Local Government Energy Audit:
Energy Audit Report

Brookdale Administration Center

Brookdale Community College

765 Newman Springs Road

Lincroft, NJ 07738

March 26, 2018

Final Report by:

TRC Energy Services

Disclaimer

The intent of this energy analysis report is to identify energy savings opportunities and recommend upgrades to the facility's energy using equipment and systems. Approximate saving are included in this report to help make decisions about reducing energy use at the facility. This report, however, is not intended to serve as a detailed engineering design document. Further design and analysis may be necessary in order to implement some of the measures recommended in this report.

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

Estimated installation costs are based on TRC's experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from *RS Means*. The owner of the facility is encouraged to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Since actual installed costs can vary widely for certain measures and conditions, TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

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

Table of Contents

1 Executive Summary 1

1.1 Facility Summary 1
1.2 Your Cost Reduction Opportunities 1

Energy Conservation Measures 1
Energy Efficient Practices 3
On-Site Generation Measures 3

1.3 Implementation Planning 4

2 Facility Information and Existing Conditions 5

2.1 Project Contacts 5
2.2 General Site Information 5
2.3 Building Occupancy 5
2.4 Building Envelope 6
2.5 On-Site Generation 6
2.6 Energy-Using Systems 6

Lighting System 6
Hot Water Heating System 7
Air Conditioning System 7
Domestic Hot Water Heating System 8
Building Plug Load 8

2.7 Water-Using Systems 8

3 Site Energy Use and Costs 9

3.1 Total Cost of Energy 9
3.2 Electricity Usage 10
3.3 Natural Gas Usage 11
3.4 Benchmarking 12
3.5 Energy End-Use Breakdown 14

4 Energy Conservation Measures 15

4.1 Recommended ECMs 15
4.1.1 Lighting Upgrades 16

ECM 1: Install LED Fixtures 16
ECM 2: Retrofit Fixtures with LED Lamps 17
ECM 3: Install LED Exit Signs 17

4.1.2 Lighting Control Measures 18

ECM 4: Install Occupancy Sensor Lighting Controls 18
ECM 5: Install High/Low Lighting Controls 19

4.1.3 HVAC System Upgrades 20

ECM 6: Install Dual-Enthalpy Economizers 20

4.1.4 Domestic Hot Water Heating System Upgrades 21

ECM 7: Install Low-Flow DHW Devices 21
4.1.5 Plug Load Equipment Control - Vending Machines 22
ECM 8: Vending Machine Control 22
4.2 ECMs Evaluated But Not Recommended 23
Install High Efficiency Air Conditioning Units 23
Install High Efficiency Furnaces 24
5 Energy Efficient Practices 25
Reduce Air Leakage 25
Close Doors and Windows 25
Perform Proper Lighting Maintenance 25
Develop a Lighting Maintenance Schedule 25
Ensure Lighting Controls Are Operating Properly 25
Turn Off Unneeded Motors 26
Reduce Motor Short Cycling 26
Perform Routine Motor Maintenance 26
Use Fans to Reduce Cooling Load 26
Practice Proper Use of Thermostat Schedules and Temperature Resets 26
Clean Evaporator/Condenser Coils on AC Systems 26
Clean and/or Replace HVAC Filters 26
Check for and Seal Duct Leakage 27
Perform Proper Boiler Maintenance 27
Perform Proper Furnace Maintenance 27
Perform Proper Water Heater Maintenance 27
Plug Load Controls 27
Water Conservation 28
6 On-Site Generation Measures 29
6.1 Photovoltaic 29
6.2 Combined Heat and Power 30
7 Demand Response 32
8 Project Funding / Incentives 33
8.1 SmartStart 34
8.2 SREC Registration Program 35
8.3 Energy Savings Improvement Program 35
8.4 Demand Response Energy Aggregator 36
9 Energy Purchasing and Procurement Strategies 37
9.1 Retail Electric Supply Options 37
9.2 Retail Natural Gas Supply Options 37

Appendix A: Equipment Inventory & Recommendations

Appendix B: ENERGY STAR® Statement of Energy Performance

Table of Figures

Figure 1 – Previous 12 Month Utility Costs 1
Figure 2 – Potential Post-Implementation Costs 1
Figure 3 – Summary of Energy Reduction Opportunities 2
Figure 4 – Photovoltaic Potential 3
Figure 5 – Project Contacts 5
Figure 6 - Building Schedule 5
Figure 7 - Utility Summary 9
Figure 8 - Energy Cost Breakdown 9
Figure 9 -Electric Usage & Demand 10
Figure 10 -Electric Usage & Demand 10
Figure 11 -Natural Gas Usage 11
Figure 12 -Natural Gas Usage 11
Figure 13 - Energy Use Intensity Comparison – Existing Conditions 12
Figure 14 - Energy Use Intensity Comparison – Following Installation of Recommended Measures 12
Figure 15 - Energy Balance (kBtu/SF,%) 14
Figure 16 – Summary of Recommended ECMs 15
Figure 17 – Summary of Lighting Upgrade ECMs 16
Figure 18 – Summary of Lighting Control ECMs 18
Figure 19 - Summary of HVAC System Improvement ECMs 20
Figure 20 - Summary of Domestic Water Heating ECMs 21
Figure 21 – Summary of Measures Evaluated, But Not Recommended 23
Figure 22 - Photovoltaic Screening 29
Figure 23 - Combined Heat and Power Screening 31
Figure 24 - ECM Incentive Program Eligibility 33

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Brookdale Administration Center.

The goal of an LGEA report is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and provide information and assistance to help facilities implement ECMs. The LGEA report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

This study was conducted by TRC, as part of a comprehensive effort to assist New Jersey higher education institutions in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

1.1 Facility Summary

Brookdale Administration Center is a 31,115 square-foot facility comprised of various administrative offices within two buildings, which are connected by a walkway. Both buildings are two stories and were constructed in 1967. They serve as the college administrative services buildings. Interior lighting consists mainly of linear T8 fluorescent and compact fluorescent lamps (CFL). Cooling is provided by split systems and packaged air conditioners (AC). The heating system consists of one hot water boiler and several furnaces which are integral to the packaged AC units.

The building receives electric power via the campus main account with JCP&L. The building's estimated usage was prorated based on building function and size. A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated 10 measures including eight high priority which together represent an opportunity for Brookdale Administration Center to reduce annual energy costs by $7,095.07 and annual greenhouse gas emissions by 63,678 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in six years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce Brookdale Administration Center's annual energy use by 10%.

Figure 1 – Previous 12 Month Utility Costs

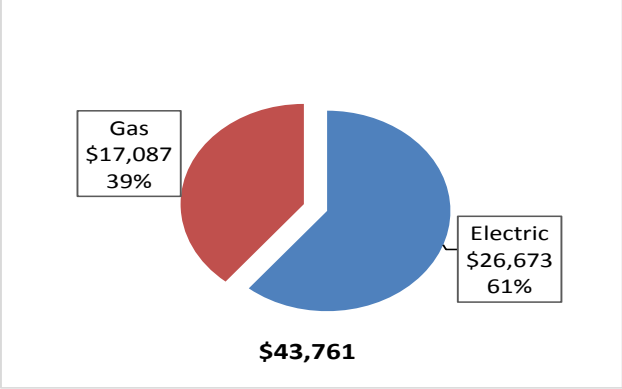
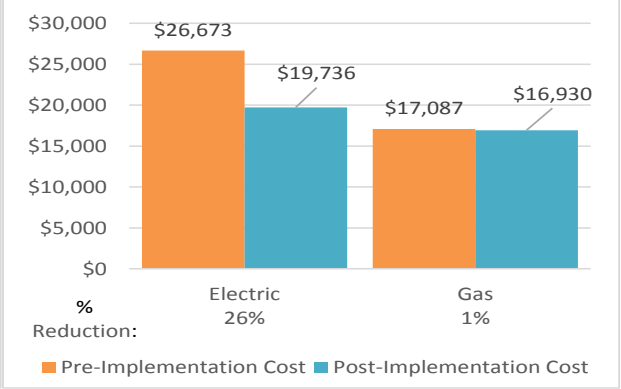


Figure 2 – Potential Post-Implementation Costs



A detailed description of Brookdale Administration Center's existing energy use can be found in Section 3.

Estimates of the total cost, energy savings, and financial incentives for the proposed energy efficient upgrades are summarized below in Figure 3. A brief description of each category can be found below and a description of savings opportunities can be found in Section 4.

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**36,284**	**10.9**	**0.0**	**$4,075.59**	**$36,461.18**	**$3,970.00**	**$32,491.18**	**8.0**	**36,538**
ECM 1	Install LED Fixtures	Yes	1,435	0.4	0.0	$161.21	$2,434.32	$20.00	$2,414.32	15.0	1,445
ECM 2	Retrofit Fixtures with LED Lamps	Yes	33,690	10.4	0.0	$3,784.25	$31,553.10	$3,950.00	$27,603.10	7.3	33,926
ECM 3	Install LED Exit Signs	Yes	1,159	0.1	0.0	$130.13	$2,473.77	$0.00	$2,473.77	19.0	1,167
Lighting Control Measures			**7,616**	**2.3**	**0.0**	**$855.42**	**$8,282.00**	**$670.00**	**$7,612.00**	**8.9**	**7,669**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	5,766	1.8	0.0	$647.62	$6,882.00	$670.00	$6,212.00	9.6	5,806
ECM 5	Install High/Low Lighitng Controls	Yes	1,850	0.6	0.0	$207.80	$1,400.00	$0.00	$1,400.00	6.7	1,863
Electric Unitary HVAC Measures			**13,779**	**11.4**	**0.0**	**$1,547.70**	**$92,429.89**	**$4,218.00**	**$88,211.89**	**57.0**	**13,875**
	Install High Efficiency Electric AC	No	13,779	11.4	0.0	$1,547.70	$92,429.89	$4,218.00	$88,211.89	57.0	13,875
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**112.3**	**$1,396.60**	**$16,993.00**	**$1,600.00**	**$15,393.00**	**11.0**	**13,145**
	Install High Efficiency Furnaces	No	0	0.0	112.3	$1,396.60	$16,993.00	$1,600.00	$15,393.00	11.0	13,145
HVAC System Improvements			**15,909**	**3.6**	**0.0**	**$1,786.93**	**$2,800.00**	**$1,000.00**	**$1,800.00**	**1.0**	**16,020**
ECM 6	Install Dual Enthalpy Outside Economizer Control	Yes	15,909	3.6	0.0	$1,786.93	$2,800.00	$1,000.00	$1,800.00	1.0	16,020
Domestic Water Heating Upgrade			**0**	**0.0**	**12.7**	**$157.61**	**$93.21**	**$0.00**	**$93.21**	**0.6**	**1,483**
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	12.7	$157.61	$93.21	$0.00	$93.21	0.6	1,483
Plug Load Equipment Control - Vending Machine			**1,954**	**0.0**	**0.0**	**$219.52**	**$460.00**	**$0.00**	**$460.00**	**2.1**	**1,968**
ECM 8	Vending Machine Control	Yes	1,954	0.0	0.0	$219.52	$460.00	$0.00	$460.00	2.1	1,968
TOTALS FOR PROPOSED MEASURES			**61,762**	**16.8**	**12.7**	**$7,095.07**	**$48,096.39**	**$5,640.00**	**$42,456.39**	**6.0**	**63,678**
TOTALS FOR ALL MEASURES			**75,541**	**28.2**	**124.9**	**$10,039.38**	**$157,519.28**	**$11,458.00**	**$146,061.28**	**14.5**	**90,698**

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

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

Lighting Upgrades generally involve the replacement of existing lighting components such as lamps and ballasts (or the entire fixture) with higher efficiency lighting components. These measures save energy by reducing the power used by the lighting components due to improved electrical efficiency.

Lighting Controls measures generally involve the installation of automated controls to turn off lights or reduce light output when not needed. Automated control reduces reliance on occupant behavior for adjusting lights. These measures save energy by reducing the amount of time lights are on.

Electric Unitary HVAC measures generally involve replacing older inefficient air conditioning systems with modern energy efficient systems. New air conditioning systems can provide equivalent cooling to older air condition systems at a reduced energy cost. These measures save energy by reducing the power used by the air conditioning systems, due to improved electrical efficiency.

Gas Heating (HVAC/Process) measures generally involve replacing older inefficient hydronic heating systems with modern energy efficient systems. Gas heating systems can provide equivalent heating compared to older systems at a reduced energy cost. These measures save energy by reducing the fuel demands for heating, due to improved combustion and heat transfer efficiency.

HVAC System Improvements generally involve the installation of automated controls to reduce heating and cooling demand during periods of reduced demand. These measures could encompass changing temperature setpoints, using outside air for free cooling, or limiting excessive outside air during extreme outdoor air temperature conditions. These measures save energy by reducing the demand on HVAC systems and the amount of time systems operate.

Domestic Hot Water upgrade measures generally involve replacing older inefficient domestic water heating systems with modern energy efficient systems. New domestic hot water heating systems can provide equivalent, or greater, water heating capacity compared to older systems at a reduced energy cost. These measures save energy by reducing the fuel used for domestic hot water heating due to improved heating efficiency or reducing standby losses.

Plug Load Equipment control measures generally involve installing automated devices that limit the power usage or operation of equipment that is plugged into an electric outlet when not in use.

Energy Efficient Practices

TRC also identified 18 low cost or no cost energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at Brookdale Administration Center include:

- Reduce Air Leakage
- Close Doors and Windows
- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Turn Off Unneeded Motors
- Reduce Motor Short Cycling
- Perform Routine Motor Maintenance
- Use Fans to Reduce Cooling Load
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Check for and Seal Duct Leakage
- Perform Proper Boiler Maintenance
- Perform Proper Furnace Maintenance
- Perform Proper Water Heater Maintenance
- Install Plug Load Controls
- Water Conservation

For details on these energy efficient practices, please refer to Section 5.

On-Site Generation Measures

TRC evaluated the potential for installing on-site generation for Brookdale Administration Center. Based on the configuration of the site and its loads there is a high potential for installing a photovoltaic (PV) array.

Figure 4 – Photovoltaic Potential

Potential	High	
System Potential	120	kW DC STC
Electric Generation	142,965	kWh/yr
Displaced Cost	$12,440	/yr
Installed Cost	$312,000	

For details on our evaluation and on-site generation potential, please refer to Section 6.

1.3 Implementation Planning

To realize the energy savings from the ECMs listed in this report, a project implementation plan must be developed. Available capital must be considered and decisions need to be made whether it is best to pursue individual ECMs separately, groups of ECMs, or a comprehensive approach where all ECMs are implemented together, possibly in conjunction with other facility upgrades or improvements.

Rebates, incentives, and financing are available from NJCEP, as well as other sources, to help reduce the costs associated with the implementation of energy efficiency projects. Prior to implementing any measure, please review the relevant incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives prior to purchasing materials or commencing with installation.

The ECMs outlined in this report may qualify under the following program(s):

- SmartStart
- Energy Savings Improvement Program (ESIP)

For facilities wanting to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate in this program, you may utilize internal resources, or an outside firm or contractor, to do the final design of the ECM(s) and do the installation. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation. The incentive estimates listed above in Figure 3 are based on the SmartStart program. More details on this program and others are available in Section 8.

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (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. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.3 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce 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. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability. By enabling grid operators to call upon commercial facilities to reduce their electric usage 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 DR programs. Program participation is voluntary and facilities receive payments whether or not they are called upon to curtail their load during times of peak demand. Refer to Section 7 for additional information on this program.

Additional information on relevant incentive programs is located in Section 8 or: www.njcleanenergy.com/ci.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Timothy Drury	Director of Facilities Management and Construction	tdrury@brookdalecc.edu	(732) 224-2217
Designated Representative			
Christopher Otis	Manager,Fire Safety & Environmental Compliance	cotis@brookdalecc.edu	(732) 224-2217
TRC Energy Services			
Moussa Traore	Auditor	mtraore@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On December 9, 2016, TRC performed an energy audit at Brookdale Administration Center located in Lincroft, New Jersey. TRC's auditor met with Christopher Otis to review the facility operations and help focus our investigation on specific energy-using systems.

Brookdale Administration Center is a 31,115 square-foot facility comprised of various administrative offices within two buildings, which are connected by a walkway. The facility houses the Office of the President, Human Resources, Administration and Operation, Business and Finance, Payroll, and Facility Management department offices.

The building receives electric power via the campus main account, with service provided by JCP&L. The building has no separate utility meters or submeters. The breakdown of energy usage is based on TRC's estimates of this building's share of the total electric and gas loads as well as number and sizes of the energy-using equipment on site.

TRC recommends installing electric submeters for all buildings fed from the campus main account, and metering the hot and chilled water flow to each building. The information gained from submeters would provide campus staff with a view of the relative energy and power demand required by each campus building.

2.3 Building Occupancy

The Brookdale Administrative Center is open year-round and the typical schedule is presented in the table below. During a typical day, the facility is occupied by approximately 90 people.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Brookdale Administration Center	Weekday	7:00 AM - 4:30 PM
Brookdale Administration Center	Weekend	Closed

2.4 Building Envelope

Both buildings are constructed of concrete block. Exterior walls are accented with vinyl siding and portions of the walls are accented with decorative stone block. Each facility section has a hip roof covered with asphalt shingles which appear to be in good condition.

The windows are glass double pane with metal framed and are in good condition as well. Exterior doors are glass and metal framed. Door and window seals appeared to be tight. No excessive air infiltration was noted.

2.5 On-Site Generation

Brookdale Administration Center does not have any on-site electric generation capacity.

2.6 Energy-Using Systems

Please see Appendix A: Equipment Inventory & Recommendations for an inventory of the facility's equipment.

Lighting System

Lighting at the facility is provided mostly by 3- Watt linear fluorescent T8 lamps with electronic ballasts as well as some 2-lamp, 13 Watt compact fluorescent lamps (CFL). Most of the fixtures are 2-lamp, 4-foot long troffers with diffusers. There are also some halogen incandescent and metal halide lamps. exit signs throughout the facility are fluorescent lamps. Interior lighting control is provided by manual wall switches.

Exterior walkway and parking lot lights have been accounted for as part of the Central Utility Plant energy consuming equipment.

Hot Water Heating System

The hot water system consists of one RBI non-condensing boiler with an output rating of 293 MBH and a nominal combustion efficiency of 84%. Hot water generated is distributed to one Carrier air handler equipped with hot water coils and to the vestibule area convectors by three 0.3 hp in-line pumps. The boiler is one year old and appears to be in good condition

Air Conditioning System

Two split system and five packaged air conditioners (AC) condition the facility. Two 20 ton and two 5-ton Carrier packaged AC with gas furnace sections serve the two buildings. The gas fired furnace sections have an output capacity of 283 MBH and 92 MBh respectively and provide heating as needed. The packaged units are approximately 13 years old and are at the end of their useful service life.

All the packaged units are located on the ground in the front of the buildings. One 23-ton Carrier air cooled unit in combination with one Carrier indoor air handler unit serve the second building. The server room has one 1.5 tons split AC and three tons water source heat pump. The split AC is 14 years old and appear in poor condition. The packaged and split systems are controlled by thermostats.

Domestic Hot Water Heating System

Domestic hot water (DHW) is provided by one Bradford White gas fired 40-gallon tank heater with an output rating of 40 MBh and a nominal efficiency of 82%, and one 80-gallon Rheem electric tank heater with an output rating of 4.5 kW. The Bradford White DH is one year old and located in the mechanical room while the 25 year-old Rheem DHW is located in the utility room.

Building Plug Load

The buildings have approximately 65 computers with LCD monitors that are used daily, plus servers, eight photocopiers, and some small printers. The computers, monitors, and printers seemed to be all recent models designed with power management software to reduce power them when the sit idle for more than a few minutes. The building has two vending machines located in the main lobby.

2.7 Water-Using Systems

There are several restrooms at this facility. A sampling of restrooms found that faucets are rated for 1.8 gallons per minute (gpm) or higher, the toilets are rated at 2.5 gallons per flush and the urinals are rated at 2 gallons per flush. There are no restrooms with showerheads.

3 SITE ENERGY USE AND COSTS

Nearly the entire campus receives electricity through a master electric meter. A large portion of the campus receives natural gas through a master gas meter. The main meters were prorated for individual buildings based on building size and function. It should be noted that the energy used by the Central Utility Plant is included in the proration to this building.

Prorated utility data for electricity and natural gas was evaluated to determine the annual energy performance metrics for the building in energy cost per square foot and energy usage per square foot. These metrics are an estimate of the relative energy efficiency of this building. There are a number of factors that could cause the energy use of this building to vary from the "typical" energy usage profile for facilities with similar characteristics. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and energy efficient behavior of occupants all contribute to benchmarking scores. Please refer to the Benchmarking section within Section 3.4 for additional information.

3.1 Total Cost of Energy

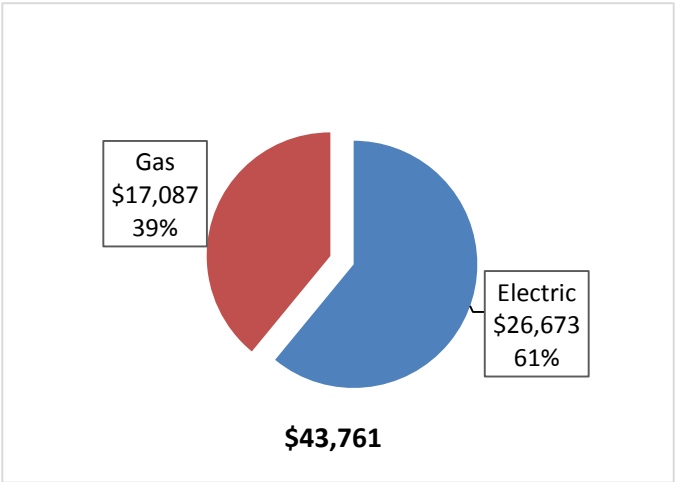
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for Brookdale Administration Center		
Fuel	**Usage**	**Cost**
Electricity	237,464 kWh	$26,673
Natural Gas	13,736 Therms	$17,087
Total		**$43,761**

The current annual energy cost for this facility is $43,761 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by JCP&L. It is supplied via the main electric account for the campus and distributed from the Central Plant to the Brookdale Administrative Center. The average electric cost over the past 12 months on the main account was $0.112/kWh. This is a blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly estimated electricity consumption and peak demand are shown in the chart below.

Figure 9 -Electric Usage & Demand

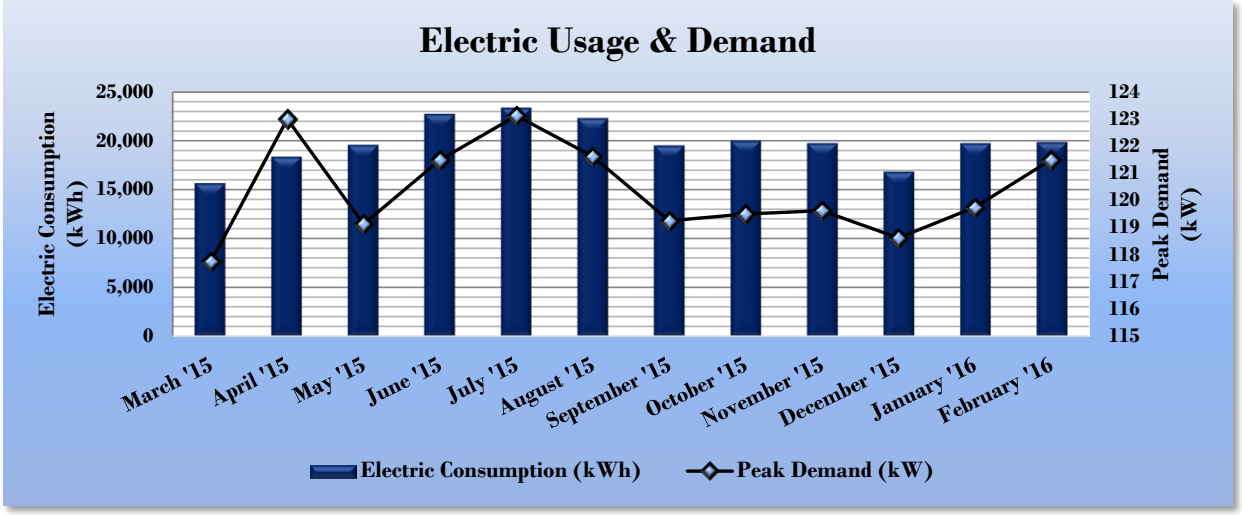


Figure 10 -Electric Usage & Demand

Electric Billing Data for Brookdale Administration Center					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Total Electric Cost	TRC Estimated Usage?
4/13/15	31	15,625	118	$1,755	Yes
5/12/15	30	18,346	123	$2,061	Yes
6/11/15	31	19,561	119	$2,197	Yes
7/13/15	30	22,723	122	$2,552	Yes
8/12/15	31	23,343	123	$2,622	Yes
9/11/15	31	22,282	122	$2,503	Yes
10/13/15	30	19,485	119	$2,189	Yes
11/12/15	31	19,988	120	$2,245	Yes
12/14/15	30	19,731	120	$2,216	Yes
1/13/16	31	16,824	119	$1,890	Yes
2/11/16	31	19,720	120	$2,215	Yes
3/11/16	28	19,835	122	$2,228	Yes
Totals	**365**	**237,464**	**123.125**	**$26,673**	12
Annual	**365**	**237,464**	**123.125**	**$26,673**	

3.3 Natural Gas Usage

Natural gas is provided by New Jersey Natural Gas. The average prorated gas cost for the past 12 months is $1.244/therm, which is the blended rate used throughout the analyses in this report. The monthly prorated gas consumption is shown in the chart below.

Figure 11 -Natural Gas Usage

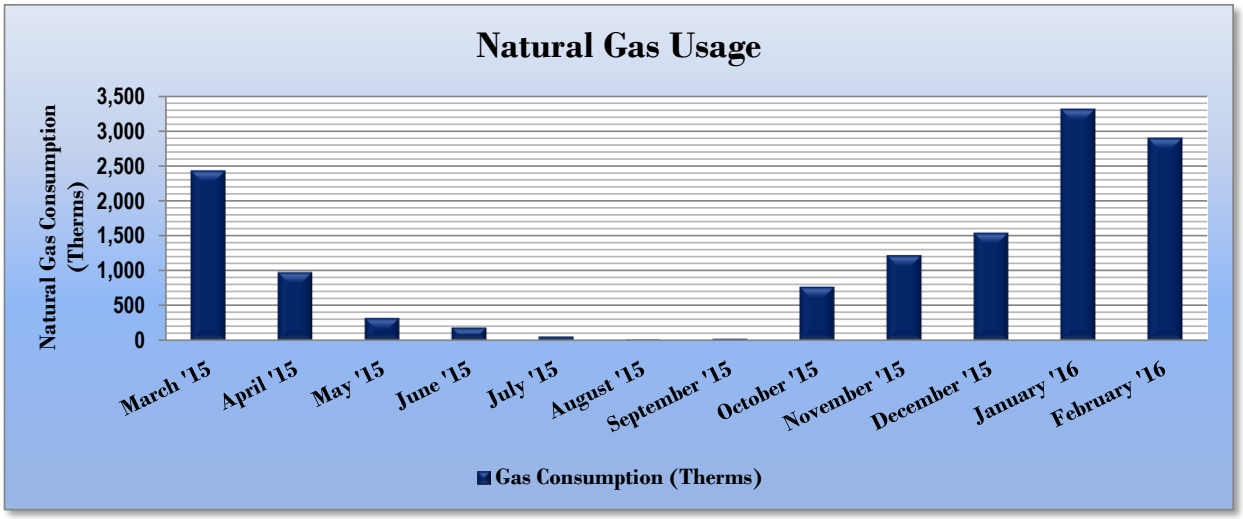


Figure 12 -Natural Gas Usage

Gas Billing Data for Brookdale Administration Center				
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost	TRC Estimated Usage?
4/1/15	31	2,431	$2,773	Yes
5/1/15	30	978	$1,287	Yes
6/1/15	31	320	$614	Yes
7/1/15	30	184	$468	Yes
8/1/15	31	56	$341	Yes
9/1/15	31	12	$298	Yes
10/1/15	30	20	$307	Yes
11/1/15	31	768	$1,040	Yes
12/1/15	30	1,218	$1,483	Yes
1/1/16	31	1,540	$1,800	Yes
2/1/16	31	3,314	$3,543	Yes
3/1/16	28	2,897	$3,134	Yes
Totals	**365**	**13,736**	**$17,087**	12
Annual	**365**	**13,736**	**$17,087**	

3.4 Benchmarking

This facility was benchmarked using Portfolio Manager, an online tool created and managed by the United States Environmental Protection Agency (EPA) through the ENERGY STAR® program. Portfolio Manager analyzes your building's consumption data, cost information, and operational use details and then compares its performance against a national median for similar buildings of its type. Metrics provided by this analysis are Energy Use Intensity (EUI) and an ENERGY STAR®sScore for select building types.

The EUI is a measure of a facility's energy consumption per square foot, and it is the standard metric for comparing buildings' energy performance. Comparing the EUI of a building with the national median EUI for that building type illustrates whether that building uses more or less energy than similar buildings of its type on a square foot basis. 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.

Figure 13 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Brookdale Administration Center	National Median Building Type: Office
Source Energy Use Intensity (kBtu/ft^2)	128.1	148.1
Site Energy Use Intensity (kBtu/ft^2)	70.2	67.3

Implementation of all recommended measures in this report would improve the building's estimated EUI significantly, as shown in the table below:

Figure 14 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Brookdale Administration Center	National Median Building Type: Office
Source Energy Use Intensity (kBtu/ft^2)	106.4	148.1
Site Energy Use Intensity (kBtu/ft^2)	63.0	67.3

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification.

This building is not eligible to receive an ENERGY STAR® score, because it shares electric and gas end usage with the other central campus buildings which are all served by the Central Utility Plant's main electric and gas accounts. Without individual submeters to measure each building's actual electric and thermal energy usage, we cannot be certain that the assumptions on which we based our estimates of building performance are accurate for this building and other central campus buildings. Because of this limitation, a Portfolio Manager Statement of Energy Performance (SEP) was generated for all of the BCC Lincroft central campus buildings combined, based on the utility data provided for the master electric and gas accounts. Please see Appendix B: ENERGY STAR® Statement of Energy Performance.

A Portfolio Manager Statement of Energy Performance (SEP) was generated for this facility, see Appendix B: ENERGY STAR® Statement of Energy Performance.

For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

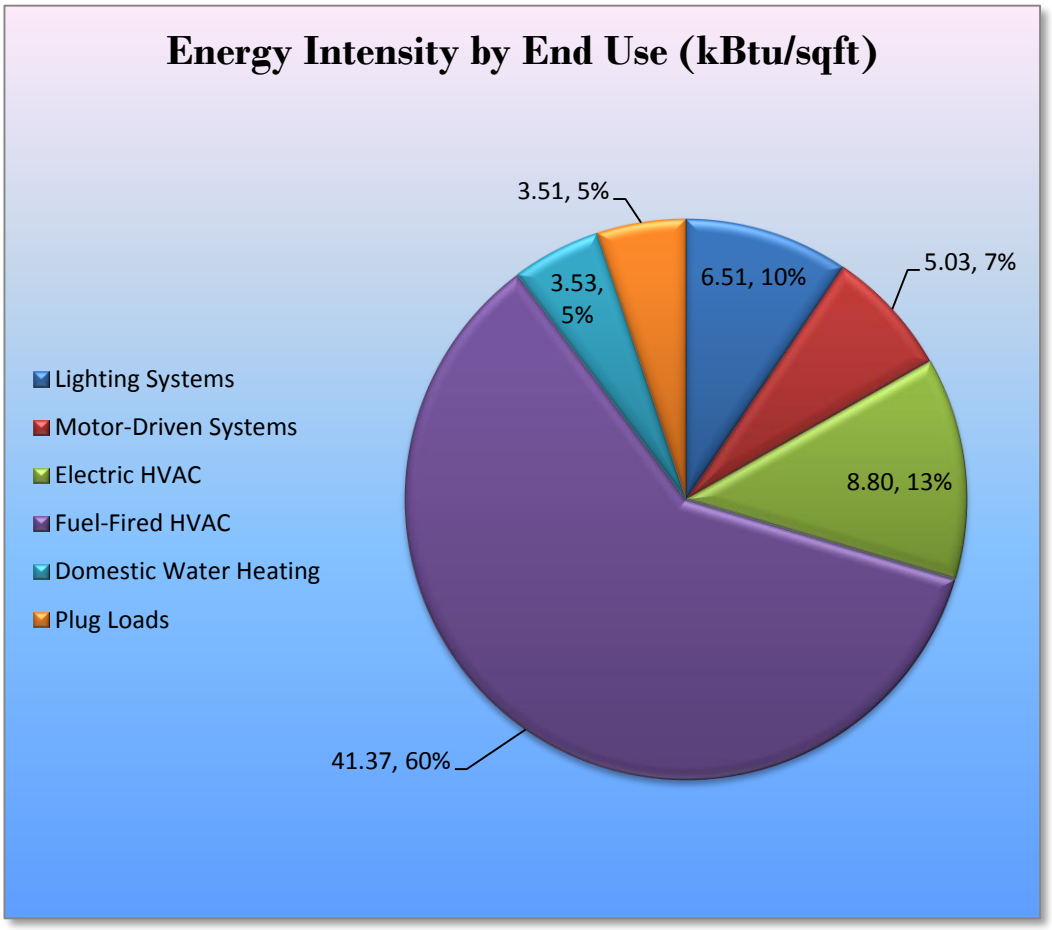
A Portfolio Manager account has been created online for your facility and you will be provided with the login information for the account. We encourage you to update your utility information in Portfolio Manager regularly, so that you can keep track of your building's performance. Free online training is available to help you use ENERGY STAR® Portfolio Manager to track your building's performance at: https://www.energystar.gov/buildings/training.

3.5 Energy End-Use Breakdown

In order to provide a complete overview of energy consumption across building systems, an energy balance was performed at this facility. An energy balance utilizes standard practice engineering methods to evaluate all components of the various electric and fuel-fired systems found in a building and determine their proportional contribution to overall building energy usage.

This chart of energy end uses highlights the relative contribution of each equipment category to total energy usage. This can help determine where the greatest benefits might be found from energy efficiency measures.

Figure 15 - Energy Balance (kBtu/SF,%)



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the Brookdale Administration Center regarding financial incentives for which they may qualify to implement the recommended measures. For this audit report, most measures have received only a preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to demonstrate project cost-effectiveness and help prioritize energy measures. Savings are based on the New Jersey Clean Energy Program Protocols to Measure Resource Savings dated June 29, 2016 approved by the New Jersey Board of Public Utilities. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances. A higher level of investigation may be necessary to support any custom SmartStart or Pay for Performance, or Direct Install incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJCEP prescriptive SmartStart program. Some measures and proposed upgrade projects may be eligible for higher incentives than those shown below through other NJCEP programs as described in Section 8.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

The measures below have been evaluated by the auditor and are recommended for implementation at the facility.

Figure 16 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**36,284**	**10.9**	**0.0**	**$4,075.59**	**$36,461.18**	**$3,970.00**	**$32,491.18**	**8.0**	**36,538**
ECM 1	Install LED Fixtures	1,435	0.4	0.0	$161.21	$2,434.32	$20.00	$2,414.32	15.0	1,445
ECM 2	Retrofit Fixtures with LED Lamps	33,690	10.4	0.0	$3,784.25	$31,553.10	$3,950.00	$27,603.10	7.3	33,926
ECM 3	Install LED Exit Signs	1,159	0.1	0.0	$130.13	$2,473.77	$0.00	$2,473.77	19.0	1,167
Lighting Control Measures		**7,616**	**2.3**	**0.0**	**$855.42**	**$8,282.00**	**$670.00**	**$7,612.00**	**8.9**	**7,669**
ECM 4	Install Occupancy Sensor Lighting Controls	5,766	1.8	0.0	$647.62	$6,882.00	$670.00	$6,212.00	9.6	5,806
ECM 5	Install High/Low Lighitng Controls	1,850	0.6	0.0	$207.80	$1,400.00	$0.00	$1,400.00	6.7	1,863
HVAC System Improvements		**15,909**	**3.6**	**0.0**	**$1,786.93**	**$2,800.00**	**$1,000.00**	**$1,800.00**	**1.0**	**16,020**
ECM 6	Install Dual Enthalpy Outside Economizer Control	15,909	3.6	0.0	$1,786.93	$2,800.00	$1,000.00	$1,800.00	1.0	16,020
Domestic Water Heating Upgrade		**0**	**0.0**	**12.7**	**$157.61**	**$93.21**	**$0.00**	**$93.21**	**0.6**	**1,483**
ECM 7	Install Low-Flow Domestic Hot Water Devices	0	0.0	12.7	$157.61	$93.21	$0.00	$93.21	0.6	1,483
Plug Load Equipment Control - Vending Machine		**1,954**	**0.0**	**0.0**	**$219.52**	**$460.00**	**$0.00**	**$460.00**	**2.1**	**1,968**
ECM 8	Vending Machine Control	1,954	0.0	0.0	$219.52	$460.00	$0.00	$460.00	2.1	1,968
TOTALS		**61,762**	**16.8**	**12.7**	**$7,095.07**	**$48,096.39**	**$5,640.00**	**$42,456.39**	**6.0**	**63,678**

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

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

4.1.1 Lighting Upgrades

Recommended upgrades to existing lighting fixtures are summarized in Figure 17 below.

Figure 17 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**36,284**	**10.9**	**0.0**	**$4,075.59**	**$36,461.18**	**$3,970.00**	**$32,491.18**	**8.0**	**36,538**
ECM 1	Install LED Fixtures	1,435	0.4	0.0	$161.21	$2,434.32	$20.00	$2,414.32	15.0	1,445
ECM 2	Retrofit Fixtures with LED Lamps	33,690	10.4	0.0	$3,784.25	$31,553.10	$3,950.00	$27,603.10	7.3	33,926
ECM 3	Install LED Exit Signs	1,159	0.1	0.0	$130.13	$2,473.77	$0.00	$2,473.77	19.0	1,167

During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled.

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	1,435	0.4	0.0	$161.21	$2,434.32	$20.00	$2,414.32	15.0	1,445
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend replacing existing fixtures containing metal halide lamps with new high-performance LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of a fluorescent tube and more than 10 times longer than many incandescent lamps.

ECM 2: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	33,690	10.4	0.0	$3,784.25	$31,553.10	$3,950.00	$27,603.10	7.3	33,926
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend retrofitting existing halogen incandescent, compact fluorescent and linear fluorescent lamps with LED lamps. Many LED tube lamps are direct replacements for existing fluorescent lamps and can be installed while leaving the fluorescent fixture ballast in place. LED bulbs can be used in existing fixtures as a direct replacement for most other lighting technologies. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of a fluorescent tube and more than 10 times longer than many incandescent lamps.

ECM 3: Install LED Exit Signs

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	1,159	0.1	0.0	$130.13	$2,473.77	$0.00	$2,473.77	19.0	1,167
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend replacing all compact fluorescent exit signs with LED exit signs. LED exit signs require virtually no maintenance and have a life expectancy of at least 20 years. This measure saves energy by installing LED fixtures, which use less power than other technologies with an equivalent lighting output.

4.1.2 Lighting Control Measures

Figure 18 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**7,616**	**2.3**	**0.0**	**$855.42**	**$8,282.00**	**$670.00**	**$7,612.00**	**8.9**	**7,669**
ECM 4	Install Occupancy Sensor Lighting Controls	5,766	1.8	0.0	$647.62	$6,882.00	$670.00	$6,212.00	9.6	5,806
ECM 5	Install High/Low Lighitng Controls	1,850	0.6	0.0	$207.80	$1,400.00	$0.00	$1,400.00	6.7	1,863

During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled.

ECM 4: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
5,766	1.8	0.0	$647.62	$6,882.00	$670.00	$6,212.00	9.6	5,806

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in all offices, conference room and restrooms. Lighting sensors detect occupancy using ultrasonic and/or infrared sensors. For most spaces, we recommend lighting controls use dual technology sensors, which can eliminate the possibility of any lights turning off unexpectedly. Lighting systems are enabled when an occupant is detected. Fixtures are automatically turned off after an area has been vacant for a preset period. Some controls also provide dimming options and all modern occupancy controls can be easily over-ridden by room occupants to allow them to manually turn fixtures on or off, as desired. Energy savings results from only operating lighting systems when they are required.

Occupancy sensors may be mounted on the wall at existing switch locations, mounted on the ceiling, or in remote locations. In general, wall switch replacement sensors are recommended for single occupant offices and other small rooms. Ceiling-mounted or remote mounted sensors are used in locations without local switching or where wall switches are not in the line-of-sight of the main work area and in large spaces. We recommend a comprehensive approach to lighting design that upgrades both the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 5: Install High/Low Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
1,850	0.6	0.0	$207.80	$1,400.00	$0.00	$1,400.00	6.7	1,863

Measure Description

We recommend installing occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons. Typical areas for such lighting control are interior corridors. Lighting fixtures with these controls operate at default low levels when the area is not occupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. The lighting systems are switched to full lighting levels whenever an occupant is detected. Fixtures are automatically switched back to low level after an area has been vacant for a preset period of time. Energy savings results from only providing full lighting levels when it is required.

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

Additional savings from reduced lighting maintenance may also result from this measure, due to reduced lamp operation.

4.1.3 HVAC System Upgrades

Our recommendation for HVAC system improvement are summarized in Figure 19 below.

Figure 19 - Summary of HVAC System Improvement ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
HVAC System Improvements		**15,909**	**3.6**	**0.0**	**$1,786.93**	**$2,800.00**	**$1,000.00**	**$1,800.00**	**1.0**	**16,020**
ECM 6	Install Dual Enthalpy Outside Economizer Control	15,909	3.6	0.0	$1,786.93	$2,800.00	$1,000.00	$1,800.00	1.0	16,020

ECM 6: Install Dual-Enthalpy Economizers

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
15,909	3.6	0.0	$1,786.93	$2,800.00	$1,000.00	$1,800.00	1.0	16,020

Measure Description

Dual enthalpy economizers are used to control a ventilation system's outside air intake in order to reduce a facility's total cooling load. A dual-enthalpy economizer monitors the air temperature and humidity of both the outside and return air. The control supplies the lowest energy (temperature and humidity) air to the air handling system. When outside air conditions allow, outside air can be used for cooling instead of running the air handling system's compressor. This reduces the demand on the cooling system, lowering its usage hours and saving energy.

Savings result from using outside air instead of mechanical cooling when outside air conditions permit.

4.1.4 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 20 below.

Figure 20 - Summary of Domestic Water Heating ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**12.7**	**$157.61**	**$93.21**	**$0.00**	**$93.21**	**0.6**	**1,483**
ECM 7	Install Low-Flow Domestic Hot Water Devices	0	0.0	12.7	$157.61	$93.21	$0.00	$93.21	0.6	1,483

ECM 7: Install Low-Flow DHW Devices

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	12.7	$157.61	$93.21	$0.00	$93.21	0.6	1,483

Measure Description

We recommend installing low-flow domestic hot water devices to reduce overall hot water demand. Energy demand from domestic hot water heating systems can be reduced by reducing water usage in general. Faucet aerators can reduce hot water usage, relative to standard aerators, which saves energy.

Low-flow devices reduce the overall water flow from the fixture, while still adequate pressure for washing. This reduces the amount of water used per day resulting in energy and water savings.

4.1.5 Plug Load Equipment Control - Vending Machines

ECM 8: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
1,954	0.0	0.0	$219.52	$460.00	$0.00	$460.00	2.1	1,968

Measure Description

Vending machines operate continuously, even during non-business hours. It is recommended to install occupancy sensor controls to reduce the energy use. These controls power down vending machines when the vending machine area has been vacant for some time, then power up at regular intervals, as needed, to turn machine lights on or keep the product cool. Energy savings are a dependent on vending machine and activity level in the area surrounding the machines.

4.2 ECMs Evaluated But Not Recommended

The measures below have been evaluated by the auditor but are not recommended for implementation at the facility. Reasons for exclusion can be found in each measure description section.

Figure 21 – Summary of Measures Evaluated, But Not Recommended

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures	**13,779**	**11.4**	**0.0**	**$1,547.70**	**$92,429.89**	**$4,218.00**	**$88,211.89**	**57.0**	**13,875**
Install High Efficiency Electric AC	13,779	11.4	0.0	$1,547.70	$92,429.89	$4,218.00	$88,211.89	57.0	13,875
Gas Heating (HVAC/Process) Replacement	**0**	**0.0**	**112.3**	**$1,396.60**	**$16,993.00**	**$1,600.00**	**$15,393.00**	**11.0**	**13,145**
Install High Efficiency Furnaces	0	0.0	112.3	$1,396.60	$16,993.00	$1,600.00	$15,393.00	11.0	13,145
TOTALS	**13,779**	**11.4**	**112.3**	**$2,944.30**	**$109,422.89**	**$5,818.00**	**$103,604.89**	**35.2**	**27,020**

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

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

Install High Efficiency Air Conditioning Units

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
13,779	11.4	0.0	$1,547.70	$92,429.89	$4,218.00	$88,211.89	57.0	13,875

Measure Description

We recommend replacing standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units. There have been significant improvements in both compressor and fan motor efficiencies over the past several years. Therefore, electricity savings can be achieved by replacing older units with new high efficiency units. A higher EER or SEER rating indicates a more efficient cooling system. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high efficiency unit, the average cooling load, and the estimated annual operating hours.

Reasons for not Recommending

The simple payback for this project is 57 years which is more than the typical useful life of 15 years for package units. Therefore, this measure is not recommended.

Install High Efficiency Furnaces

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	112.3	$1,396.60	$16,993.00	$1,600.00	$15,393.00	11.0	13,145

Measure Description

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

Reasons for not Recommending

The furnaces are integral to the package units overall. A furnace section replacement, if performed, would pair a new heating component with an aging cooling component and housing. The site could consider wholesale replacement of the package units as a capital improvement measure, but the project would not pay back cost effectively on energy savings alone.

5 ENERGY EFFICIENT PRACTICES

In addition to the quantifiable savings estimated in Section 4, a facility's energy performance can also be improved through application of many low cost or no-cost energy efficiency strategies. By employing certain behavioral and operational changes and performing routine maintenance on building systems, equipment lifetime can be extended; occupant comfort, health and safety can be improved; and energy and O&M costs can be reduced. The recommendations below are provided as a framework for developing a whole building maintenance plan that is customized to your facility. Consult with qualified equipment specialists for details on proper maintenance and system operation.

Reduce Air Leakage

Air leakage, or infiltration, occurs when outside air enters a building uncontrollably through cracks and openings. Properly sealing such cracks and openings can significantly reduce heating and cooling costs, improve building durability, and create a healthier indoor environment. This includes caulking or installing weather stripping around leaky doors and windows allowing for better control of indoor air quality through controlled ventilation.

Close Doors and Windows

Ensure doors and windows are closed in conditioned spaces. Leaving doors and windows open leads to a significant increase in heat transfer between conditioned spaces and the outside air. Reducing a facility's air changes per hour (ACH) can lead to increased occupant comfort as well as significant heating and cooling savings, especially when combined with proper HVAC controls and adequate ventilation.

Perform Proper Lighting Maintenance

In order to sustain optimal lighting levels, lighting fixtures should undergo routine maintenance. Light levels decrease over time due to lamp aging, lamp and ballast failure, and buildup of dirt and dust on lamps, fixtures and reflective surfaces. Together, these factors can reduce total illumination by 20% - 60% or more, while operating fixtures continue drawing full power. To limit this reduction, lamps, reflectors and diffusers should be thoroughly cleaned of dirt, dust, oil, and smoke film buildup approximately every 6 – 12 months.

Develop a Lighting Maintenance Schedule

In addition to routine fixture cleaning, development of a maintenance schedule can both ensure maintenance is performed regularly and can reduce the overall cost of fixture re-lamping and re-ballasting. By re-lamping and re-ballasting fixtures in groups, lighting levels are better maintained and the number of site visits by a lighting technician or contractor can be minimized, decreasing the overall cost of maintenance.

Ensure Lighting Controls Are Operating Properly

Lighting controls are very cost-effective energy efficient devices, when installed and operating correctly. As part of a lighting maintenance schedule, lighting controls should be tested annually to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight sensors, maintenance involves cleaning of sensor lenses and confirming setpoints and sensitivity are appropriately configured.

Turn Off Unneeded Motors

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. Reducing run hours for these motors can result in significant energy savings. Whenever possible, use automatic devices such as twist timers or occupancy sensors to ensure that motors are turned off when not needed.

Reduce Motor Short Cycling

Frequent stopping and starting of motors subject rotors and other parts to substantial stress. This can result in component wear, reducing efficiency, and increasing maintenance costs. Adjust the load on the motor to limit the amount of unnecessary stopping and starting to improve motor performance.

Perform Routine Motor Maintenance

Motors consist of many moving parts whose collective degradation can contribute to a significant loss of motor efficiency. In order to prevent damage to motor components, routine maintenance should be performed. This maintenance consists of 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.

Use Fans to Reduce Cooling Load

Utilizing ceiling fans to supplement cooling is a low-cost strategy to reduce cooling load considerably. Thermostat settings can be increased by 4°F with no change in overall occupant comfort when the wind chill effect of moving air is employed for cooling.

Practice Proper Use of Thermostat Schedules and Temperature Resets

Ensure thermostats are correctly set back. By employing proper set back temperatures and schedules, facility heating and cooling costs can be reduced dramatically during periods of low or no occupancy. As such, thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced further 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.

Clean Evaporator/Condenser Coils on AC Systems

Dirty evaporators and condensers coils cause a restriction to air flow and restrict heat transfer. This results in increased evaporator and condenser fan load and a decrease in cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

Clean and/or Replace HVAC Filters

Air filters work to reduce the amount of indoor air pollution and increase occupant comfort. Over time, filters become less and less effective as particulate buildup increases. In addition to health concerns related to clogged filters, filters that have reached saturation also restrict air flow through the facility's air conditioning or heat pump system, increasing the load on the distribution fans and decreasing occupant comfort levels. Filters should be checked monthly and cleaned or replaced when appropriate.

Check for and Seal Duct Leakage

Duct leakage in commercial buildings typically accounts for 5% to 25% of the supply airflow. In the case of rooftop air handlers, duct leakage can occur to the outside of the building, significantly increasing cooling and heating costs. By sealing sources of leakage, cooling, heating, and ventilation energy use can be reduced significantly, depending on the severity of air leakage.

Perform Proper Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to retain proper functionality and efficiency of the heating system. Fuel burning equipment should undergo yearly tune-ups to ensure they are operating as safely and efficiently as possible from a combustion standpoint. A tune-up should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Buildup of dirt, dust, or deposits on the internal surfaces of a boiler can greatly affect its heat transfer efficiency. These deposits can accumulate on the water side or fire side of the boiler. Boilers should be cleaned regularly according to the manufacturer's instructions to remove this build up in order to sustain efficiency and equipment life.

Perform Proper Furnace Maintenance

Preventative furnace maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should include tasks such as checking for gas / carbon monoxide leaks; changing the air and fuel filters; checking components for cracks, corrosion, dirt, or debris build-up; ensuring the ignition system is working properly; testing and adjusting operation and safety controls; inspecting the electrical connections; and ensuring proper lubrication for motors and bearings.

Perform Proper Water Heater Maintenance

At least once a year, 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. Once a year check for any leaks or heavy corrosion on the pipes and valves. For gas water heaters, check the draft hood and make sure it is placed properly, with a few inches of air space between the tank and where it connects to the vent. Look for any 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 any 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 over three (3) to four (4) years old have a technician inspect the sacrificial anode annually.

Plug Load Controls

There are a variety of ways to limit the energy use of plug loads including increasing occupant awareness, removing under-utilized equipment, installing hardware controls, and using software controls. Some control steps to take are to enable the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips. For additional information refer to "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

Water Conservation

Installing low-flow faucets or faucet aerators, low-flow showerheads, and kitchen sink pre-rinse spray valves saves both energy and water. These devices save energy by reducing the overall amount of hot water used hence reducing the energy used to heat the water. The flow ratings for EPA WaterSense™ (http://www3.epa.gov/watersense/products) labeled devices are 1.5 gallons per minute (gpm) for bathroom faucets, 2.0 gpm for showerheads, and 1.28 gpm for pre-rinse spray valves.

Installing dual flush or low-flow toilets and low-flow or waterless urinals are additional ways to reduce the sites water use, however, these devices do not provide energy savings at the site level. 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. The EPA WaterSense™ ratings for urinals is 0.5 gallons per flush (gpf) and toilets that use as little as 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

Refer to Section 4.1.4 for any low-flow ECM recommendations.

6 On-Site Generation Measures

On-site generation measure options include both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) on-site technologies that generate power to meet all or a portion of the electric energy needs of a facility, often repurposing any waste heat where applicable. Also referred to as distributed generation, these systems contribute to Greenhouse Gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, resulting in the electric system reliability through improved transmission and distribution system utilization.

The State of New Jersey's Energy Master Plan (EMP) encourages new distributed generation of all forms and specifically focuses on expanding use of combined heat and power (CHP) by reducing financial, regulatory and technical barriers and identifying opportunities for new entries. The EMP also outlines a goal of 70% of the State's electrical needs to be met by renewable sources by 2050.

Preliminary screenings were performed to determine the potential that a generation project could provide a cost-effective solution for your facility. Before making a decision to implement, a feasibility study should be conducted that would take a detailed look at 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.

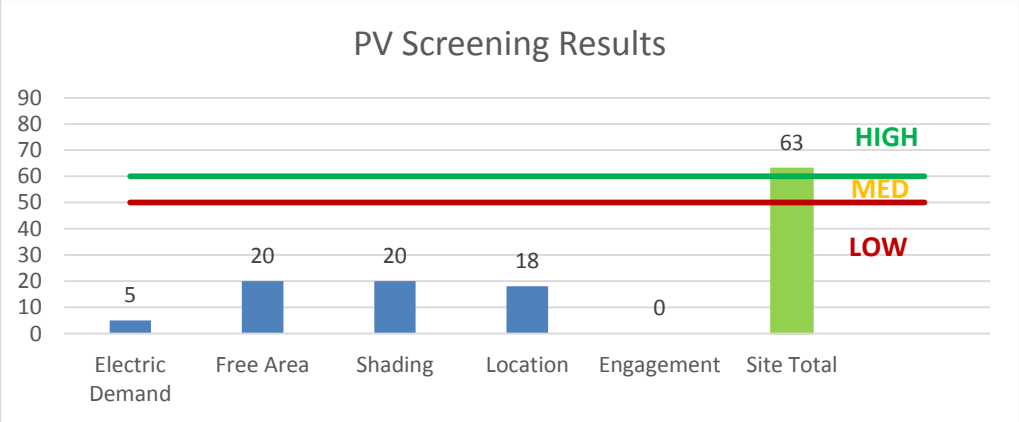
6.1 Photovoltaic

Sunlight can be converted into electricity using photovoltaics (PV) modules. Modules are racked together into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is interconnected to the facility's electrical distribution system. The amount of unobstructed area available determines how large of a solar array can be installed. The size of the array combined with the orientation, tilt, and shading elements determines the energy produced.

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

In order to be cost-effective, a solar PV array needs certain minimum criteria, such as flat or south-facing rooftop or other unshaded space on which to place the PV panels. In our opinion, the facility does not appear meet these minimum criteria for cost-effective PV installation.

Figure 22 - Photovoltaic Screening



Potential	High	
System Potential	120	kW DC STC
Electric Generation	142,965	kWh/yr
Displaced Cost	$12,440	/yr
Installed Cost	$312,000	

Solar projects must register their projects in the SREC Registration Program prior to the start of construction in order to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about developed new solar projects and insight into future SREC pricing. Refer to Section 8.2 for additional information.

For more information on solar PV technology and commercial solar markets in New Jersey, or to find a qualified solar installer, who can provide a more detailed assessment of the specific costs and benefits of solar develop of the site, please visit the following links below:

- **Basic Info on Solar PV in NJ**: http://www.njcleanenergy.com/whysolar
- **NJ Solar Market FAQs**: http://www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the NJ Market**: http://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) is the on-site generation of electricity along with the recovery of heat energy, which is put to beneficial use. Common technologies for CHP include reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines. Electric generation from a CHP system is typically interconnected to local power distribution systems. Heat is recovered from exhaust and ancillary cooling systems and interconnected to the existing hot water (or steam) distribution systems.

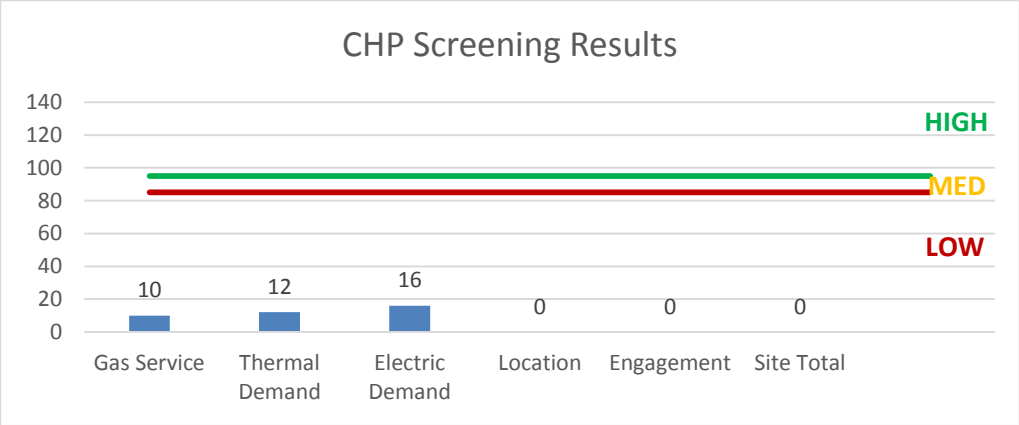
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for the purpose of space cooling. The key criteria used for screening, however, is the amount of time the system operates at full load and the facility's ability to use the recovered heat. Facilities with continuous use for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection indicates a Low potential for combined heat and power.

Low or infrequent thermal load, and lack of space near the existing boilers are the most significant factors contributing to the low potential for CHP at the site. In our opinion, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation.

For a list of qualified firms in New Jersey specializing in commercial CHP cost assessment and installation, go to: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.

Figure 23 - Combined Heat and Power Screening



7 DEMAND RESPONSE

Demand Response (DR) is a program designed to reduce the electric load of commercial facilities when electric wholesale prices are high or when the reliability of the electric grid is threatened due to peak demand. Demand Response service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability.

By enabling grid operators to call upon Curtailment Service Providers and commercial facilities to reduce electric usage 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 DR programs. Program participation is voluntary and participants receive payments whether or not their facility is called upon to curtail their electric usage.

Typically an electric customer needs to be capable of reducing their electric demand, within minutes, by at least 100 kW or more in order to participate in a DR program. Customers with a greater capability to quickly curtail their demand during peak hours will receive higher payments. Customers with back-up generators onsite may also receive additional DR payments for their generating capacity if they agree to run the generators for grid support when called upon. Eligible customers who have chosen to participate in a DR programs often find it to be a valuable source of revenue for their facility because the payments can significantly offset annual electric costs.

Participating customers can often quickly reduce their peak load through simple measures, such as temporarily raising temperature set points on thermostats, so that air conditioning units run less frequently, or agreeing to dim or shut off less critical lighting. This usually requires some level of building automation and controls capability to ensure rapid load reduction during a DR curtailment event. DR program participants may need to install smart meters or may need to also sub-meter larger energy-using equipment, such as chillers, in order to demonstrate compliance with DR program requirements.

DR does not include the reduction of electricity consumption based on normal operating practice or behavior. For example, if a company's normal schedule is to close for a holiday, the reduction of electricity due to this closure or scaled-back operation is not considered a demand response activity in most situations.

The first step toward participation in a DR program is to contact a Curtailment Service Provider. A list of these providers is available on PJM's website and it includes contact information for each company, as well as the states where they have active business (http://www.pjm.com/markets-and-operations/demand-response/csps.aspx). PJM also posts training materials that are developed for program members interested in specific rules and requirements regarding DR activity (http://www.pjm.com/training/training%20material.aspx), along with a variety of other DR program information.

Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding program rules and requirements for metering and controls, assess a facility's ability to temporarily reduce electric load, and provide details on payments to be expected for participation in the program. Providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment of their own to help ensure compliance with all terms and conditions of a DR contract.

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 24 for a list of the eligible programs identified for each recommended ECM.

Figure 24 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	X					
ECM 2	Retrofit Fixtures with LED Lamps	X					
ECM 3	Install LED Exit Signs						
ECM 4	Install Occupancy Sensor Lighting Controls	X					
ECM 5	Install High/Low Lighitng Controls						
ECM 6	Install Dual Enthalpy Outside Economizer Control	X					
ECM 7	Install Low-Flow Domestic Hot Water Devices						
ECM 8	Vending Machine Control						

SmartStart is generally well-suited for implementation of individual measures or small group of measures. It provides flexibility to install measures at your own pace using in-house staff or a preferred contractor. Direct Install caters to small to mid-size facilities that can bundle multiple ECMs together. This can greatly simplify participation and may lead to higher incentive amounts, but requires the use of pre-approved contractors. The Pay for Performance (P4P) program is a "whole-building" energy improvement program designed for larger facilities. It requires implementation of multiple measures meeting minimum savings thresholds, as well as use of pre-approved consultants. The Large Energy Users Program (LEUP) is available to New Jersey's largest energy users giving them flexibility to install as little or as many measures, in a single facility or several facilities, with incentives capped based on the entity's annual energy consumption. LEUP applicants can use in-house staff or a preferred contractor.

Generally, the incentive values provided throughout the report assume the SmartStart program is utilized because it provides a consistent basis for comparison of available incentives for various measures, though in many cases incentive amounts may be higher through participation in other programs.

Brief descriptions of all relevant financing and incentive programs are located in the sections below. Further information, including most current program availability, requirements, and incentive levels can be found at: www.njcleanenergy.com/ci.

8.1 SmartStart

Overview

The SmartStart program offers incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program adds, removes or modifies incentives from year to year for various energy efficiency equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

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

Most equipment sizes and types are served by this program. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades.

Incentives

The SmartStart prescriptive incentive program provides fixed incentives for specific energy efficiency measures, whereas the custom SmartStart program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentive offerings for specific devices.

Since your facility is an existing building, only the retrofit incentives have been applied in this report. Custom Measure incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings, capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

To participate in the SmartStart program you will need to submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. Applicants may work with a contractor of their choosing and can also utilize internal personnel, which provides added flexibility to the program. Using internal personnel also helps improve the economics of the ECM by reducing the labor cost that is included in the tables in this report.

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

8.2 SREC Registration Program

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

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

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

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar RPS. One way they can meet the RPS requirements is by purchasing SRECs. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period can and will fluctuate depending on supply and demand.

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

8.3 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) is an alternate method for New Jersey's government agencies to finance the implementation of energy conservation measures. An ESIP is a type of "performance contract,"whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. This is done in a manner that ensures that annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive in year one, and every year thereafter. 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 can be leveraged to help further reduce the total project cost of eligible measures.

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 utilized for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

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

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

Please note that ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you may utilize NJCEP incentive programs to help further reduce costs when developing the ESP. You should refer to the ESIP guidelines at the link above for further information and guidance on next steps.

8.4 Demand Response Energy Aggregator

The first step toward participation in a Demand Response (DR) program is to contact a Curtailment Service Provider. A list of these providers is available on PJM's website and it includes contact information for each company, as well as the states where they have active business (http://www.pjm.com/markets-and-operations/demand-response/csps.aspx). PJM also posts training materials that are developed for program members interested in specific rules and requirements regarding DR activity (http://www.pjm.com/training/training%20material.aspx), along with a variety of other program information.

Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding the program rules and requirements for metering and controls, a facility's ability to temporarily reduce electric load, as well as the payments involved in participating in the program. Also, these providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment to help ensure compliance of all terms and conditions of a DR contract.

See Section 7 for additional information.

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

In 1999, New Jersey State Legislature passed the Electric Discount & Energy Competition Act (EDECA) to restructure the electric power industry in New Jersey. This law deregulated the retail electric markets, allowing all consumers to shop for service from competitive electric suppliers. The intent was to create a more competitive market for electric power supply in New Jersey. As a result, utilities were allowed to charge Cost of Service and customers were given the ability to choose a third party (i.e. non-utility) energy supplier.

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

If your facility is not purchasing electricity from a third party supplier, consider shopping for a reduced rate from third party electric suppliers. If your facility is purchasing electricity from a third party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third party electric suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

9.2 Retail Natural Gas Supply Options

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

A customer's decision about whether to buy natural gas from a retail supplier is typically dependent upon whether a customer seeks 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 is not purchasing natural gas from a third party supplier, consider shopping for a reduced rate from third party natural gas suppliers. If your facility is purchasing natural gas from a third party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third party natural gas suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: 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	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
1st Floor Main Area	38	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	Yes	38	LED - Fixtures: Downlight Solid State Retrofit	High/Low Control	15	1,456	0.43	1,409	0.0	$158.25	$2,818.70	$0.00	17.81
1st Floor Main Area	4	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	201	0.0	$22.63	$430.22	$0.00	19.01
Hallway	9	Compact Fluorescent: recessed 26W 4-pin	Wall Switch	26	2,080	Relamp	Yes	9	LED - Fixtures: Downlight Solid State Retrofit	High/Low Control	15	1,456	0.10	334	0.0	$37.48	$772.85	$0.00	20.62
Men Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.04	115	0.0	$12.90	$144.60	$30.00	8.89
Men Restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.15	499	0.0	$56.02	$408.50	$85.00	5.77
Women Restroom	5	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	Yes	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,456	0.08	252	0.0	$28.35	$357.00	$50.00	10.83
Women Restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.15	499	0.0	$56.02	$562.50	$85.00	8.52
Back Entrance	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.05	153	0.0	$17.20	$192.80	$40.00	8.89
Back Entrance	1	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.00	50	0.0	$5.66	$107.56	$0.00	19.01
Room 114 (Utility Room)	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.05	158	0.0	$17.73	$117.00	$20.00	5.47
Room 112 (Utility Room)	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.05	158	0.0	$17.73	$117.00	$20.00	5.47
Room 101	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.40	1,297	0.0	$145.65	$876.50	$150.00	4.99
Room 111	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,080	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,456	0.09	299	0.0	$33.61	$266.40	$50.00	6.44
Room 100A	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,080	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,456	0.14	449	0.0	$50.42	$341.60	$65.00	5.49
Room 100 Hallway	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,456	0.49	1,596	0.0	$179.26	$1,136.00	$160.00	5.44
Room 100 Hallway	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.01	38	0.0	$4.30	$48.20	$10.00	8.89
Room 100A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.09	299	0.0	$33.61	$291.50	$50.00	7.18
Room 100E	8	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	Yes	8	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,456	0.12	404	0.0	$45.35	$501.60	$100.00	8.85
Room 100B	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 100D	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.09	299	0.0	$33.61	$291.50	$50.00	7.18
Room 100C	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Foundation Office	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.34	1,097	0.0	$123.24	$759.50	$130.00	5.11
Stairway	5	Compact Fluorescent: Recessed 13W 2-pin	Wall Switch	13	2,080	Relamp	No	5	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	9	2,080	0.01	48	0.0	$5.37	$318.25	$0.00	59.22
2nd Floor Main Area	31	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	31	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,456	0.95	3,092	0.0	$347.33	$2,013.50	$310.00	4.90
2nd Floor Main Area	2	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$11.32	$215.11	$0.00	19.01

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 217	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 218	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 219	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 220	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 221	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 222	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 223	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.09	299	0.0	$33.61	$291.50	$50.00	7.18
Room 224	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.12	399	0.0	$44.82	$350.00	$60.00	6.47
Room 225	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.02	79	0.0	$8.87	$58.50	$10.00	5.47
Room 216	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 212	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.21	698	0.0	$78.43	$525.50	$90.00	5.55
Storage Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,080	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,456	0.06	209	0.0	$23.48	$259.60	$20.00	10.20
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.02	79	0.0	$8.87	$58.50	$10.00	5.47
Men Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.02	79	0.0	$8.87	$58.50	$10.00	5.47
Women Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.02	79	0.0	$8.87	$58.50	$10.00	5.47
Office - President Hallway	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.55	1,795	0.0	$201.67	$1,169.00	$200.00	4.80
Room 206	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 202	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.09	299	0.0	$33.61	$291.50	$50.00	7.18
Romm 200 Office - President	12	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	Yes	12	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	15	1,456	0.14	445	0.0	$49.97	$879.80	$20.00	17.20
Room 201 Conference Room	20	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	Yes	20	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	15	1,456	0.23	742	0.0	$83.29	$1,389.00	$20.00	16.44
Room 201 Conference Room	2	Halogen Incandescent: PAR38 70W	Wall Switch	70	2,080	Relamp	No	2	LED Screw-In Lamps: LED screw in	Wall Switch	9	2,080	0.09	292	0.0	$32.78	$107.51	$10.00	2.97
Stairway	4	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	4	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.03	105	0.0	$11.82	$254.60	$0.00	21.54
Main Area	4	Metal Halide: (1) 150W Lamp	Wall Switch	190	2,080	Fixture Replacement	No	4	LED - Fixtures: Downlight Pendant	Wall Switch	40	2,080	0.44	1,435	0.0	$161.21	$2,434.32	$20.00	14.98
2nd Floor Walkway	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.10	316	0.0	$35.47	$234.00	$40.00	5.47
2nd Floor ASC Building Stairway	4	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	4	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.03	105	0.0	$11.82	$254.60	$0.00	21.54

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
2nd Floor ASC Building Hallway	5	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	5	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.06	191	0.0	$21.49	$241.00	$50.00	8.89
2nd Floor ASC Building Hallway	2	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$11.32	$215.11	$0.00	19.01
Room 227	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 229	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 231	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Main Area	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.58	1,895	0.0	$212.88	$1,227.50	$210.00	4.78
Men Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Women Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	Yes	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,456	0.05	151	0.0	$17.01	$260.60	$30.00	13.56
Women Restroom	1	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	1	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.01	26	0.0	$2.96	$63.65	$0.00	21.54
Closet	1	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	1	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.01	26	0.0	$2.96	$63.65	$0.00	21.54
Room 225	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Stairway	6	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	6	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.05	158	0.0	$17.73	$381.90	$0.00	21.54
Copy Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.02	79	0.0	$8.87	$58.50	$10.00	5.47
Room 226	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.28	898	0.0	$100.84	$642.50	$110.00	5.28
Room 226	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.04	115	0.0	$12.90	$144.60	$30.00	8.89
Room 228	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 230	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.12	399	0.0	$44.82	$350.00	$60.00	6.47
Adm & Oper Div Office Main Area	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.74	2,394	0.0	$268.90	$1,520.00	$260.00	4.69
Adm & Oper Div Office Main Area	4	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	4	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.03	105	0.0	$11.82	$254.60	$0.00	21.54
Room 234	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 239	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.12	399	0.0	$44.82	$350.00	$60.00	6.47
Room 236 Conference Room	6	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	Yes	6	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	15	1,456	0.07	222	0.0	$24.99	$497.90	$0.00	19.93
Room 237	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.02	77	0.0	$8.60	$96.40	$20.00	8.89
Room 238	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Men Restroom	2	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	2	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.02	53	0.0	$5.91	$127.30	$0.00	21.54

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Women Restroom	1	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	1	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.01	26	0.0	$2.96	$63.65	$0.00	21.54
1st Floor Hallway	5	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	Yes	5	LED - Fixtures: Downlight Solid State Retrofit	High/Low Control	15	1,456	0.06	185	0.0	$20.82	$518.25	$0.00	24.89
1st Floor Hallway	2	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$11.32	$215.11	$0.00	19.01
Back Entrance	2	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	2	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.02	53	0.0	$5.91	$127.30	$0.00	21.54
Back Entrance	2	Halogen Incandescent: PAR38 70W	Wall Switch	70	2,080	Relamp	No	2	LED Screw-In Lamps: LED screw in	Wall Switch	9	2,080	0.09	292	0.0	$32.78	$107.51	$10.00	2.97
Back Entrance	2	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$11.32	$215.11	$0.00	19.01
Room 140 Conference Room	9	Halogen Incandescent: PAR38 70W	Wall Switch	70	2,080	Relamp	Yes	9	LED Screw-In Lamps: LED screw in	Occupancy Sensor	9	1,456	0.42	1,371	0.0	$154.04	$599.78	$65.00	3.47
Men Restroom	1	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	1	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.01	26	0.0	$2.96	$63.65	$0.00	21.54
Men Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.04	115	0.0	$12.90	$144.60	$30.00	8.89
Women Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.02	77	0.0	$8.60	$96.40	$20.00	8.89
Women Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.02	79	0.0	$8.87	$58.50	$10.00	5.47
Women Restroom	1	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	1	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.01	26	0.0	$2.96	$63.65	$0.00	21.54
Room 132	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.12	399	0.0	$44.82	$350.00	$60.00	6.47
Room 136	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.02	79	0.0	$8.87	$58.50	$10.00	5.47
Room 135	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 134	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.02	79	0.0	$8.87	$58.50	$10.00	5.47
Room 137	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.12	399	0.0	$44.82	$350.00	$60.00	6.47
Room 133	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Employment Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Hallway	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.05	153	0.0	$17.20	$192.80	$40.00	8.89
Testing Room	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.01	38	0.0	$4.30	$48.20	$10.00	8.89
Copy Room	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.01	38	0.0	$4.30	$48.20	$10.00	8.89
Copy Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.18	598	0.0	$67.22	$467.00	$80.00	5.76
Main Area	2	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$11.32	$215.11	$0.00	19.01
Main Area	6	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	Yes	6	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	15	1,456	0.07	222	0.0	$24.99	$497.90	$20.00	19.13

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Main Area	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.04	115	0.0	$12.90	$144.60	$30.00	8.89
Main Area	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.25	798	0.0	$89.63	$584.00	$100.00	5.40
Room 123 Payroll Office	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.25	798	0.0	$89.63	$584.00	$100.00	5.40
Room 123 Payroll Office	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.01	38	0.0	$4.30	$48.20	$10.00	8.89
Finance Area Hallway	2	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$11.32	$215.11	$0.00	19.01
Finance Area Hallway	7	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	Yes	7	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,456	0.11	353	0.0	$39.68	$453.40	$90.00	9.16
Copy Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.02	79	0.0	$8.87	$58.50	$10.00	5.47
Closet	1	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	1	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.01	26	0.0	$2.96	$63.65	$0.00	21.54
Room 127	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.06	199	0.0	$22.41	$233.00	$20.00	9.51
Room 128 Account Payable	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.34	1,097	0.0	$123.24	$759.50	$130.00	5.11
Room 128 Account Payable	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.02	77	0.0	$8.60	$96.40	$20.00	8.89
Exit Area	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.01	38	0.0	$4.30	$48.20	$10.00	8.89
Exit Area	1	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.00	50	0.0	$5.66	$107.56	$0.00	19.01
Stairway 2	8	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	8	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.06	210	0.0	$23.64	$509.20	$0.00	21.54
Stairway 2	1	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.00	50	0.0	$5.66	$107.56	$0.00	19.01
Basement Hallway	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,456	0.46	1,496	0.0	$168.06	$1,077.50	$150.00	5.52
Basement Hallway	4	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	201	0.0	$22.63	$430.22	$0.00	19.01
Elevator Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.02	79	0.0	$8.87	$58.50	$10.00	5.47
Server Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.15	499	0.0	$56.02	$408.50	$70.00	6.04
Mechanical Room	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.17	553	0.0	$62.07	$409.50	$70.00	5.47
Room 003 Lunch Room	6	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,080	Relamp	Yes	6	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,456	0.09	303	0.0	$34.02	$405.20	$80.00	9.56
Ground Floor Vestibule	2	Halogen Incandescent: PAR38 70W	Wall Switch	70	2,080	Relamp	No	2	LED Screw-In Lamps: LED screw in	Wall Switch	9	2,080	0.09	292	0.0	$32.78	$107.51	$10.00	2.97
Room 2012 Closet	1	Compact Fluorescent: Recessed 2x13W 2-pin	Wall Switch	26	2,080	Relamp	No	1	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	15	2,080	0.01	26	0.0	$2.96	$63.65	$0.00	21.54
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.02	79	0.0	$8.87	$58.50	$10.00	5.47

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?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Room	Mechanical Room	2	Other	0.3	78.0%	No	780	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	Mechanical Room	1	Other	0.2	74.0%	No	650	No	74.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	Mechanical Room	3	Heating Hot Water Pump	0.3	74.0%	No	1,040	No	74.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Elevator Room	Elevator Room	1	Other	25.0	91.0%	No	780	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	Air handler	1	Supply Fan	7.5	92.0%	Yes	2,000	No	92.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	Air handler	1	Return Fan	3.0	88.0%	Yes	1,638	No	88.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	Unit 50RVR036	1	Other	0.8	81.7%	No	2,000	No	81.7%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor - Front 1st Buildin	1st & 2nd Building	2	Supply Fan	10.0	81.5%	No	2,000	No	81.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor - Front 1st Buildin	1st & 2nd Building	4	Other	1.0	75.7%	No	2,000	No	75.7%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor	Building	3	Supply Fan	0.3	71.0%	No	2,000	No	71.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Server Room	Server Room	1	Split-System AC	1.50		Yes	1	Split-System AC	1.50		14.00		No	0.49	737	0.0	$82.76	$2,244.33	$138.00	25.45
Mechanical Room	Server Room	1	Water Source HP	3.00	36.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor - Rear 2nd Buildin	2nd Building	1	Split-System AC	23.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor - Front 1st Buildin	1st & 2nd Building	2	Packaged AC	20.00		Yes	2	Packaged AC	20.00		10.50		Yes	10.05	21,245	0.0	$2,386.35	$69,295.96	$3,660.00	27.50
Ground Floor - Front 2nd Buildin	2nd Building	1	Packaged AC	5.00		Yes	1	Packaged AC	5.00		14.00		Yes	2.23	3,853	0.0	$432.76	$11,844.80	$710.00	25.73
Ground Floor - Front 1st Buildin	1st Building	1	Packaged AC	5.00		Yes	1	Packaged AC	5.00		14.00		Yes	2.23	3,853	0.0	$432.76	$11,844.80	$710.00	25.73

Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Room	Air Handler & Vestibule Area	1	Non-Condensing Hot Water Boiler	292.95	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor - Front 1st Buildin	1st & 2nd Building	2	Furnace	283.00	Yes	2	Furnace	283.00	95.00%	AFUE	0.00	0	83.0	$1,032.48	$12,824.05	$800.00	11.65
Ground Floor - Front 2nd Buildin	2nd Building	2	Furnace	92.00	Yes	2	Furnace	92.00	95.00%	AFUE	0.00	0	29.3	$364.12	$4,168.95	$800.00	9.25

DHW Inventory & Recommendations

		Existing Conditions		Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 114 Utility Room	1st Building	1	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	2nd Building	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Low-Flow Device Recommendations

	Recommedation Inputs				Energy Impact & Financial Analysis						
Location	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
BAC Building	13	Faucet Aerator (Lavatory)	1.80	1.00	0.00	0	12.7	$157.61	$93.21	$0.00	0.59

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Facility	65	Desktop Computer	191.0	Yes
Facility	5	Refrigerator	150.0	Yes
Facility	12	Microwave	800.0	No
Facility	3	Coffee Machine	900.0	No
Facility	12	Printer	160.0	Yes
Facility	8	Copy Machine	750.0	Yes
Facility	3	Toaster	950.0	No

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
1st Floor Main Area	1	Refrigerated	Yes	0.00	1,612	0.0	$181.05	$230.00	$0.00	1.27
1st Floor Main Area	1	Non-Refrigerated	Yes	0.00	343	0.0	$38.47	$230.00	$0.00	5.98

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

N/A

ENERGY STAR® Score[1]

Brookdale Community College - Lincroft Campus

Primary Property Type: College/University
Gross Floor Area (ft²): 900,381
Built: 1967

For Year Ending: February 29, 2016
Date Generated: June 28, 2017

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
Brookdale Community College - Lincroft Campus 765 Newman Springs Road Lincroft, New Jersey 07738	Brookdale Community College 765 Newman Springs Road Lincroft, NJ 07738 (732) 224-2217	Timothy Drury 765 Newman Springs Road Lincroft, NJ 07738 (732) 224-2217 tdrury@brookdalecc.edu

Property ID: 5733170

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
95.4 kBtu/ft²

Source EUI
211.9 kBtu/ft²

Annual Energy by Fuel		
Electric - Grid (kBtu)	48,132,581 (56%)	
Natural Gas (kBtu)	37,799,044 (44%)	

National Median Comparison	
National Median Site EUI (kBtu/ft²)	118.2
National Median Source EUI (kBtu/ft²)	262.6
% Diff from National Median Source EUI	-19%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	7,528

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

___ _____
,
(___)___-_____
_____

Professional Engineer Stamp
(if applicable)