%	No	<not visible>	<not visible>	W	3,391	8	No	91.7%	Yes	2	4.9	18,668	0	$2,619	$13,185	$2,000	4.3
Mechanical 1	Boiler	2	Boiler Feed Water Pump	7.5	92.0%	No	Baldor	36B101T849H1	W	3,391	9	No	92.0%	Yes	2	7.5	15,467	0	$2,170	$11,881	$2,000	4.6
Mechanical 1	Chiller	1	Chilled Water Pump	20.0	82.0%	No	Baldor	39B101X113H1	W	3,391	6	No	93.0%	Yes	1	4.8	28,063	0	$3,937	$10,892	$1,300	2.4

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Mechanical 1	Chiller	1	Condenser Water Pump	15.0	75.0%	No	Baldor	37F599Y723H1	W	3,391	6	No	93.0%	Yes	1	4.2	25,582	0	$3,589	$9,177	$1,200	2.2
Mechanical 1	Chiller	1	Condenser Water Pump	15.0	82.0%	No	Emerson	DB67	W	3,391	6	No	93.0%	Yes	1	3.6	21,048	0	$2,953	$9,177	$1,200	2.7
Mechanical 1	Chiller	1	Chilled Water Pump	40.0	88.5%	Yes	<not visible>	<not visible>	W	4,067		No	88.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Air Compressor	1	Air Compressor	2.0	81.5%	No	Dayton	2N982G	W	2,000		No	81.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Air Compressor	1	Air Compressor	2.0	81.5%	No	Dayton	2N982G	W	3,000		No	81.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Air Compressor	2	Air Compressor	2.0	81.5%	No	Dayton	2N982G	W	3,000		No	81.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Air Compressor	1	Air Compressor	3.0	80.0%	No	Century Electric	<not visible>	W	2,000		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Exhaust fan	25	Exhaust Fan	1.0	70.0%	No	Dayton	4YU26	W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Heating hot water pump	4	Heating Hot Water Pump	15.0	91.0%	No	Marathon	<not visible>	W	3,391	7	No	93.0%	Yes	4	6.3	64,968	0	$9,114	$36,709	$4,800	3.5
Mechanical 1	deaerator	2	Process Pump	10.0	90.2%	No	Baldor	<not visible>	W	3,391	10	No	91.7%	Yes	2	2.1	21,653	0	$3,038	$13,393	$2,200	3.7
Mechanical 1	air purifier	2	Ventilation Fan	0.3	65.0%	No	<not visible>	<not visible>	W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	elevator motor	4	Other	40.0	85.5%	No	<not visible>	<not visible>	W	2,900		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Drain pumps	2	Process Pump	2.0	85.5%	Yes	<not visible>	<not visible>	W	2,745		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Drain pumps	2	Process Pump	2.0	85.5%	No	<not visible>	<not visible>	W	2,745	10	No	86.5%	Yes	2	0.4	3,667	0	$514	$8,363	$200	15.9
Mechanical 1	Return Fan	1	Return Fan	0.3	65.0%	No	<not visible>	<not visible>	W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Ventilation Fan	2	Ventilation Fan	0.3	65.0%	No	<not visible>	<not visible>	W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Cooling Tower Fan	1	Cooling Tower Fan	15.0	91.0%	No	<not visible>	<not visible>	W	3,391		No	91.0%	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
Mechanical 1	Window Air Conditioner	1	Window AC	1.00		11.00		Friedrich	<not visible>	W		No							0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Window Air Conditioner	3	Window AC	1.00		11.00		<not visible>	<not visible>	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior 1	Mini-Split	1	Ductless Mini-Split HP	1.50	18.00	12.50	12.5 HSPF	Mitsubishi	<not visible>	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior 1	Mini-Split	2	Ductless Mini-Split AC	1.00		11.00		Mitsubishi	PUY-A24NHA6	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior 1	Mini-Split	3	Ductless Mini-Split HP	1.50	21.60	12.70	11 HSPF	Daikin	RXS18LVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior 1	Mini-Split	1	Ductless Mini-Split AC	2.00		12.00		Daikin	RK24NMVJU	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
Mechanical 1	Chiller	1	Water-Cooled Screw Chiller	272.00	York	YRTDTBTO-17AS	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
Mechanical 1	Steam Boiler	2	Induced Draft Steam Boiler	7,168	Cyclonetic	JB3C-75EP170-M.30-MP-NFPA	B		No						0.0	0	0	$0	$0	$0	0.0

Pipe Insulation Recommendations

		Recommendation Inputs			Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	ECM #	Length of Uninsulated Pipe (ft)	Pipe Diameter (in)	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 1	DHW	11	20	2.00	0.0	0	16	$144	$266	$40	1.6

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
146	DHW	1	Storage Tank Water Heater (≤ 50 Gal)	Bradford White Corp.	RE120U6-1NAL	W		No						0.0	0	0	$0	$0	$0	0.0
Mechanical 1	DHW	2	Boiler	P-K Compact	<not visible>	W	12	Yes	2	Condensing Boiler	Natural Gas	93.00%	Et	0.0	0	944	$8,601	$270,682	$0	31.5

Low-Flow Device Recommendations

	Recommedation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	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
Kitchen Faucets	13	20	Faucet Aerator (Kitchen)	2.20	1.50	0.0	0	8	$71	$143	$40	1.5
Restroom Faucets	13	121	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	115	$1,047	$868	$434	0.4
Showerheads	13	78	Showerhead	2.20	2.00	0.0	0	86	$780	$6,965	$1,170	7.4
Kitchen Faucets	13	2	Faucet Aerator (Lavatory)	2.20	0.50	0.0	278	0	$39	$14	$7	0.2

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions				Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Manufacturer	Model	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	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
Kitchen 1	1	Cooler (35F to 55F)	<not visible>	<not visible>	14, 15	Yes	Yes	Yes	0.0	324	0	$45	$2,496	$165	51.3
Kitchen 1	1	Medium Temp Freezer (0F to 30F)	<not visible>	<not visible>	14, 15	Yes	Yes	Yes	0.0	564	0	$79	$2,799	$205	32.8
Kitchen 1	1	Medium Temp Freezer (0F to 30F)	Crowntonka	<not visible>	14, 15	Yes	Yes	Yes	0.0	564	0	$79	$2,799	$205	32.8
Kitchen 1	1	Medium Temp Freezer (0F to 30F)	<not visible>	<not visible>	14, 15	Yes	Yes	Yes	0.0	564	0	$79	$2,799	$205	32.8
Lounge 7	1	Medium Temp Freezer (0F to 30F)	Arctic Industries Inc.	<not visible>	14, 15	Yes	Yes	Yes	0.0	564	0	$79	$2,799	$205	32.8

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
Multipurpose 3	1	Freezer Chest	Frigidaire	<not visible>	No	16	Yes	0.5	4,077	0	$572	$2,200	$0	3.8
Snack prep room	1	Refrigerator Chest	Saba	<not visible>	No	16	Yes	0.1	1,026	0	$144	$1,326	$0	9.2
Kitchen 1	7	Stand-Up Freezer, Glass Door (31 - 50 cu. ft.)	Continental Refrigerator	2F	No	16	Yes	4.3	37,303	0	$5,233	$35,665	$3,500	6.1
Lounge 7	1	Stand-Up Freezer, Solid Door (>50 cu. ft.)	Continental Refrigerator	3F	No	16	Yes	0.5	4,375	0	$614	$3,732	$600	5.1
Lounge 7	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Continental Refrigerator	2R	No	16	Yes	0.1	919	0	$129	$2,176	$125	15.9

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
Kitchen 1	1	Self-Contained Unit (<175 lbs/day), Batch	<not visible>	<not visible>	No	16	Yes	0.1	649	0	$91	$2,956	$50	31.9

Cooking Equipment Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	Manufacturer	Model	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen 1	1	Gas Convection Oven (Full Size)	<not visible>	<not visible>	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen 1	1	Insulated Food Holding Cabinet (1/2 Size)	<not visible>	<not visible>	No		No	0.0	0	0	$0	$0	$0	0.0

Dishwasher Inventory & Recommendations

	Existing Conditions							Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Dishwasher Type	Manufacturer	Model	Water Heater Fuel Type	Booster Heater Fuel Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Payback w/ Incentives in Years
Kitchen 1	1	Single Tank Conveyor (Low Temp)	Hobart	<not visible>	Natural Gas	N/A	No		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
Lounge 7	6	Clothes Dryer	1,000	No		
Laundry	1	Clothes Dryer	1,000	No		
Lounge 7	1	Clothes Washer	800	No		
Lounge 7	1	Clothes Washer	800	No		
Laundry	2	Clothes Washer	800	No		
114	1	Coffee Machine	1,000	No		
Kitchen 1	1	Coffee Machine	1,000	No		
Multipurpose 3	1	Coffee Machine	1,000	No		
242	1	Coffee Machine	1,000	No		
Lounge 6	1	Coffee Machine	1,000	No		
Main Offices	2	Coffee Machine	1,000	No		
146	1	Dehumidifier	250	No		
147	1	Dehumidifier	250	No		
Corridor 4	3	Dehumidifier	250	No		
Lounge 7	1	Dehumidifier	250	No		
Multipurpose 4	1	Dehumidifier	250	No		
Multipurpose 5	1	Dehumidifier	250	No		
Multiple Rooms	100	Desktop	150	No		
Mechanical 1	1	Fan (Ceiling)	150	No		
Mechanical 1	3	Fan (Large)	200	No		
Multiple Rooms	84	Fan (Portable)	100	No		
103	1	Microwave	1,000	No		
105	1	Microwave	1,000	No		
110	1	Microwave	1,000	No		
111	1	Microwave	1,000	No		
114	1	Microwave	1,000	No		
118	1	Microwave	1,000	No		
127	1	Microwave	1,000	No		
Kitchen 1	1	Microwave	1,000	No		
Locksmith	1	Microwave	1,000	No		
Lounge 7	14	Microwave	1,000	No		
Multipurpose 5	2	Microwave	1,000	No		
242	1	Microwave	1,000	No		
Corridor 3	2	Microwave	1,000	No		
Lounge 6	1	Microwave	1,000	No		

	Existing Conditions					
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?	Manufacturer	Model
Main Offices	3	Microwave	1,000	No		
Mechanical 1	3	Microwave	1,000	No		
114	1	Paper Shredder	100	No		
118	1	Paper Shredder	100	No		
127	1	Paper Shredder	100	No		
332	1	Paper Shredder	100	No		
Lounge 7	1	Paper Shredder	100	No		
Multipurpose 5	4	Paper Shredder	100	No		
Corridor 2	1	Paper Shredder	100	No		
Corridor 3	3	Paper Shredder	100	No		
Lounge 4	1	Paper Shredder	100	No		
Main Offices	2	Paper Shredder	100	No		
Corridor 1	1	Paper Shredder	100	No		
Mechanical 1	1	Paper Shredder	100	No		
135	1	Printer (Medium/Small)	100	No		
Kitchen 1	1	Printer (Medium/Small)	100	No		
Locksmith	1	Printer (Medium/Small)	100	No		
Lounge 7	16	Printer (Medium/Small)	100	No		
Multipurpose 3	1	Printer (Medium/Small)	100	No		
Multipurpose 5	2	Printer (Medium/Small)	100	No		
242	1	Printer (Medium/Small)	100	No		
352	2	Printer (Medium/Small)	100	No		
Corridor 3	2	Printer (Medium/Small)	100	No		
Main Offices	1	Printer (Medium/Small)	100	No		
343	2	Printer (Medium/Small)	100	No		
Lounge 7	2	Printer/Copier (Large)	150	No		
Multipurpose 5	2	Printer/Copier (Large)	150	No		
251A	1	Printer/Copier (Large)	150	No		
Corridor 3	3	Printer/Copier (Large)	150	No		
Main Offices	2	Printer/Copier (Large)	150	No		
103	1	Refrigerator (Mini)	250	No		
105	1	Refrigerator (Mini)	250	No		
111	1	Refrigerator (Mini)	250	No		
116	1	Refrigerator (Mini)	250	No		
132	1	Refrigerator (Mini)	250	No		

	Existing Conditions					
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?	Manufacturer	Model
Kitchen 1	1	Refrigerator (Mini)	250	No		
Locksmith	1	Refrigerator (Mini)	250	No		
Lounge 7	2	Refrigerator (Mini)	250	No		
Mechanical 1	1	Refrigerator (Mini)	250	No		
Lounge 7	16	Refrigerator (Residential)	450	No		
Multipurpose 3	1	Refrigerator (Residential)	450	No		
Multipurpose 5	2	Refrigerator (Residential)	450	No		
242	1	Refrigerator (Residential)	450	No		
352	1	Refrigerator (Residential)	450	No		
Corridor 3	3	Refrigerator (Residential)	450	No		
Lounge 6	1	Refrigerator (Residential)	450	No		
Main Offices	2	Refrigerator (Residential)	450	No		
343	1	Refrigerator (Residential)	450	No		
Mechanical 1	2	Refrigerator (Residential)	450	No		
Multiple Rooms	102	Television	200	No		
Kitchen 1	1	Toaster Oven	1,200	No		
Lounge 7	1	Toaster Oven	1,200	No		
Multipurpose 4	1	Water Cooler	250	No		
Multipurpose 5	1	Water Cooler	250	No		
352	1	Water Cooler	250	No		
343	1	Water Cooler	250	No		
Mechanical 1	2	Water Cooler	250	No		

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	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
Lounge 7	1	Non-Refrigerated	17	Yes	0.0	343	0	$48	$230	$0	4.8
Lounge 7	1	Refrigerated	17	Yes	0.2	1,612	0	$226	$230	$50	0.8

APPENDIX B: ENERGY STAR STATEMENT OF ENERGY PERFORMANCE

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

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ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

DHS - Green Brook Regional Center

Primary Property Type: Residential Care Facility
Gross Floor Area (ft²): 145,000
Built: 1964

For Year Ending: December 31, 2022
Date Generated: July 25, 2023

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
DHS - Green Brook Regional Center 275 Green Brook Road Green Brook, New Jersey 08812	State of New Jersey 428 East State Street Trenton, NJ 08625 (609) 940-4129	New Jersey Board of Public Utilities State Energy Services 44 South Clinton Ave Trenton, NJ 08625 6096339666 BPU.EnergyServices@bpu.nj.gov

Property ID: 25426936

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
163.5 kBtu/ft²

Source EUI
271.8 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	15,404,794 (65%)
Electric - Grid (kBtu)	8,299,066 (35%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	64.7
National Median Source EUI (kBtu/ft²)	107.5
% Diff from National Median Source EUI	153%

Annual Emissions

Total (Location-Based) GHG Emissions (Metric Tons CO2e/year)	1,541

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: ADDITIONAL SCOPE

Summary

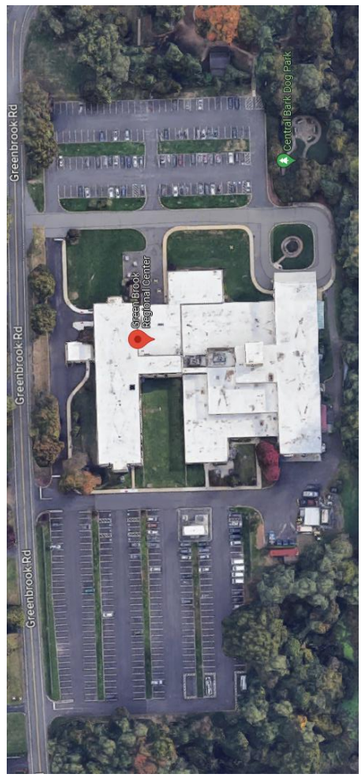
Solar kW	Battery kWh
361	300

DER	Gross Project Cost ($)	Energy Generation (kWh)	Demand Reduction (kW)	GHG Reduction (MT CO2)	Total Annual Utility Cost Savings ($/yr)	New Maintenance Penalty ($/yr)	Net Annual Cost Savings ($/yr)	Incentives (ITC) ($)	Depreciation (MACRS) ($)	Net Project Cost ($)	Net Simple Payback (yr)
361 kW Solar PV	$2,036,758	482,612	0	96.0	$63,326	$10,184	$53,142	$611,028	$509,190	$916,541	17.2
300 kWh Battery	$365,242	0	37	0.0	$1,576	$913	$663	$109,572	$91,310	$164,359	247.8
Total	$2,402,000	482,612	37	96.0	$64,902	$11,097	$53,805	$720,600	$600,500	$1,080,900	20.1

PPA Alternative:	-$1,341

Annual Utility Savings

Baseline kWh	2,450,323
Saved kWh	482,612
% NZE	20%
NZE Solar Size kW	1833



Equipment	Estimated Max Demand Savings (kW)	Estimated Annual Energy Generation (kWh)	Estimated Annual GHG Reduction ($MT\text{-}CO_2e$)	Estimated Annual Cost Savings ($)	Estimated Gross Project Cost ($)	Total Incentives ($)	Net Project Cost ($)	Simple Payback Period (yr)
361 kW Solar PV	0	482,612	96	$53,142	$2,036,758	$1,120,217	$916,541	17.2
300 kWh Battery	37	0	0	$663	$365,242	$200,883	$164,359	247.8
Total	37	482,612	96	$53,805	$2,402,000	$1,321,100	$1,080,900	20.1

Ownership Plan	Upfront Cost	Year 1 Cost After Rebates	Annual Savings	Lifetime 30-Year Cost Savings ($)	30-Year ROI
Cash Purchase	$2,402,000	$1,080,900	$53,805	$1,614,163	149%
PPA	$0	$0	($1,341)	($40,239)	-

Equipment	Estimated Gross Project Cost ($)	ITC Rebate	MACRS Rebate	Net Project Cost
361 kW Solar PV	$2,036,758	$611,028	$509,190	$916,541
300 kWh Battery	$365,242	$109,572	$91,310	$164,359
Total	$2,402,000	$720,600	$600,500	$1,080,900

Costing

New PV + BESS

System Description	Qty	Unit	Equipment Cost per Unit ($)	Labor Cost Per Unit ($)	Material Cost Per Unit ($)	Total Material Cost ($)	Total Equipment Cost ($)	Total Labor Cost ($)	Total Cost ($)	Source	Notes
Solar Array											
PV Modules (LG 400 W)	361,000	Watts DC			$ 0.45	$ 162,450	$ -	$ -	$ 162,450	PV size from ETB, cost from NREL report	https://www.nrel.gov/docs/fy22osti/83586.pdf
Inverter, 24 kW	12	Ea.		$ 400	$ 4,300	$ 51,600	$ -	$ 19,219	$ 70,819	Inverter size from Helioscope - Cost from online quote Labor - 4 Hrs Electrician per unit	https://sunwatts.com/24kw-fronius-symo-advanced-24-0-3-480v-3-phase-string-inverter/
Carport Structure and Racking Cost/Labor/Installation	361,000	Watts DC		$ 1.21	$ 1.00	$ 361,000	$ -	$ 437,207	$ 798,207	Energy ToolBase	
PV String Combiner Panels	8	Ea.		$ 100.10	$ 568	$ 4,263	$ -	$ 1,502	$ 5,765	Online Quote Labor - 1 Hrs Electrician per unit	https://www.solaris-shop.com/sma-cu1000-us-11-string-combiner-w-disconnect/ Each 1000V combiner box with disconnet switch can accommodate 8 strings total Project site hasup to 70 strings
Electrical BOS Carpot	2,285	m^2	$ -	$ -	$ 50.00	$ 114,250	$ -	$ -	$ 114,250	assumed the same cost as the ground mounted https://www.nrel.gov/docs/fy22osti/83586.pdf	U.S. Solar Photovoltaic System and Energy Storage Cost Benchmarks, With Minimum Sustainable Price Analysis: Q1 2022
Carport Linear LED Surface Mount Lighting Fixture	11	Ea.		$ 100.10	$ 61.83	$ 706	$ -	$ 1,144	$ 1,850	RS Means Line #: 26 51 13 44 2010 https://www.1000bulbs.com/product/217486/PLT-90093.html	(1) Electrican to install
Installation rental equipment carport	2,285	m^2	$ 14.60	$ -	$ -	$ -	$ 33,361	$ -	$ 33,361	assumed the same cost as the ground mounted https://www.nrel.gov/docs/fy22osti/83586.pdf	U.S. Solar Photovoltaic System and Energy Storage Cost Benchmarks, With Minimum Sustainable Price Analysis: Q1 2022
Battery Storage System											
Li-ion Battery + cabinet	300	kWh		$ -	$ 393	$ 117,900	$ -	$ -	$ 117,900	https://www.nrel.gov/docs/fy22osti/83586.pdf	U.S. Solar Photovoltaic System and Energy Storage Cost Benchmarks, With Minimum Sustainable Price Analysis: Q1 2022
Battery Installation - Labor and equipment	300	kWh		$ 265	$ -	$ -	$ -	$ 79,500	$ 79,500	https://www.nrel.gov/docs/fy22osti/83586.pdf	U.S. Solar Photovoltaic System and Energy Storage Cost Benchmarks, With Minimum Sustainable Price Analysis: Q1 2022 2.91 hrs @ RS Means labor rate
Electrical BOS	300	kWh	$ -	$ -	$ 69	$ 20,749	$ -	$ -	$ 20,500	https://www.nrel.gov/docs/fy22osti/83586.pdf	
Trenching/Site Prep and Wiring											
Schedule 80 PVC Piping 6" Diameter	100	LF	$ -	$ 45	$ 53.00	$ 5,300	$ -	$ 4,524	$ 9,824	RS means - 221113742560	

Trenching and Backfill 12" wide, 36" Deep	2	Day.	$ 425	$ 1,836.40	$ -	$ -	$ 850	$ 3,673	$ 4,523	Includes B-54 Crew - reference 312316142850	(2) Days of work (2) Laborers (1) 40 HP Chain Trencher (1) Light Equip Operator
Soil Excavation, Removal, loading, and hauling	50	L.C.Y	$ 6.8	$ 6.15	$ -	$ -	$ 339	$ 308	$ 647	Includes B-34D Crew - reference 312323204304	Includes (1) Truck Driver (1) Truck Tractor (1) Dump Trailer
Backfill and Asphalt Paving 8" Thick	1	Day.	$ 3,428	$ 6,777.20	$ 30.00	$ 3,213	$ 3,428	$ 6,777	$ 13,418	Includes B-25 Crew - reference 32 11 26 13 0560	1 Day of Filling Trench and Repaving Asphalt Includes (1) Labor Foreman (7) Laborers (3) Equipment Operators (1) Asphalt Paver, 130 H.P. (1) Tandem Roller, 10 Ton (1) Roller, Pneum. Wheel, 12 Ton
Other Costs											
New ATS - 1200 Amp	1	Ea.		$ 1,182.00	$ 23,339.20	$ 23,339	$ -	$ 1,182	$ 24,521	RS means - 263623100070	
Permitting, inspection, and interconnection	1	Ea.	$ 6,377	$ -			$ 6,377	$ -	$ 6,377	https://www.nrel.gov/docs/fy22osti/83586.pdf	For construction permits fee, interconnection study fees for existing substation, testing, and commissioning For standalone systems - (Rooftop - $105/kW-DC, Ground mount - $46/kW-DC, Battery - $13.6/kWh) For PV+Storage combined - Battery PII*1.02 = $20.84/kWh*1.02
User Training	8	Hr.	$ -	$ 150	$ -	$ -	$ -	$ 1,200	$ 1,200		
Total						**$ 868,800**	**$ 44,400**	**$ 560,200**	**$ 1,465,111**		

Markup	Cost
System Cost	$1,465,111
Tax (6.625%)	$57,558
O&P Cost (10%)	$146,511
EPC Markup (10%)	$146,511
Contingency (30%)	$439,533
2023 Inflation Markup (10%)	$146,511
Total Cost	$2,402,000

Battery Cost	$357,240	
Solar Cost	$1,992,136	
Electrical Upgrades, Permitting and Misc…	$52,624	
Battery Cost with Elec Upgrades	$365,242	$1,217
Solar Cost with Elec Upgrades	$2,036,758	$5.64

PPA Analysis

	Income			Net		
Year	Cash Purchase	Standard PPA	PPA with Year 10 Buyout	Cash Purchase	Standard PPA	PPA with Year 10 Buyout
0	-$1,080,900	$0	$0	-$1,080,900	$0	$0
1	$53,805	-$1,341	-$1,341	-$1,027,095	-$1,341	-$1,341
2	$53,805	-$1,341	-$1,341	-$973,289	-$2,683	-$2,683
3	$53,805	-$1,341	-$1,341	-$919,484	-$4,024	-$4,024
4	$53,805	-$1,341	-$1,341	-$865,678	-$5,365	-$5,365
5	$53,805	-$1,341	-$1,341	-$811,873	-$6,706	-$6,706
6	$53,805	-$1,341	-$1,341	-$758,067	-$8,048	-$8,048
7	$53,805	-$1,341	-$1,341	-$704,262	-$9,389	-$9,389
8	$53,805	-$1,341	-$1,341	-$650,457	-$10,730	-$10,730
9	$53,805	-$1,341	-$1,341	-$596,651	-$12,072	-$12,072
10	$53,805	-$1,341	-$1,341	-$542,846	-$13,413	-$13,413
11	$53,805	-$1,341	-$555,042	-$489,040	-$14,754	-$568,455
12	$53,805	-$1,341	$53,805	-$435,235	-$16,095	-$514,650
13	$53,805	-$1,341	$53,805	-$381,429	-$17,437	-$460,844
14	$53,805	-$1,341	$53,805	-$327,624	-$18,778	-$407,039
15	$53,805	-$1,341	$53,805	-$273,819	-$20,119	-$353,233
16	$53,805	-$1,341	$53,805	-$220,013	-$21,461	-$299,428
17	$53,805	-$1,341	$53,805	-$166,208	-$22,802	-$245,623
18	$53,805	-$1,341	$53,805	-$112,402	-$24,143	-$191,817
19	$53,805	-$1,341	$53,805	-$58,597	-$25,484	-$138,012
20	$53,805	-$1,341	$53,805	-$4,791	-$26,826	-$84,206
21	$53,805	-$1,341	$53,805	$49,014	-$28,167	-$30,401
22	$53,805	-$1,341	$53,805	$102,819	-$29,508	$23,405
23	$53,805	-$1,341	$53,805	$156,625	-$30,850	$77,210
24	$53,805	-$1,341	$53,805	$210,430	-$32,191	$131,015
25	$53,805	-$1,341	$53,805	$264,236	-$33,532	$184,821
26	$53,805	-$1,341	$53,805	$318,041	-$34,874	$238,626
27	$53,805	-$1,341	$53,805	$371,847	-$36,215	$292,432
28	$53,805	-$1,341	$53,805	$425,652	-$37,556	$346,237
29	$53,805	-$1,341	$53,805	$479,457	-$38,897	$400,043
30	$53,805	-$1,341	$53,805	$533,263	-$40,239	$453,848

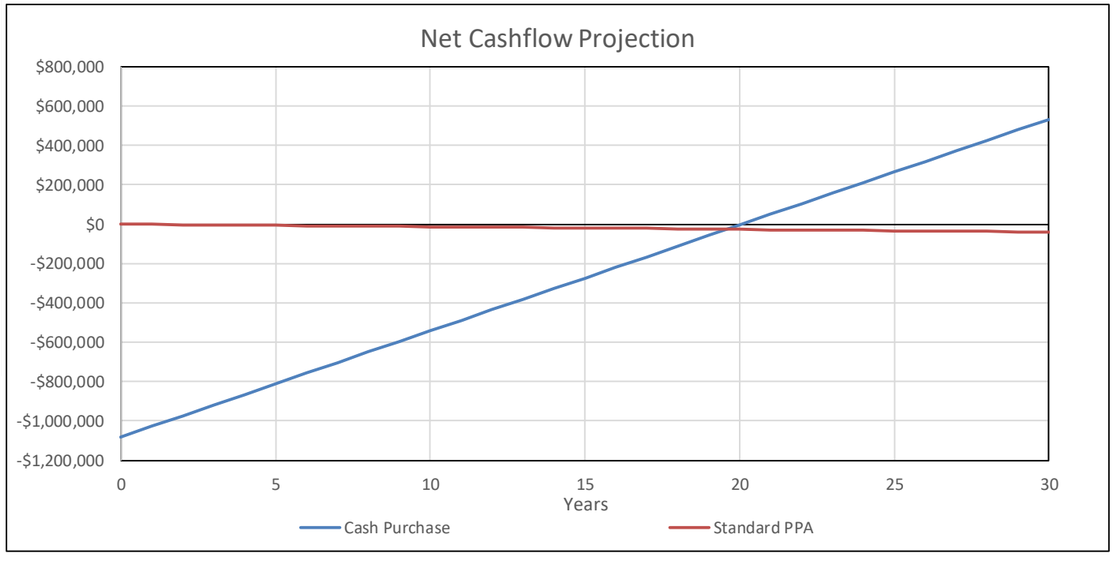
Cash Purchase	
Gross Project Cost	$2,402,000
Rebates	-$720,600
85% Depreciation	-$600,500
n/a	$0
Final Cost	$1,080,900
Utility Savings	$53,805
Payback	20.1
Financial Life (yr)	30
ROI (Over EUL)	149%

Battery Cost: $365,242
Solar Cost: $2,036,758

Standard PPA	
Gross Project Cost	$2,402,000
Rebates	-$720,600
85% Depreciation	-$600,500
n/a	$0
Final Cost	$1,080,900
Financial Life (yr)	30
Interest Rate	3.0%
Annual Income from Loan	$55,147
Utility Savings	$53,805
Annual Savings	-$1,341

Battery Cost: $365,242
Solar Cost: $2,036,758

PPA with Year 10 Buyout	
Gross Project Cost	$2,402,000
Rebates	-$720,600
85% Depreciation	-$600,500
n/a	$0
Final Cost	$1,080,900
Financial Life (yr)	30
Interest Rate	3.0%
Years 1-10	
Contractor's Income	$55,147
Utility Savings	$53,805
Customer Savings	-$1,341
Years 11-30	
Contractor O&P	15%
Buyout Cost	$608,848
Utility Savings	$53,805
Year 11-25 Payback	11.3
Lifetime Savings	$1,062,696
ROI (Over RUL)	175%



ETB Outputs

					Raw Utility Info				16% Cost Markup			
Bill Date Ranges			Energy Before PV/ESS (kWh)	Max Demand Before PV/ESS (kW)	Charges Before PV/ESS ($)				Charges Before PV/ESS ($)			
Start Date	End Date	Season	Total	NC / Max	Other	Energy	Demand	Total	Other	Energy	Demand	Total
1/5/2022	2/3/2022	W	217269	418	370.81	23160.88	1572.39	25104.08	430.1396	26866.62	1823.9724	29120.73
2/3/2022	3/7/2022	W	221072	408	370.81	23566.28	1534.77	25471.86	430.1396	27336.88	1780.3332	29547.36
3/7/2022	4/5/2022	W	190880	387	370.81	20347.81	1455.78	22174.4	430.1396	23603.46	1688.7048	25722.3
4/5/2022	5/5/2022	W	199293	392	370.81	21244.63	1474.59	23090.03	430.1396	24643.77	1710.5244	26784.43
5/5/2022	6/1/2022	W	177509	385	312.87	18922.46	1221.96	20457.3	362.9292	21950.05	1417.4736	23730.47
6/1/2022	6/6/2022	S	31761	385	57.94	3385.72	761.96	4205.62	67.2104	3927.435	883.8736	4878.519
6/6/2022	7/6/2022	S	198792	385	370.81	21191.23	4876.53	26438.56	430.1396	24581.83	5656.7748	30668.73
7/6/2022	8/4/2022	S	189874	385	370.81	20240.57	4876.53	25487.9	430.1396	23479.06	5656.7748	29565.96
8/4/2022	9/2/2022	S	196403	390	370.81	20936.56	4939.86	26247.23	430.1396	24286.41	5730.2376	30446.79
9/2/2022	10/1/2022	S	186682	370	336.05	19900.3	4247.17	24483.52	389.818	23084.35	4926.7172	28400.88
10/1/2022	10/4/2022	W	19312	370	34.76	2058.66	130.48	2223.91	40.3216	2388.046	151.3568	2579.736
10/4/2022	11/2/2022	W	181031	367	370.81	19297.9	1380.54	21049.26	430.1396	22385.56	1601.4264	24417.14
11/2/2022	12/3/2022	W	202545	392	370.81	21591.3	1474.59	23436.69	430.1396	25045.91	1710.5244	27186.56
12/3/2021	1/5/2022	W	237900	418	370.81	25360.14	1572.39	27303.34	430.1396	29417.76	1823.9724	31671.87
Total			2450323		4449.72	261204.43	31519.53	297173.68	5161.6752	302997.1	36562.6548	344721.5
Adjustments			0		0	0	0	0	0	0	0	0
Total			2450323		4449.72	261204.43	31519.53	297173.68	5161.6752	302997.1	36562.6548	344721.5
Bill Date Ranges			Energy After PV & Before ESS (kWh)	Max Demand After PV & Before ESS (kW)	Charges After PV & Before ESS ($)				Charges After PV & Before ESS ($)			
Start Date	End Date	Season	Total	NC / Max	Other	Energy	Demand	Total	Other	Energy	Demand	Total
1/5/2022	2/3/2022	W	193380	414	370.81	20614.31	1557.34	22542.46	430.1396	23912.6	1806.5144	26149.25
2/3/2022	3/7/2022	W	183913	379	370.81	19605.13	1425.68	21401.62	430.1396	22741.95	1653.7888	24825.88
3/7/2022	4/5/2022	W	148482	362	370.81	15828.18	1361.74	17560.73	430.1396	18360.69	1579.6184	20370.45
4/5/2022	5/5/2022	W	148426	354	370.81	15822.21	1331.64	17524.66	430.1396	18353.76	1544.7024	20328.61
5/5/2022	6/1/2022	W	132997	336	312.87	14177.48	1066.44	15556.79	362.9292	16445.88	1237.0704	18045.88
6/1/2022	6/6/2022	S	22974	288	57.94	2449.03	569.98	3076.95	67.2104	2840.875	661.1768	3569.262
6/6/2022	7/6/2022	S	147447	330	370.81	15717.85	4179.88	20268.54	430.1396	18232.71	4848.6608	23511.51
7/6/2022	8/4/2022	S	134546	337	370.81	14342.6	4268.54	18981.96	430.1396	16637.42	4951.5064	22019.07
8/4/2022	9/2/2022	S	153205	348	370.81	16331.65	4407.87	21110.34	430.1396	18944.71	5113.1292	24487.99
9/2/2022	10/1/2022	S	144935	333	336.05	15450.07	3822.45	19608.57	389.818	17922.08	4434.042	22745.94
10/1/2022	10/4/2022	W	15654	343	34.76	1668.72	120.96	1824.44	40.3216	1935.715	140.3136	2116.35
10/4/2022	11/2/2022	W	149416	340	370.81	15927.75	1278.98	17577.53	430.1396	18476.19	1483.6168	20389.93
11/2/2022	12/3/2022	W	177245	375	370.81	18894.32	1410.64	20675.76	430.1396	21917.41	1636.3424	23983.88
12/3/2021	1/5/2022	W	215091	418	370.81	22928.7	1572.39	24871.9	430.1396	26597.29	1823.9724	28851.4
Subtotal			1967711		4449.72	209757.99	28374.55	242582.26	5161.6752	243319.3	32914.478	281395.4
Adjustments			0		0	0	0	0	0	0	0	0
Total			1967711		4449.72	209757.99	28374.55	242582.26	5161.6752	243319.3	32914.478	281395.4
Bill Date Ranges			Energy After PV/ESS (kWh)	Max Demand After PV/ESS (kW)	Charges After PV/ESS ($)				Charges After PV/ESS ($)			
Start Date	End Date	Season	Total	NC / Max	Other	Energy	Demand	Total	Other	Energy	Demand	Total
1/5/2022	2/3/2022	W	194515	381	370.81	20735.3	1433.21	22539.32	430.1396	24052.95	1662.5236	26145.61
2/3/2022	3/7/2022	W	185028	348	370.81	19723.98	1309.07	21403.87	430.1396	22879.82	1518.5212	24828.49
3/7/2022	4/5/2022	W	149510	326	370.81	15937.77	1226.31	17534.89	430.1396	18487.81	1422.5196	20340.47
4/5/2022	5/5/2022	W	149331	326	370.81	15918.68	1226.31	17515.81	430.1396	18465.67	1422.5196	20318.34
5/5/2022	6/1/2022	W	133703	306	312.87	14252.74	971.22	15536.83	362.9292	16533.18	1126.6152	18022.72
6/1/2022	6/6/2022	S	23156	256	57.94	2468.43	506.65	3033.02	67.2104	2863.379	587.714	3518.303
6/6/2022	7/6/2022	S	148281	300	370.81	15806.75	3799.89	19977.45	430.1396	18335.83	4407.8724	23173.84
7/6/2022	8/4/2022	S	135358	305	370.81	14429.16	3863.22	18663.19	430.1396	16737.83	4481.3352	21649.3
8/4/2022	9/2/2022	S	154006	317	370.81	16417.04	4015.22	20803.07	430.1396	19043.77	4657.6552	24131.56
9/2/2022	10/1/2022	S	145815	300	336.05	15543.88	3443.65	19323.58	389.818	18030.9	3994.634	22415.35
10/1/2022	10/4/2022	W	15739	325	34.76	1677.78	114.61	1827.16	40.3216	1946.225	132.9476	2119.506
10/4/2022	11/2/2022	W	150516	308	370.81	16045.01	1158.6	17574.42	430.1396	18612.21	1343.976	20386.33
11/2/2022	12/3/2022	W	178372	346	370.81	19014.46	1301.55	20686.81	430.1396	22056.77	1509.798	23996.7
12/3/2021	1/5/2022	W	216183	369	370.81	23045.11	1388.07	24803.99	430.1396	26732.33	1610.1612	28772.63
Subtotal			1979513		4449.72	211016.09	25757.6	0	5161.6752	244778.7	29878.816	0
Adjustments			0		0	0	0	0	0	0	0	0
Total			1979513		4449.72	211016.09	25757.6	241223.4	5161.6752	244778.7	29878.816	279819.1

PV SYSTEM DETAILS

GENERAL INFORMATION
Facility: Meter #1
Address: 3084 17th St SF CA 94110

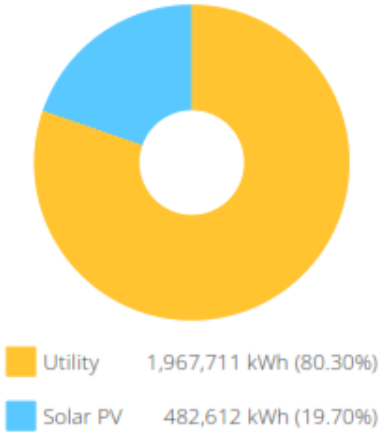
SOLAR PV EQUIPMENT DESCRIPTION
Solar Panels: (902) LG Electronics LG400N2W-V5_R12
Inverters: (12) SMA Sunny Tripower 24000TL-US

SOLAR PV EQUIPMENT TYPICAL LIFESPAN
Solar Panels: Greater than 30 Years
Inverters: 15 Years

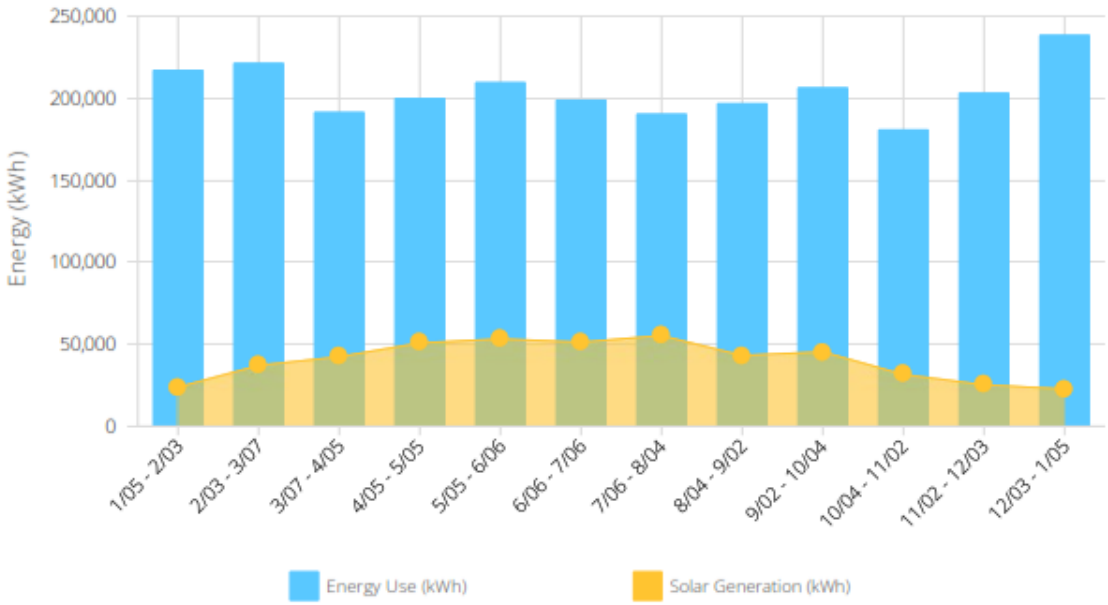
Solar PV System Cost and Incentives	
Solar PV System Cost	$1,751,843
Net Solar PV System Cost	**$1,751,843**

SOLAR PV SYSTEM RATING
Power Rating: 360,800 W-DC
Power Rating: 307,799 W-AC-CEC

ENERGY CONSUMPTION MIX
Annual Energy Use: 2,450,323 kWh



MONTHLY ENERGY USE VS SOLAR GENERATION



energy toolbase

ENERGY STORAGE SYSTEM (ESS) DETAILS

GENERAL INFORMATION

Facility: Meter #1
Address: SF CA 94110

ESS EQUIPMENT DESCRIPTION

Battery Banks: 300kw/300kWh Energy Storage System
Inverters: 300kw/300kWh Energy Storage System

ESS EQUIPMENT TYPICAL LIFESPAN

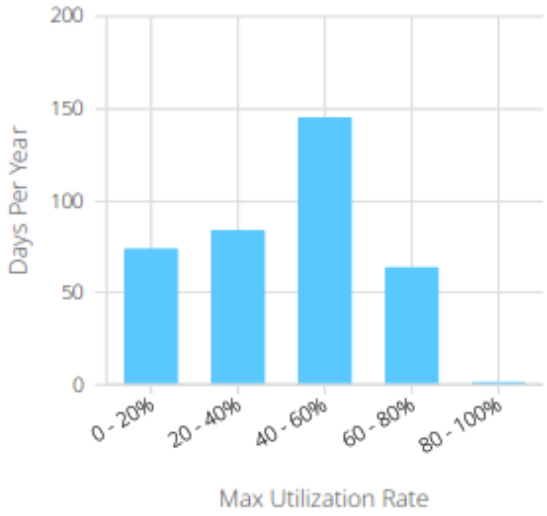
Battery Banks: 15 Years
Inverters: 15 Years

ESS Cost and Incentives	
ESS Cost	$666,459
Net ESS Cost	**$666,459**

ESS SYSTEM RATINGS

Energy Capacity: 300.0 kWh
Power Rating: 300.0 kW

ENERGY STORAGE ANNUAL UTILIZATION



Energy Output and Demand Savings From Solar PV and Energy Storage				
Date Range	ESS Energy Discharge (kWh)	Solar PV Generation (kWh)	ESS Energy as % of PV Energy	Total Demand Savings
1/5/2022 - 2/3/2022	2,954	23,889	12.37%	$139
2/3/2022 - 3/7/2022	2,902	37,159	7.81%	$226
3/7/2022 - 4/5/2022	2,678	42,398	6.32%	$229
4/5/2022 - 5/5/2022	2,356	50,867	4.63%	$248
5/5/2022 - 6/6/2022	2,315	53,299	4.34%	$506
6/6/2022 - 7/6/2022	2,173	51,345	4.23%	$1,077
7/6/2022 - 8/4/2022	2,116	55,328	3.82%	$1,013
8/4/2022 - 9/2/2022	2,086	43,198	4.83%	$925
9/2/2022 - 10/4/2022	2,511	45,404	5.53%	$819
10/4/2022 - 11/2/2022	2,915	31,615	9.22%	$222
11/2/2022 - 12/3/2022	2,924	25,300	11.56%	$173
12/3/2021 - 1/5/2022	2,843	22,810	12.46%	$184
Total	30,773	482,612	6.38%	$5,762

ENVIRONMENTAL BENEFITS

OVER THE NEXT 20 YEARS, YOUR SYSTEM WILL DO MORE THAN JUST SAVE YOU MONEY. ACCORDING TO THE EPA'S GREENHOUSE GAS EQUIVALENCIES CALCULATOR (SOURCE), YOUR SOLAR PV SYSTEM WILL HAVE THE IMPACT OF REDUCING:

7,563

tons of CO2 Offset

17,190,639

Miles Driven By Cars

113,414

Trees Planted

energytoolbase

APPENDIX D: 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 (II)	*Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array.
T5, T8, T12	A reference to a linear lamp diameter. The number represents increments of 1/8th of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use.
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense®	The symbol for water efficiency. The WaterSense® program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.