CAMDEN COUNTY COLLEGE
CHILD CARE BUILDING
ENERGY ASSESSMENT

for

NEW JERSEY
BOARD OF PUBLIC UTILITIES

CHA PROJECT NO. 24364

November 2012

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APPENDICES

REPORT DISCLAIMER

This audit was conducted in accordance with the standards developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) for a Level II audit. Cost and savings calculations for a given measure were estimated to within ±20%, and are based on data obtained from the owner, data obtained during site observations, professional experience, historical data, and standard engineering practice. Cost data does not include soft costs such as engineering fees, legal fees, project management fees, financing, etc.

A thorough walkthrough of the facility was performed, which included gathering nameplate information and operating parameters for all accessible equipment and lighting systems. Unless otherwise stated, model, efficiency, and capacity information included in this report were collected directly from equipment nameplates and /or from documentation provided by the owner during the site visit. Typical operation and scheduling information was obtained from interviewing facility staff and spot measurements taken in the field.

1.0 EXECUTIVE SUMMARY

The Camden County College recently engaged CHA to perform an energy audit in connection with the New Jersey Board of Public Utilities' Local Government Energy Audit Program. This report details the results of the energy audit conducted for:

Building Name	Address	Square Feet	Construction Date
Camden County College Child Care Building	200 College Drive Building 24 Blackwood, New Jersey	4,650	Original: 1969

The Energy Conservation Measures (ECMs) identified in this report will allow for a more efficient use of energy and if pursued have the opportunity to qualify for the New Jersey SmartStart Buildings Program and/or Direct Install Program. Potential annual savings of $2,100 for the recommended ECMs may be realized with a payback of 4.8 years. A summary of the costs, savings, and paybacks for the recommended ECMs follows:

Summary of Energy Conservation Measures							
Energy Conservation Measure		Approx. Costs ($)	Approx. Savings ($/year)	Payback (Years) w/o Incentive	Potential Incentive ($)*	Payback (Years) w/ Incentive	Recommended For Implementation
ECM-1	Replace Domestic Water Heater (DWH)	4,900	400	12.3	50	12.1	X
2	Lighting Replacement Upgrades	3,600	1,000	3.6	775	2.8	X
3	Install Lighting Controls (Occupancy Sensors)	1,600	900	1.8	245	1.5	X
4	Lighting Replacements with Lighting Controls (Occupancy Sensors)	5,100	1,700	3.0	1,020	2.4	X

2.0 INTRODUCTION AND BACKGROUND

New Jersey's Clean Energy Program, funded by the New Jersey Board of Public Utilities, supports energy efficiency and sustainability for Municipal and Local Government Energy Audits. Through the support of a utility trust fund, New Jersey is able to assist state and local authorities in reducing energy consumption while increasing comfort.

The Child Care Center located on the Camden County College campus in Blackwood, NJ, is a 4,650 square foot single story building having a wood frame construction. The building is used as a daycare and contains classrooms, reception/office area, a kitchen and restrooms. The building was constructed in 1969. Occupancy includes approximately XXX children and XX faculty members. The building operates Monday through Friday from 8:00 am to approximately 6:00 pm. The building was operated by tenant until recently. The College is currently looking for a replacement organization to reassume operation.

3.0 EXISTING CONDITIONS

3.1 Building - General

Originally built in 1969, the Child Care Center is a 4,650 square foot, one-story residential -like building with having four classrooms, reception/office area, a small kitchen (with commercial refrigerator), restrooms, storage and misc. storage areas. The main entrance is a store front glass door with metal frame that opens into the front reception area on the south side of the building.

The Child Care Center building has approximately XXX children and XX faculty and staff; the building was empty during our field inspection, but is typically used year-round. The building can be assumed to be fully occupied until 6:00 pm during the week. The hours of operation are:

- Monday thru Friday 8:00 am to 6:00 pm.

The building is constructed of a mix of wood and masonry materials; finished exteriors are either painted wood or a brick veneer. Insulation is incorporated into the wall assemblies for an improved envelope. The majority of the interior walls are metal studs filled with fiberglass insulation finished with gypsum board are used. The flat roof system is comprised of steel framing with a metal deck having rigid foam board insulation with a dark colored EPDM membrane. Windows are significant on the front face of the building (~40%), and minimal on the sides and rear of the building (<20% on walls where used). There is an overhang on the building front (south façade), and on the east and west classroom wall windows. Windows are double pane set in metal frames with tinting. The main entrance doors are part glass, and part metal panel with metal frames. The building has exposed walls facing the north, east, south and west directions of varying heights (refer to photo above). The majority of the one story building is 15' in height, with a higher A-frame roof in the center above the reception/office/etc. core area. The first floor areas have concrete slab-on-grade floors.

3.2 Utility Usage

Utilities include electricity and natural gas. Electricity is delivered and supplied by Atlantic City Electric. Natural gas is delivered and supplied by South Jersey Gas. See Appendix A for a detailed utility analysis.

The building has one electric meter. From June 2011 through April 2012, the electric usage for the building was 14,235 kWh at a cost of $1,806. Review of electricity bills during this period showed that the electricity was charged at the following rates: supply unit consumption cost of $0.121 per kWh; demand unit cost of $8.60 per kW; and blended unit cost of $0.127 per kWh. It was estimated that the peak demand per month is approximately 1.0 kW from June 2011 through April 2012.

The facility has one natural gas meter. From July 2011 through May 2012, gas-fired equipment consumed 1,442 therms of natural gas. Based on the annual cost of $902, the price for natural gas was $0.80 per therm.

The delivery component of the electric and natural gas bills will always be the responsibility of the utility that connects the facility to the power grid or gas line; however, the supply can be purchased from a third party; as is currently the case with electricity and natural gas. The electricity or natural gas commodity supply entity will require submission of one to three years of past energy bills. Contract terms can vary among suppliers. According to the U.S. Energy Information Administration, the average commercial unit costs of electricity and natural gas in New Jersey during the same periods as those noted above was

$0.141 per kWh and $0.959 per therm. The electrical supply rate charged by Hess for the 12 month period from June 2011 through April 2012 resulted in lower cost to the college than having ACE both supply (see table below). When compared to the average state values, it is recommended that the present natural gas be maintained and the present electricity supply rate charge be monitored and checked monthly.

Main Electric Meter Supply Costs – Atlantic City Electric vs. Hess

Month	ACE Supply Costs (For Comparison)	Hess Supply Costs (Actual)
June-11	$111	$114.53
July-11	$68	$72.07
August-11	$109	$111.40
September-11	$139	$141.20
October-11	$163	$148.40
November-11	$167	$153.85
December-11	$212	$191.98
January-12	$175 (Not included)	N/A
February-12	$170 (Not included)	N/A
March-12	$164 (Not included)	N/A
April-12	$131 (Not included)	N/A
Total	**$970.56**	**$933.43**
Extra Savings of using Hess for Electric Supply	$37.13	

A list of approved electrical and natural gas energy commodity suppliers can be found in Appendix A.

3.3 HVAC Systems

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

3.3.1 Package DX Cooling and Heating Rooftop Units

Two 2011 vintage packaged DX cooling, natural gas heating RTUs are located on the rooftop above the areas/spaces they serve. Each RTU is mounted on an extended curb, with outside air intake and relief air dampers, with an air mixing box. Supply and return ductwork is routed down through the roof curbs to duct distribution systems above the ceilings to each space. One RTU serves the west half of the building, and the second RTU serves the east half of the building.

3.3.2 Exhaust Systems

Exhaust fans are provided for the toilet rooms and the kitchen hood. These fans are manually controlled by the staff.

3.4 Control Systems

Each of the two rooftop HVAC units are controlled by a standalone 24 volt programmable thermostat. The complexity level of the current controls appears suitable and proper for the existing building HVAC equipment.

3.5 Lighting/Electrical Systems

The facility primarily utilizes several fixtures with T-12 40 watt bulbs with magnetic ballasts. The facility also uses several 60 watt incandescent light fixtures. The building entranceway is equipped with several 42 watt compact fluorescent lamps. The primary source of control for the lights is switches manually turned off at the end of the day.

Exterior lights consist of wall pack 200 watt metal halide fixtures. There are also several 42 watt compact fluorescent lights on the exterior of the building. The wall pack lights are powered by the building's electrical system and are part of the lighting systems analysis.

3.6 Plumbing Systems

3.6.1 Domestic Hot Water System

A storage closet contains one 40 gallon electric tank type hot water heater; this serves entire Criminal Justice building. Hot water is provided toilets, a kitchen, etc., and the majority of hot water piping appears to be insulated. Hot water demand is very low due to the size an function of the building. Domestic hot water temperature is maintained at 140°F, and chemical disinfection soap is provided at the toilet rooms.

3.6.2 Plumbing Fixtures

The building's lavatories, water closets, and urinals are original and are lower flow plumbing fixtures, and do not require upgrades. These should be replaced thru attrition over the years with lavatories that are 2.5 GPM with push type faucets, water closets that are 1.6 GPF, and urinals that are 1.0 GPF.

4.0 ENERGY CONSERVATION MEASURES

4.1 ECM-1 Replace Domestic Water Heater

The Child Care Center has one electric domestic hot water heaters that provides hot water to the building. During periods of little or no domestic hot water use, the unit must still heat the water within its storage tank. Energy required maintaining the 40 gallons of hot water temperature set point during times of zero demand is known as standby losses; replacing this unit with a higher efficiency natural gas unit was evaluated.

According to the U.S. Department of Energy, 2.5% of stored capacity is lost every hour during HW heater standby. This value was applied to the total volume of the existing DHW heater storage tank to determine the annual standby losses. Proposed efficiency was based on a typical tankless type, high efficiency, condensing hot water heater. The new water heater will require gas and water piping modifications, venting, and electrical connections.

Domestic hot water heaters have an expected life of 12 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 40,800 kWh (-720 therms as the unit is switching from electric to natural gas) and $10,000.

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

ECM-1 Replace Domestic Water Heater

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
4,900	3,400	0	-60	400	0	400	(0.1)	50	12.3	12.1

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

This measure is recommended.

4.2 ECM-2 Lighting Replacement Upgrades

The classrooms and occupied spaces have magnetic ballast and utilize mainly 4 foot 40W T-12 fluorescent bulbs. Can lights and surface mounted standard bulb fixtures use biaxial compact fluorescent lights (CFLs) to replace original incandescent bulbs; there are also some incandescent bulbs/fixtures currently being used as well. A fluorescent lamp converts electrical power into useful light more efficiently than an incandescent lamp or T-12 bulbs. A comprehensive fixture survey was conducted of the entire building. Each switch and circuit was identified, and the number of fixtures, locations, and existing wattage established (Appendix C). There is an opportunity to continue to reduce that consumption even more by upgrading the classrooms to super T-8 fixtures, and the metal halides in the high bay entrance area to induction fixtures.

The existing exterior lighting system for this building consists of three 200 watt metal halide wall pack fixtures. These fixtures are utilized for building lighting during nighttime hours and are in operation from

sun down until sun up. Alternative LED lighting solutions are available to replace these fixtures that will reduce the wattage to 120 watts per fixture. It is suggested to replace the existing metal halide wall pack fixtures on a one for one basis with LED. The reduction in per fixture wattage will result in a reduced total exterior lighting connected wattage, therefore resulting in electrical energy savings. However, maintenance savings were not calculated or included in the payback analysis below due to unknown labor rates and knowledge of existing required maintenance time.

Energy savings for this measure were calculated by applying the existing and proposed fixture wattages to estimated times of operation. The difference between energy requirements resulted in a total annual savings of 8,000 kWh with an electrical demand reduction of about 4 kW. Supporting calculations, including assumptions for lighting hours and annual energy usage for each fixture, are provided in Appendix C.

Lighting has an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 120,000 kWh and $20,000.

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

ECM-2 Lighting Replacement Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
3,550	8,000	0	0	1,000	0	1,000	3.3	775	3.6	2.8

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

This measure is not recommended in lieu of ECM-4.

4.3 ECM-3 Lighting Controls Installation

The current lighting is controlled by manual switches. Lights are generally turned on in the morning and shut off at night. During occupied times, there are rooms that are not occupied, however the lights remain on. Adding occupancy controls to the individual rooms will automatically control the lights based on occupancy. The occupancy sensor can be wall mounted near the switch or placed at the ceiling for larger room coverage. All occupancy sensors are equipped with a manual override feature. These sensors are generally not recommended in public toilet rooms.

Lighting controls have an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 109,500 kWh and $13,900.

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

ECM-3 Lighting Controls Installation (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
1,600	7,300	0	0	900	0	900	7.7	245	1.8	1.5

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

This measure is not recommended in lieu of ECM-4.

4.4 ECM-4 Lighting Replacements with Lighting Controls

Due to interactive effects, the energy and cost savings for occupancy sensors and lighting upgrades are not cumulative. This measure is a combination of ECM-3 and ECM-4 to reflect actual expected energy and demand reduction.

The lighting retrofits and controls have an expected lifetime of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 198,000 kWh and $29,500.

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

ECM-4 Lighting Replacements with Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
5,100	13,200	0	0	1,700	0	1,700	3.9	1,020	3.0	2.4

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

This measure is recommended.

4.5 System Improvement Opportunities

The following items can be implemented by the owner to provide additional energy savings:

- It is recommended that vending misers be added to all college owned vending machines. It is also recommended the school requests vendor owned machines be upgraded or removed if they are not high efficiency equipment.

5.0 PROJECT INCENTIVES

5.1 Incentives Overview

5.1.1 New Jersey Pay For Performance Program

The most significant incentives are available from the New Jersey Pay for Performance (P4P) Program. The P4P program is designed for qualified energy conservation projects applied to facilities whose demand in any of the preceding 12 months exceeds 100 kW. This average minimum has been waived for buildings owned by local governments or municipalities and non-profit organizations, however. Facilities that meet this criterion must also achieve a minimum performance target of 15% energy reduction by using the EPA Portfolio Manager benchmarking tool before and after implementation of the measure(s). If the participant is a municipal electric company customer, and a customer of a regulated gas New Jersey Utility, only gas measures will be eligible under the Program. Available incentives are as follows:

Incentive #1: Energy Reduction Plan – This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP).

- Incentive Amount: $0.10/SF
- Minimum incentive: $5,000
- Maximum Incentive: $50,000 or 50% of Facility annual energy cost

The standard incentive pays $0.10 per square foot, up to a maximum of $50,000, not to exceed 50% of facility annual energy cost, paid after approval of application. For building audits funded by the New Jersey Board of Public Utilities, which receive an initial 75% incentive toward performance of the energy audit, facilities are only eligible for an additional $0.05 per square foot, up to a maximum of $25,000, rather than the standard incentive noted above.

Incentive #2: Installation of Recommended Measures – This incentive is based on projected energy savings as determined in Incentive #1 (Minimum 15% savings must be achieved), and is paid upon successful installation of recommended measures.

Electric

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

Gas

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

Incentive cap: 25% of total project cost

Incentive #3: Post-Construction Benchmarking Report – This incentive is paid after acceptance of a report proving energy savings over one year utilizing the Environmental Protection Agency (EPA) Portfolio Manager benchmarking tool.

Electric

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

Gas

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

If eligible, incentives #2 and #3 can be combined to yield additive savings.

Without existing sub meters in place, exact utility consumption for this building was unknown. Therefore, further analysis will need to take place before P4P incentives can be justified.

See Appendix D for calculations.

5.1.2 New Jersey Smart Start Program

For this program, specific incentives for energy conservation measures are calculated on an individual basis utilizing the 2011 New Jersey Smart Start incentive program. This program provides incentives dependent upon mechanical and electrical equipment. If applicable, incentives from this program are reflected in the ECM summaries and attached appendices.

If the complex qualifies and enters into the New Jersey Pay for Performance Program, all energy savings will be included in the total site energy reduction, and savings will be applied towards the Pay for Performance incentive. A project is not applicable for both New Jersey incentive programs.

5.1.3 Direct Install Program

The Direct Install Program targets small and medium sized facilities where the peak electrical demand does not exceed 150 kW in any of the previous 12 months. Buildings must be located in New Jersey and served by one of the state's public, regulated electric or natural gas utility companies. On a case-by-case basis, the program manager may accept a project for a customer that is within 10% of the 150 kW peak demand threshold.

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

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

The facility is not eligible to receive funding from the Direct Install Program due to the monthly demand exceeding 150 kW.

5.1.4 Energy Savings Improvement Plans (ESIP)

The Energy Savings Improvement Program (ESIP) allows government agencies to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. Under the recently enacted Chapter 4 of the Laws of 2009 (the law), the ESIP provides all

government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources.

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

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

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

6.0 ALTERNATIVE ENERGY SCREENING EVALUATION

6.1 Solar

6.1.1 Photovoltaic Rooftop Solar Power Generation

The facility was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter. The building’s roof has sufficient room to install a large solar cell array. All rooftop areas have been replaced, and are in good condition. It is recommended to install a permanent PV array at this time.

The PVWATTS solar power generation model was utilized to calculate PV power generation. The closest city available in the model is Newark, New Jersey and a fixed tilt array type was utilized to calculate energy production. The PVWATT solar power generation model is provided in Appendix F.

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

Installation of (PV) arrays in the state New Jersey will allow the owner to participate in the New Jersey solar renewable energy certificates program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production; these credits can be traded for period of 15 years from the date of installation. The average SREC value per credit is estimated to be about $120/ SREC per year based on current market data, and this number was utilized in the cash flow for this report.

The available roof area justifies the use of a 25 kW PV solar array. The system costs for PV installations were derived from contractor budgetary pricing in the state of New Jersey for estimates of total cost of system installation. It should be noted that the cost of installation is currently about $4.00 per watt or $4,000 per kW of installed system. Other cost considerations will also need to be considered. PV panels have an approximate 20 year life span; however, the inverter device that converts DC electricity to AC has a life span of 10 to 12 years and will need to be replaced multiple times during the useful life of the PV system.

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

Photovoltaic (PV) Rooftop Solar Power Generation – 16 kW System

Budgetary Cost	Annual Utility Savings				Total Savings	Federal Tax Credit *	New Jersey Renewable SREC**	Payback (without incentive)	Payback (with incentives)
	Electricity		Natural Gas	Total					
$	kW	kWh	Therms	$	$	$	$	Years	Years
$100,000	0.0	30,020	0	$3,900	$3,900	0	$2,852	>25	14.8

* 30% federal tax credit

** Solar Renewable Energy Certificate Program (SREC) for 2012 is $120/1000kwh

This measure is not recommended.

6.1.2 Solar Thermal Hot Water Plant

Active solar thermal systems use solar collectors to gather the sun's energy to heat water, another fluid, or air. An absorber in the collector converts the sun's energy into heat. The heat is then transferred by circulating water, antifreeze, or sometimes air to another location for immediate use or storage for later utilization. Applications for active solar thermal energy include providing hot water, heating swimming pools, space heating, and preheating air in residential and commercial buildings.

A standard solar hot water system is typically composed of solar collectors, heat storage vessel, piping, circulators, and controls. Systems are typically integrated to work alongside a conventional heating system that provides heat when solar resources are not sufficient. The solar collectors are usually placed on the roof of the building, oriented south, and tilted around the site's latitude, to maximize the amount of radiation collected on a yearly basis.

Several options exist for using active solar thermal systems for space heating. The most common method involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system). The most practical system would transfer the heat from the panels to thermal storage tanks and transfer solar produced thermal energy to use for domestic hot water production. DHW is presently produced by gas-fired water heaters and, therefore, this measure would offer natural gas utility savings.

Currently, an incentive is not available for installation of thermal solar systems; a Federal tax credit of 30% of installation cost for the thermal applications is available.

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

Solar Thermal Hot Water Plant

Budgetary Cost	Annual Utility Savings				Total Savings	Federal Tax Credit *	Payback (without incentive)	Payback (with incentives)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	$	$	Years	Years
$15,000	0.0	4,400	0	$580	$580	4,500	>25	18.1

* 30% federal tax credit

This is not recommended since the facility is not occupied year-round and domestic hot water demand is not excessive.

6.2 Demand Response Curtailment

Presently, electricity is delivered by South Jersey Energy Company, which receives the electricity from regional power grid RFC. South Jersey Energy Company is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia including the State of New Jersey.

Utility Curtailment is an agreement with the utility provider's regional transmission organization and an approved Curtailment Service Provider (CSP) to shed electrical load by either turning major equipment off or energizing all or part of a facility utilizing an emergency generator; therefore, reducing the electrical demand on the utility grid. This program is to benefit the utility company during high demand periods and utility provider offers incentives to the CSP to participate in this program. Enrolling in the program will require program participants to drop electrical load or turn on emergency generators during high electrical demand conditions or during emergencies. Part of the program also will require that program participants reduce their required load or run emergency generators with notice to test the system.

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. From June 2011 through April 2012, the Child Care Building had an electricity demand of 1 kW.

This measure is not recommended because the facility does not meet the minimum energy requirement.

7.0 EPA PORTFOLIO MANAGER

The EPA Portfolio Manager benchmarking tool was used to assess the building's energy performance. Portfolio Manager provides a Site and Source Energy Use Intensity (EUI), as well as an Energy Star performance rating for qualifying building types. The EUIs are provided in kBtu/ft^2/year, and the performance rating represents how energy efficient a building is on a scale of 1 to 100, with 100 being the most efficient. In order for a building to receive and Energy Star label, the energy benchmark rating must be at least 75. As energy use decreases from implementation of the proposed ECMs, the Energy Star rating will increase.

The Site EUI is the amount of heat and electricity consumed by a building as reflected in utility bills. Site energy may be delivered to a facility in the form of primary energy, which is raw fuel burned to create heat or electricity (such as natural gas or oil), or as secondary energy, which is the product created from a raw fuel (such as electricity or district steam). Site EUI is a measure of a building's annual energy utilization per square foot. Site EUI is a good measure of a building's energy use and is utilized regularly for comparison of energy performance for similar building types.

$$\textbf{\textit{Site Energy Intensity}} = \frac{(\textit{Electric Usage in kBtu + Natural Gas in kBtu})}{\textit{Building Square Footage}}$$

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

$$\textbf{\textit{Source Energy Intensity}} = \frac{(\textit{Electric Usage in kBtu X Site/Source Ratio + Natural Gas in kBtu X Site/Source Ratio})}{\textit{Building Square Footage}}$$

The EPA Score, Site EUI, and Source EUI for the Child Care Center are as follows:

Energy Intensity	Camden County College Child Care Center	National Average
EPA Score	N/A	N/A
Site (kBtu/sf/year)	44	N/A
Source (kBtu/sf/year)	72	N/A

The Child Care Center does not qualify for performance benchmarking in Portfolio Manager because the program does not currently include this building type. However it is expected to begin benchmarking these buildings in the near future. It is suggested that the client check for updates in the future to see if any of their buildings qualify for an Energy Star label. For the building to qualify for the Energy Star label the EPA score is required to be above 75. There are several energy conservation measures recommended in this report, that if implemented will further reduce the energy use intensity and increase the EPA score of the facility.

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

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

The user name ([redacted]) and password ([redacted]) for the building's EPA Portfolio Manager Account have been provided to Ed Carney, Director of Public Safety for the Camden County College.

8.0 CONCLUSIONS & RECOMMENDATIONS

Summary of Energy Conservation Measures							
Energy Conservation Measure		**Approx. Costs ($)**	**Approx. Savings ($/year)**	**Payback (Years) w/o Incentive**	**Potential Incentive ($)***	**Payback (Years) w/ Incentive**	**Recommended For Implementation**
ECM-1	Replace Domestic Water Heater (DWH)	4,900	400	12.3	50	12.1	X
4	Lighting Replacements with Lighting Controls (Occupancy Sensors)	5,100	1,700	3.0	1,020	2.4	X

APPENDIX A

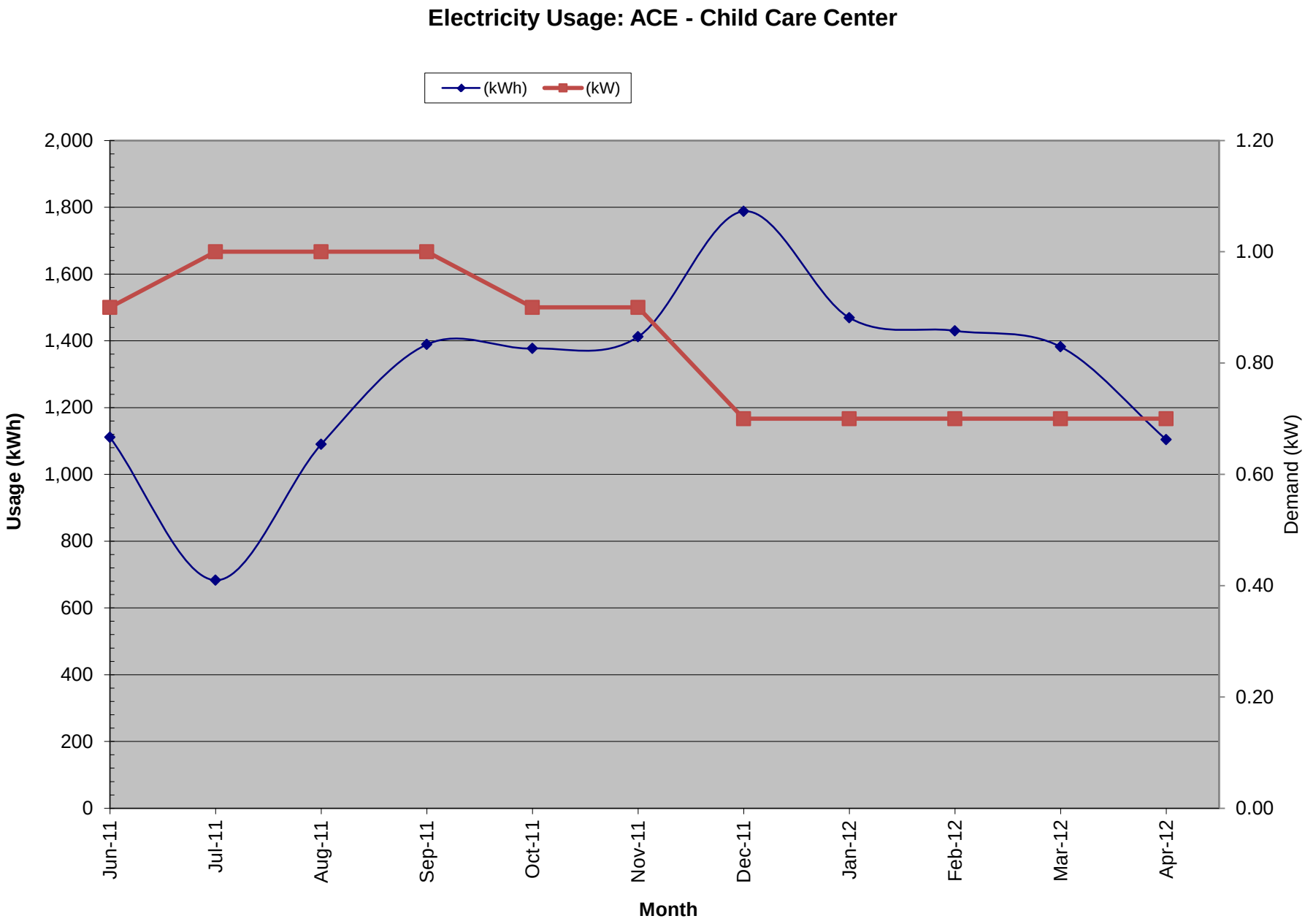
Utility Usage Analysis, Energy Suppliers List

Camden County Community College
200 College Drive, Blackwood, NJ 08012

Electric Service
Delivery - Atlantic City Electric
Supplier - Atlantic City Electric

For Service at: **Child Care Center**
Account No.: **02410099951**
Meter No.: **105763996**

			Charges			Unit Costs		
Month	Consumption (kWh)	Demand (kW)	Total ($)	Delivery ($)	Supply ($)	Blended Rate ($/kWh)	Consumption ($/kWh)	Demand ($/kW)
June-11	1,111	0.90	$190.31	$75.78	$114.53	$ 0.171	$ 0.162	$ 11.26
July-11	683	1.00	$124.84	$52.77	$72.07	$ 0.183	$ 0.167	$ 10.75
August-11	1,090	1.00	$185.82	$74.42	$111.40	$ 0.170	$ 0.161	$ 10.39
September-11	1,389	1.00	$233.74	$92.54	$141.20	$ 0.168	$ 0.160	$ 11.82
October-11	1,377	0.90	$229.37	$80.97	$148.40	$ 0.167	$ 0.161	$ 9.29
November-11	1,412	0.90	$238.31	$84.46	$153.85	$ 0.169	$ 0.162	$ 10.43
December-11	1,788	0.70	$292.45	$100.47	$191.98	$ 0.164	$ 0.160	$ 9.80
January-12	1,469	0.70	$82.81	$82.81		$ 0.056	$ 0.055	$ 3.86
February-12	1,430	0.70	$82.93	$82.93		$ 0.058	$ 0.056	$ 4.40
March-12	1,382	0.70	$79.19	$79.19		$ 0.057	$ 0.055	$ 3.99
April-12	1,104	0.70	$66.70	$66.70		$ 0.060	$ 0.058	$ 4.13
Total (All)	**14,235**	**1.00**	**$1,806.47**	**$873.04**	**$933.43**	**$ 0.127**	**$ 0.121**	**$ 8.60**


Electricity Usage: ACE - Child Care Center
(kWh)
(kW)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Usage (kWh)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Demand (kW)
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
Jan-12
Feb-12
Mar-12
Apr-12
Month

APPENDIX B

Equipment Inventory

New Jersey BPU Energy Audit Program
CHA #24364
Camden County College
Child Care Center
Original Construction Date: 1969

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size/Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
RTU-1	1	TRANE	YSC092E3EMA160	114910228L	HVAC / DX Cooling Natural Gas Heating	3000 CFM / CLG: 94 MBH HTG: 120 MBH / 1.0 HP SF, 0.75 HP RF EER = 11.2	ROOF ABOVE AREA BEING SERVED	WEST HALF OF BUILDING	2011	14	Good Condition
RTU-2	1	TRANE	YSC092E3EMA160	114910216L	HVAC / DX Cooling Natural Gas Heating	3000 CFM / CLG: 94 MBH HTG: 120 MBH / 1.0 HP SF, 0.75 HP RF EER = 11.2	ROOF ABOVE AREA BEING SERVED	EAST HALF OF BUILDING	2011	14	Good Condition
DHW-1	1	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	Domestic Hot Water Heating / Electric	4.5 kW / 40 gal	STORAGE ROOM	ENTIRE BUILDING	2011	11	Good Condition

Energy Audit of Camden County College (Child Care Building)

CHA Project No. 24364

Existing Lighting

Cost of Electricity: **$0.131** **$/kWh**

$5.94 **$/kW**

		EXISTING CONDITIONS									
	Area Description	**No. of Fixtures**	**Standard Fixture Code**	**NYSERDA Fixture Code**	**Watts per Fixture**	**kW/Space**	**Exist Control**	**Annual Hours**	**Retrofit Control**	**Annual kWh**	
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	Retrofit control device	(kW/space) * (Annual Hours)	Notes
227	Exterior	2	**W60CF1**	F81EL	60	0.12	SW	2500	None	300	
9A	Exterior	3	**High Bay MH 200 35 Feet High**	MH200/1	232	0.70	SW	2500	None	1,740	
234	Entrance	6	**SP 100 W I 2**	i100/2	200	1.20	SW	2500	None	3,000	
162A	Reception Desk	3	**4' 4-LAMP T-12**	F44EL	120	0.36	SW	2125	C-OCC	765	
162A	Classroom 1 (Left)	21	**4' 4-LAMP T-12**	F44EL	120	2.52	SW	2125	C-OCC	5,355	
162A	Classroom 2 (Right)	20	**4' 4-LAMP T-12**	F44EL	120	2.40	SW	2125	C-OCC	5,100	
162A	Hallway	7	**4' 4-LAMP T-12**	F44EL	120	0.84	SW	2500	None	2,100	
162A	Kitchen	2	**4' 4-LAMP T-12**	F44EL	120	0.24	SW	2125	OCC	510	
71	Sprinkler Control Closet	1	**I 60**	I60/1	60	0.06	SW	2125	OCC	128	
162A	Backroom	8	**4' 4-LAMP T-12**	F44EL	120	0.96	SW	2125	OCC	2,040	
162A	Children's Bathroom (Left)	2	**4' 4-LAMP T-12**	F44EL	120	0.24	SW	2250	C-OCC	540	
162A	Children's Bathroom (Right)	2	**4' 4-LAMP T-12**	F44EL	120	0.24	SW	2250	C-OCC	540	
71	Janitor's Closet	1	**I 60**	I60/1	60	0.06	SW	2125	OCC	128	
162A	Storage Closet/Laundry	2	**4' 4-LAMP T-12**	F44EL	120	0.24	SW	2125	OCC	510	
11A	Adult's Bathroom	1	**4' 2-LAMP T-12**	F42EL	60	0.06	SW	2125	OCC	128	
61A	Office (Main)	1	**4' 3-LAMP T-12**	F43EL	92	0.09	SW	2000	OCC	184	
162A	Office (Right)	2	**4' 4-LAMP T-12**	F44EL	120	0.24	SW	2125	OCC	510	
	Total	**84**				**10.57**				**23,577**	

APPENDIX C

ECM Calculations

Summary of Energy Conservation Measures							
Energy Conservation Measure		**Approx. Costs ($)**	**Approx. Savings ($/year)**	**Payback (Years) w/o Incentive**	**Potential Incentive ($)***	**Payback (Years) w/ Incentive**	**Recommended For Implementation**
ECM-1	Replace Domestic Water Heater (DWH)	4,900	380	12.9	50	12.8	
ECM-2	Lighting Replacement Upgrades	3,550	1,000	3.6	775	2.8	X
ECM-3	Lighting Controls Installation (Occupancy Sensors)	1,600	900	1.8	245	1.5	X
ECM-4	Lighting Replacements with Lighting Controls (Occupancy Sensors)	5,100	1,700	3.0	1,020	2.4	X

Camden County College Blackwood Campus- NJBPU
CHA Project #24364
Child Care Building

ECM Summary Sheet

ECM-1 Replace Domestic Water Heater (DWH)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
4,900	3,400	0	-60	400	0	400	(0.1)	50	12.3	12.1

ECM-2 Lighting Replacement Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
3,550	8,000	0	0	1,000	0	1,000	3.3	775	3.6	2.8

ECM-3 Lighting Controls Installation (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
1,600	7,300	0	0	900	0	900	7.7	245	1.8	1.5

ECM-4 Lighting Replacements with Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
$	kWh	kW	Therms	$	$	$		$	Years	Years
5,100	13,200	0	0	1,700	0	1,700	3.9	1,020	3.0	2.4

Camden County College Blackwood Campus- NJBPU
CHA Project #24364

Utility Costs		Yearly Usage	MTCDE	Building Area
$ 0.127	$/kWh blended		0.00042021	4,650
$ 0.121	$/kWh consumpt	14,235	0.00042021	
$ 8.60	$/kW	1	0	
$ 0.80	$/Therm	1,442	0.00533471	
$ -	$/kgals	-	0	

Child Care Building

	Item	Savings						Cost	Simple Payback	MTCDE	Life Expectancy	NJ Smart Start Incentives
		kW	kWh	therms	cooling kWh	kgal/yr	$					
ECM-1	Replace Domestic Water Heater (DWH)	0.0	3,400	-60	0	0	$ 380	$ 4,900	12.9	1.1	12	$ 50
ECM-2	Lighting Replacement Upgrades	0.0	8,000	0	0	0	$ 1,000	$3,550	3.6	3.4	15	$ 775
ECM-3	Lighting Controls Installation (Occupancy Sensors)	0.0	7,300	0	0	0	$ 900	$1,600	1.8	3.1	15	$ 245
ECM-4	Lighting Replacements with Lighting Controls (Occupancy Sensors)	0.0	13,200	0	0	0	$ 1,700	$5,100	3.0	5.5	15	$ 1,020

Camden County College Blackwood Campus- NJBPU
CHA Project #24364
Child Care Building

ECM-1: Replace Electric DHW Heater w/ Condensing Gas-Fired DHW Heater

ECM Summary
During periods of little or no domestic hot water use, domestic hot water heaters must still heat the water within their storage tank. Energy required maintaining the hot water temperature setpoint during times of zero demand is known as standby losses. According to the U.S. Department of Energy, 2.5% of stored capacity is lost every hour during HW heater standby. This value was applied to the total volume of the existing DHW heater storage tank to determine the annual standby losses. Proposed efficiency was based on a tank-type, high efficiency condensing hot water heater.

Item	Value	Units	Formula/Comments
Occupied days per week	5	days/wk	
Water supply Temperature	60	˚F	Termperature of water coming into building
Hot Water Temperature	130	˚F	
Hot Water Usage per day	39	gal/day	Calculated from usage below
Annual Hot Water Energy Demand	5,969	MBTU/yr	Energy required to heat annual quantity of hot water to setpoint
Existing Tank Size	40	Gallons	Per manufacturer nameplate
Hot Water Temperature	130	˚F	Per building personnel
Average Room Temperature	70	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.5	MBH	
Annual Standby Hot Water Load	4,380	MBTU/yr	
Total Annual Hot Water Demand (w/ standby losses)	10,349	Mbtu/yr	Building demand plus standby losses
Existing Water Heater Efficiency	90%		Per Manufacturer
Total Annual Energy Required	11,499	Mbtu/yr	
Total Annual Electric Required	**3,400**	**kWh/yr**	**Electrical Savings**
Average Annual Electric Demand	0.39	kW	
Peak Electric Demand	**4.5**	**kW**	**Per Manufacturer's Nameplate (Demand Savings)**
New Tank Size	0	Gallons	Based on Rinnai tankless water heater
Hot Water Temperature	130	˚F	
Average Room Temperature	70	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.0	MBH	
Annual Standby Hot Water Load	0	MBTU/yr	
Prop Annual Hot Water Demand (w/ standby losses)	5,969	MBTU/yr	
Proposed Avg. Hot water heater efficiency	92%		Based on Rinnai instantaneous, tankless DHW heater
Proposed Total Annual Energy Required	6,489	MBTU/yr	
Proposed Fuel Use	**60**	**Therms/yr**	Standby Losses and inefficient DHW heater eliminated
Elec Utility Demand Unit Cost	$8.60	$/kW	
Elec Utility Supply Unit Cost	$0.127	$/kWh	
NG Utility Unit Cost	$0.80	$/Therm	
Existing Operating Cost of DHW	$896	$/yr	
Proposed Operating Cost of DHW	$48	$/yr	
Annual Utility Cost Savings	**$848**	**$/yr**	

Daily Hot Water Demand

			#USES PER DAY		FULL TIME OCCUPANTS**				
FIXTURE	*BASE WATER USE GPM	DURATION OF USE (MIN)	MALE	FEMALE	MALE	FEMALE	TOTAL GAL/DAY	% HOT WATER	TOTAL HW GAL/DAY
LAVATORY (Low-Flow Lavs use 0.5 GPM)	2.5	0.25	3	3	12	12	45	50%	23
SHOWER	2.5	5	1	1			0	75%	0
KITCHEN SINK	2.5	0.5	1	1	2		3	75%	2
MOP SINK	2.5	2	1	1	4		20	75%	15
Dishwasher (gal per u	10	1	1	0			0	100%	0
						TOTAL	68		**39**

*GPM is per standard fixtures, adjust as necessary if actual GPM is known.
**These are the occupanct that use the fixtures. If fixture does not exist change to (0).

Camden County College Blackwood Campus- NJBPU
CHA Project #24364
Child Care Building

ECM-2: Replace Electric & Gas-Fired DHW Heaters w/ Condensing Gas-Fired DHW Heater - Cost

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Electric DHW Heater Removal	1	EA	$ -	$ 50		$ -	$ 68	$ -	$ 68	
High Efficiency Gas-Fired tankless DHW Heater	1	EA	$ 1,200	$ 300		$ 1,320	$ 405	$ -	$ 1,725	
Miscellaneous Electrical	1	EA	$ 50	$ 100		$ 55	$ 135	$ -	$ 190	
Venting Kit	1	EA	$ 450	$ 650		$ 495	$ 878	$ -	$ 1,373	
Miscellaneous Piping and Valves	1	LS	$ 300			$ 330	$ -	$ -	$ 330	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

$ 3,685	Subtotal
$ 369	10% Contingency
$ 811	20% Contractor O&P
$ -	0% Engineering
$ 4,900	**Total**

ECM-2 Lighting Replacements

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$3,550	**3.5**	**8,000**	**0**	**$1,304**	**0**	**$1,304**	**$775**	**2.7**	**2.1**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-3 Install Occupancy Sensors

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$1,600	**0.0**	**7,300**	**0**	**$959**	**0**	**$959**	**$245**	**1.7**	**1.4**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-4 Lighting Replacements with Occupancy Sensors

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$5,100	**3.5**	**13,200**	**0**	**$1,987**	**0**	**$1,987**	**$1,020**	**2.6**	**2.1**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

Energy Audit of Camden County College (Child Care Building)

CHA Project No. 24364

ECM-2 Lighting Replacements

Cost of Electricity: **$0.131 $/kWh**

$5.94 $/kW

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	**No. of Fixtures**	**Standard Fixture Code**	**NYSERDA Fixture Code**	**Watts per Fixture**	**kW/Space**	**Exist Control**	**Annual Hours**	**Annual kWh**	**Number of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**Retrofit Control**	**Annual Hours**	**Annual kWh**	**Annual kWh Saved**	**Annual kW Saved**	**Annual $ Saved**	**Retrofit Cost**	**NJ Smart Start Lighting Incentive**	**Simple Payback With Out Incentive**	**Simple Payback**
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
227	Exterior	2	W60CF1	F81EL	60	0.1	SW	2500	300	2	CF42W	CF42/1-L	48	0.1	SW	2,500	240	60	0.0	$ 9.60	$ 405.00		42.2	42.2
9A	Exterior	3	High Bay MH 200 35 Feet High	MH200/1	232	0.7	SW	2500	1,740	3	FXLED78	FXLED78/1	78	0.2	SW	2,500	585	1,155	0.5	$ 184.74	$ 2,116.50	$75	11.5	11.1
234	Entrance	6	SP 100 W I 2	i100/2	200	1.2	SW	2500	3,000	6	WP 42 1	CF42/2-L	100	0.6	SW	2,500	1,500	1,500	0.6	$ 239.92	$ 571.50		2.4	2.4
162A	Reception Desk	3	4' 4-LAMP T-12	F44EL	120	0.4	SW	2125	765	3	F28T8	F44SSILL-R	86	0.3	SW	2,125	548	217	0.1	$ 35.76	$ -		0.0	0.0
162A	Classroom 1 (Left)	21	4' 4-LAMP T-12	F44EL	120	2.5	SW	2125	5,355	21	F28T8	F44SSILL-R	86	1.8	SW	2,125	3,838	1,517	0.7	$ 250.31	$ -		0.0	0.0
162A	Classroom 2 (Right)	20	4' 4-LAMP T-12	F44EL	120	2.4	SW	2125	5,100	20	F28T8	F44SSILL-R	86	1.7	SW	2,125	3,655	1,445	0.7	$ 238.39	$ -	$500	0.0	-2.1
162A	Hallway	7	4' 4-LAMP T-12	F44EL	120	0.8	SW	2500	2,100	7	F28T8	F44SSILL-R	86	0.6	SW	2,500	1,505	595	0.2	$ 95.17	$ -	$175	0.0	-1.8
162A	Kitchen	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2125	510	2	F28T8	F44SSILL-R	86	0.2	SW	2,125	366	145	0.1	$ 23.84	$ -		0.0	0.0
71	Sprinkler Control Closet	1	I 60	I60/1	60	0.1	SW	2125	128	1	CF 26	CFQ26/1-L	27	0.0	SW	2,125	57	70	0.0	$ 11.57	$ 40.50	$25	3.5	1.3
162A	Backroom	8	4' 4-LAMP T-12	F44EL	120	1.0	SW	2125	2,040	8	F28T8	F44SSILL-R	86	0.7	SW	2,125	1,462	578	0.3	$ 95.36	$ -		0.0	0.0
162A	Children's Bathroom (Left)	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2250	540	2	F28T8	F44SSILL-R	86	0.2	SW	2,250	387	153	0.1	$ 24.96	$ -		0.0	0.0
162A	Children's Bathroom (Right)	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2250	540	2	F28T8	F44SSILL-R	86	0.2	SW	2,250	387	153	0.1	$ 24.96	$ -		0.0	0.0
71	Janitor's Closet	1	I 60	I60/1	60	0.1	SW	2125	128	1	CF 26	CFQ26/1-L	27	0.0	SW	2,125	57	70	0.0	$ 11.57	$ 40.50		3.5	3.5
162A	Storage Closet/Laundry	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2125	510	2	F28T8	F44SSILL-R	86	0.2	SW	2,125	366	145	0.1	$ 23.84	$ -		0.0	0.0
11A	Adult's Bathroom	1	4' 2-LAMP T-12	F42EL	60	0.1	SW	2125	128	1	F42ILL-R	F42SSILL-R	45	0.0	SW	2,125	96	32	0.0	$ 5.26	$ 250.00		47.5	47.5
61A	Office (Main)	1	4' 3-LAMP T-12	F43EL	92	0.1	SW	2000	184	1	F28T8	F43SSILL-R	66	0.1	SW	2,000	132	52	0.0	$ 8.69	$ 128.25		14.8	14.8
162A	Office (Right)	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2125	510	2	F28T8	F44SSILL-R	86	0.2	SW	2,125	366	145	0.1	$ 23.84	$ -		0.0	0.0
	Total	**84**				**10.6**			**23,577**	**84**			**1,251**	**7.0**			**15,546**	**8,031**	**3.5**	**$1,308**	**$3,550**	**$775**		
																	Demand Savings			**3.5**	**$252**			
																	kWh Savings			**8,000**	**$1,051**			
																	Total savings				**$1,304**		**2.7**	**2.1**

Energy Audit of Camden County College (Child Care Building)

CHA Project No. 24364

ECM-3 Install Occupancy Sensors

Cost of Electricity: **$0.131 $/kWh**

$5.94 $/kW

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	**No. of Fixtures**	**Standard Fixture Code**	**NYSERDA Fixture Code**	**Watts per Fixture**	**kW/Space**	**Exist Control**	**Annual Hours**	**Annual kWh**	**Number of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**Retrofit Control**	**Annual Hours**	**Annual kWh**	**Annual kWh Saved**	**Annual kW Saved**	**Annual $ Saved**	**Retrofit Cost**	**NJ Smart Start Lighting Incentive**	**Simple Payback With Out Incentive**	**Simple Payback**
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kW Saved) * ($/kWh)	Cost for renovations to lighting system		Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
227	Exterior	2	W60CF1	F81EL	60	0.1	SW	2500	300.0	2	W60CF1	F81EL	60	0.1	None	2500	300.0	0.0	0.0	$0.00	$0.00	$0.00		
9A	Exterior	3	High Bay MH 200 35 Feet High	MH200/1	232	0.7	SW	2500	1,740.0	3	High Bay MH 200 35 Feet High	MH200/1	232	0.7	None	2500	1,740.0	0.0	0.0	$0.00	$0.00	$0.00		
234	Entrance	6	SP 100 W I 2	i100/2	200	1.2	SW	2500	3,000.0	6	SP 100 W I 2	i100/2	200	1.2	None	2500	3,000.0	0.0	0.0	$0.00	$0.00	$0.00		
162A	Reception Desk	3	4' 4-LAMP T-12	F44EL	120	0.4	SW	2125	765.0	3	4' 4-LAMP T-12	F44EL	120	0.4	C-OCC	1200	432.0	333.0	0.0	$43.77				
162A	Classroom 1 (Left)	21	4' 4-LAMP T-12	F44EL	120	2.5	SW	2125	5,355.0	21	4' 4-LAMP T-12	F44EL	120	2.5	C-OCC	1200	3,024.0	2,331.0	0.0	$306.37	$202.50	$35.00	0.3	0.3
162A	Classroom 2 (Right)	20	4' 4-LAMP T-12	F44EL	120	2.4	SW	2125	5,100.0	20	4' 4-LAMP T-12	F44EL	120	2.4	C-OCC	1200	2,880.0	2,220.0	0.0	$291.78				
162A	Hallway	7	4' 4-LAMP T-12	F44EL	120	0.8	SW	2500	2,100.0	7	4' 4-LAMP T-12	F44EL	120	0.8	None	2500	2,100.0	0.0	0.0	$0.00	$0.00	$0.00		
162A	Kitchen	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2125	510.0	2	4' 4-LAMP T-12	F44EL	120	0.2	OCC	1200	288.0	222.0	0.0	$29.18	$118.75	$20.00	4.1	3.4
71	Sprinkler Control Closet	1	I 60	I60/1	60	0.1	SW	2125	127.5	1	I 60	I60/1	60	0.1	OCC	1200	72.0	55.5	0.0	$7.29	$118.75	$20.00	16.3	13.5
162A	Backroom	8	4' 4-LAMP T-12	F44EL	120	1.0	SW	2125	2,040.0	8	4' 4-LAMP T-12	F44EL	120	1.0	OCC	1200	1,152.0	888.0	0.0	$116.71	$118.75	$20.00	1.0	0.8
162A	Children's Bathroom (Left)	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2250	540.0	2	4' 4-LAMP T-12	F44EL	120	0.2	C-OCC	1000	240.0	300.0	0.0	$39.43	$202.50	$35.00	5.1	4.2
162A	Children's Bathroom (Right)	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2250	540.0	2	4' 4-LAMP T-12	F44EL	120	0.2	C-OCC	1000	240.0	300.0	0.0	$39.43	$202.50	$35.00	5.1	4.2
71	Janitor's Closet	1	I 60	I60/1	60	0.1	SW	2125	127.5	1	I 60	I60/1	60	0.1	OCC	1200	72.0	55.5	0.0	$7.29	$118.75	$20.00	16.3	13.5
162A	Storage Closet/Laundry	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2125	510.0	2	4' 4-LAMP T-12	F44EL	120	0.2	OCC	1200	288.0	222.0	0.0	$29.18	$118.75	$20.00	4.1	3.4
11A	Adult's Bathroom	1	4' 2-LAMP T-12	F42EL	60	0.1	SW	2125	127.5	1	4' 2-LAMP T-12	F42EL	60	0.1	OCC	1200	72.0	55.5	0.0	$7.29	$118.75	$20.00	16.3	13.5
61A	Office (Main)	1	4' 3-LAMP T-12	F43EL	92	0.1	SW	2000	184.0	1	4' 3-LAMP T-12	F43EL	92	0.1	OCC	1000	92.0	92.0	0.0	$12.09	$118.75	$0.00	9.8	9.8
162A	Office (Right)	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2125	510.0	2	4' 4-LAMP T-12	F44EL	120	0.2	OCC	1200	288.0	222.0	0.0	$29.18	$118.75	$20.00	4.1	3.4
	Total	**84**				**10.6**			**23,577**	**84**				**11**			**16,280**	**7,297**	**0**	**959**	**$1,600**	**245**		
																		Demand Savings		**0.0**	**$0**			
																		kWh Savings		**7,300**	**$959**			
																		Total Savings			**$959**		**1.7**	**1.4**

Energy Audit of Camden County College (Child Care Building)

CHA Project No. 24364

ECM-4 Lighting Replacements with Occupancy Sensors

Cost of Electricity: **$0.131 $/kWh**

$5.94 $/kW

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	NYSERDA Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
227	Exterior	2	W60CF1	F81EL	60	0.1	SW	2500	300	2	CF42W	CF42/1-L	48	0.1	None	2,500	240	60	0.0	$ 9.60	$ 405.00	$ -	42.2	42.2
9A	Exterior	3	High Bay MH 200 35 Feet High	MH200/1	232	0.7	SW	2500	1,740	3	FXLED78	FXLED78/1	78	0.2	None	2,500	585	1,155	0.5	$ 184.74	$ 2,116.50	$ 75	11.5	11.1
234	Entrance	6	SP 100 W I 2	i100/2	200	1.2	SW	2500	3,000	6	WP 42 1	CF42/2-L	100	0.6	None	2,500	1,500	1,500	0.6	$ 239.92	$ 571.50	$ -	2.4	2.4
162A	Reception Desk	3	4' 4-LAMP T-12	F44EL	120	0.4	SW	2125	765	3	F28T8	F44SSILL-R	86	0.3	C-OCC	1,200	310	455	0.1	$ 67.13	$ 202.50	$ 35	3.0	2.5
162A	Classroom 1 (Left)	21	4' 4-LAMP T-12	F44EL	120	2.5	SW	2125	5,355	21	F28T8	F44SSILL-R	86	1.8	C-OCC	1,200	2,167	3,188	0.7	$ 469.88	$ -	$ -	0.0	0.0
162A	Classroom 2 (Right)	20	4' 4-LAMP T-12	F44EL	120	2.4	SW	2125	5,100	20	F28T8	F44SSILL-R	86	1.7	C-OCC	1,200	2,064	3,036	0.7	$ 447.50	$ -	$ 500	0.0	-1.1
162A	Hallway	7	4' 4-LAMP T-12	F44EL	120	0.8	SW	2500	2,100	7	F28T8	F44SSILL-R	86	0.6	None	2,500	1,505	595	0.2	$ 95.17	$ -	$ 175	0.0	-1.8
162A	Kitchen	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2125	510	2	F28T8	F44SSILL-R	86	0.2	OCC	1,200	206	304	0.1	$ 44.75	$ 118.75	$ 20	2.7	2.2
71	Sprinkler Control Closet	1	I 60	I60/1	60	0.1	SW	2125	128	1	CF 26	CFQ26/1-L	27	0.0	OCC	1,200	32	95	0.0	$ 14.85	$ 159.25	$ 45	10.7	7.7
162A	Backroom	8	4' 4-LAMP T-12	F44EL	120	1.0	SW	2125	2,040	8	F28T8	F44SSILL-R	86	0.7	OCC	1,200	826	1,214	0.3	$ 179.00	$ 118.75	$ 20	0.7	0.6
162A	Children's Bathroom (Left)	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2250	540	2	F28T8	F44SSILL-R	86	0.2	C-OCC	1,000	172	368	0.1	$ 53.21	$ 202.50	$ 35	3.8	3.1
162A	Children's Bathroom (Right)	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2250	540	2	F28T8	F44SSILL-R	86	0.2	C-OCC	1,000	172	368	0.1	$ 53.21	$ 202.50	$ 35	3.8	3.1
71	Janitor's Closet	1	I 60	I60/1	60	0.1	SW	2125	128	1	CF 26	CFQ26/1-L	27	0.0	OCC	1,200	32	95	0.0	$ 14.85	$ 159.25	$ 20	10.7	9.4
162A	Storage Closet/Laundry	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2125	510	2	F28T8	F44SSILL-R	86	0.2	OCC	1,200	206	304	0.1	$ 44.75	$ 118.75	$ 20	2.7	2.2
11A	Adult's Bathroom	1	4' 2-LAMP T-12	F42EL	60	0.1	SW	2125	128	1	F42ILL-R	F42SSILL-R	45	0.0	OCC	1,200	54	74	0.0	$ 10.73	$ 368.75	$ 20	34.4	32.5
61A	Office (Main)	1	4' 3-LAMP T-12	F43EL	92	0.1	SW	2000	184	1	F28T8	F43SSILL-R	66	0.1	OCC	1,000	66	118	0.0	$ 17.36	$ 247.00	$ -	14.2	14.2
162A	Office (Right)	2	4' 4-LAMP T-12	F44EL	120	0.2	SW	2125	510	2	F28T8	F44SSILL-R	86	0.2	OCC	1,200	206	304	0.1	$ 44.75	$ 118.75	$ 20	2.7	2.2
	Total	**84**				**10.6**			**23,577**	**84**				**7.0**			**10,344**		**3.5**	**$1,991**	**$5,100**	**1,020**		
																		Demand Savings		**3.5**	**$252**			
																		kWh Savings		**13,200**	**$1,735**			
																		Total Savings			**$1,987**		**2.6**	**2.1**

APPENDIX D

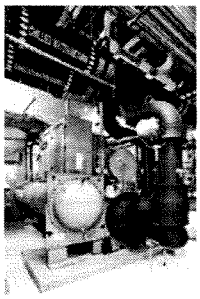
New Jersey Pay For Performance Incentive Program

Pay for Performance - Existing Buildings

Download program applications and incentive forms.

The Greater the Savings, the Greater Your Incentives

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



Eligibility

Existing commercial, industrial and institutional buildings with a peak demand over 100 kW for any of the preceding twelve months are eligible to participate including hotels and casinos, large office buildings, multi-family buildings, supermarkets, manufacturing facilities, schools, shopping malls and restaurants. Buildings that fall into the following five customer classes are not required to meet the 100 kW demand in order to participate in the program: hospitals, public colleges and universities, 501(c)(3) non-profits, affordable multifamily housing, and local governmental entities. Your energy reduction plan must define a comprehensive package of measures capable of reducing the existing energy consumption of your building by 15% or more.

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

ENERGY STAR Portfolio Manager

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

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

Incentives

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

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

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

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

CONTACT US

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

Energy Efficiency Revolving Loan Fund (EE RLF)

New Jersey-based commercial, institutional or industrial entities (including 501(c)(3) organizations) that have received an approved energy reduction plan under Pay for Performance may be eligible for supplemental financing through the EE RLF. The financing, in the form of low-interest loans, can be used to support up to 80% of total eligible project costs, not to exceed $2.5 million or 100% of total eligible project costs from all public state funding sources. Visit the NJ EDA website for details.

Steps to Participation

Click here for a step-by-step description of the program.

New Jersey's Clean Energy PROGRAM
Your Power to Save
njcleanenergy.com

New Jersey SmartStart BUILDINGS®

BPU

2012 PAY FOR PERFORMANCE PROGRAM
Existing Buildings Incentive Structure

Incentive #1: Energy Reduction Plan

Incentive Amount: ..... $0.10 per sq ft
Minimum Incentive: $5,000
Maximum Incentive:: ..... $50,000 or 50% of facility annual energy cost (whichever is less)

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

Incentive #2: Installation of Recommended Measures

Minimum Performance Target: 15%

Electric Incentives

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

Gas Incentives

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

Incentive Cap: ..... 25% of total project cost

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

Incentive #3: Post-Construction Benchmarking Report

Minimum Performance Target: 15%

Electric Incentives

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

Gas Incentives

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

Incentive Cap: ..... 25% of total project cost

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

Camden County College Blackwood Campus- NJBPU
CHA Project #24364
Child Care Building

New Jersey Pay For Performance Incentive Program

Note: The following calculation is based on the New Jersey Pay For Performance Incentive Program per April, 2012.
Building must have a minimum average electric demand of 100 kW. This minimum is waived for buildings owned by local governements or non-profit organizations.
Values used in this calculation are for measures with a positive return on investment (ROI) only.

Total Building Area (Square Feet)	4,650
Is this audit funded by NJ BPU (Y/N)	Yes

Board of Public Utilites (BPU)

Incentive #1		
Audit is funded by NJ BPU	$0.10	$/sqft
	$0.05	

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	$1,806	$902
Existing Usage (from utility)	14,235	1,442
Proposed Savings	13,200	0
Existing Total MMBtus	193	
Proposed Savings MMBtus	45	
% Energy Reduction	**23.4%**	
Proposed Annual Savings	$1,700	

	Min (Savings = 15%)		Increase (Savings > 15%)		Max Incentive		Achieved Incentive	
	$/kWh	$/therm	$/kWh	$/therm	$/kWh	$/therm	$/kWh	$/therm
Incentive #2	$0.09	$0.90	$0.005	$0.05	$0.11	$1.25	$0.11	$1.25
Incentive #3	$0.09	$0.90	$0.005	$0.05	$0.11	$1.25	$0.11	$1.25

	Incentives $		
	Elec	Gas	Total
Incentive #1	$0	$0	$5,000
Incentive #2	$1,452	$0	$1,452
Incentive #3	$1,452	$0	$1,452
Total All Incentives	**$2,904**	**$0**	**$7,904**

Total Project Cost	$5,100

		Allowable Incentive
% Incentives #1 of Utility Cost*	184.6%	$1,354
% Incentives #2 of Project Cost**	28.5%	$1,452
% Incentives #3 of Project Cost**	28.5%	$1,452
Total Eligible Incentives***	**$4,258**	
Project Cost w/ Incentives	$842	

Project Payback (years)	
w/o Incentives	w/ Incentives
3.0	0.5

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

** Maximum allowable amount of Incentive #2 is 25% of total project cost.
Maximum allowable amount of Incentive #3 is 25% of total project cost.

*** Maximum allowable amount of Incentive #1 is $50,000 if not funded by NJ BPU, and $25,000 if it is.
Maximum allowable amount of Incentive #2 & #3 is $1 million per gas account and $1 million per electric account; maximum 2 million per project

APPENDIX E

Energy Savings Improvement Plan (ESIP)

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

- PROGRAMS
  - NJ SMARTSTART BUILDINGS
  - PAY FOR PERFORMANCE
  - COMBINED HEAT & POWER AND FUEL CELLS
  - LOCAL GOVERNMENT ENERGY AUDIT
  - LARGE ENERGY USERS PILOT
  - ENERGY SAVINGS IMPROVEMENT PLAN
  - DIRECT INSTALL
  - ENERGY BENCHMARKING
  - T-12 SCHOOLS LIGHTING INITIATIVE
  - OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS
  - EDA PROGRAMS
  - TEACH
  - ARRA
- TECHNOLOGIES
- TOOLS AND RESOURCES
- PROGRAM UPDATES
- CONTACT US

Home » Commercial & Industrial » Programs

Energy Savings Improvement Plan

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

This Local Finance Notice outlines how local governments can develop and implement an ESIP for their facilities. Below are two sample RFPs:

- Local Government
- School Districts (K-12)

The Board also adopted protocols to measure energy savings.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Local units should carefully consider all alternatives to develop an approach that best meets their needs. Local units considering an ESIP should carefully review the Local Finance Notice, the law, and consult with qualified professionals to determine how they should approach the task.

FIRST STEP – ENERGY AUDIT

For local governments interested in pursuing an ESIP, the first step is to perform an energy audit. As explained in the Local Finance Notice, this may be done internally if an agency has qualified staff to conduct the audit. If not, the audit must be implemented by an independent contractor and not by the energy savings company producing the Energy Reduction Plan.

Pursuing a Local Government Energy Audit through New Jersey's Clean Energy Program is a valuable first step to the ESIP approach - and it's free. **Incentives provide 100% of the cost of the audit.**

ENERGY REDUCTION PLANS

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

- Frankford Township School District
- Northern Hunterdon-Voorhees Regional High School
- Manalapan Township ***(180 MB** - Right Click, Save As)*

Program Updates

- Board Order - Standby Charges for Distributed Generation Customers
- T-12 Schools Lighting Replacement Initiative - Funding Allocation Reached

Other updates posted.

APPENDIX F

Solar Photovoltaic Analysis

Camden County College
Child Care Center

Cost of Electricity	$0.127	/kWh
Electricity Usage	14,235	kWh/yr
System Unit Cost	$4,000	/kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
$	kW	kWh	therms	$	$	$	$	$	Years	Years
$40,000	**10.0**	**12,778**	**0**	**$1,623**	**0**	**$1,623**	**$0**	**$1,022**	**24.6**	**15.1**

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= $80 /1000kwh

Area Output*

370 m2
3,987 ft2

Perimeter Output*

57 m
185 ft

Available Roof Space for PV:
(Area Output - 10 ft x Perimeter) x 85%
1,813 ft2

Approximate System Size: Is the roof flat? (Yes/No) Yes

8	watt/ft2	
14,506	DC watts	
10	kW	Enter into PV Watts

PV Watts Inputs*

Array Tilt Angle	20	Enter into PV Watts (always 20 if flat, if pitched - enter estimated roof angle)
Array Azimuth	180	Enter into PV Watts (default)
Zip Code	08012	Enter into PV Watts
DC/AC Derate Factor	0.83	Enter info PV Watts

PV Watts Output

12,778 annual kWh calculated in PV Watts program

% Offset Calc

Usage	14,235	(from utilities)
PV Generation	12,778	(generated using PV Watts)
% offset	90%	

* http://www.freemaptools.com/area-calculator.htm
**http://www.flettexchange.com

AC Energy & Cost Savings

Cautions for Interpreting the Results

Child Care Building (Camden County College)

Station Identification

Cell ID:	0267373
State:	New Jersey
Latitude:	39.8 ° N
Longitude:	74.8 ° W

PV System Specifications

DC Rating:	10.0 kW
DC to AC Derate Factor:	0.830
AC Rating:	8.30 kW
Array Type:	Fixed Tilt
Array Tilt:	20.0 °
Array Azimuth:	180.0 °

Energy Specifications

Cost of Electricity:	13.1 ¢/kWh

Results

Month	Solar Radiation (kWh/m²/day)	AC Energy (kWh)	Energy Value ($)
1	2.71	701	91.83
2	3.50	825	108.08
3	4.81	1209	158.38
4	5.27	1250	163.75
5	5.81	1388	181.83
6	6.13	1372	179.73
7	5.76	1320	172.92
8	5.63	1285	168.34
9	5.03	1136	148.82
10	4.04	978	128.12
11	2.90	697	91.31
12	2.46	617	80.83
Year	4.51	12778	1673.92

Output Hourly Performance Data

(Gridded data is monthly, hourly output not available.)

Output Results as Text

Saving Text from a Browser

Run PVWATTS v.2 for another location

Run PVWATTS v.1

Please send questions and comments to Webmaster

Disclaimer and copyright notice.

RReDC home page (http://rredc.nrel.gov)

APPENDIX G

EPA Portfolio Manager

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Child Care Center

Building ID: 3251482
For 12-month Period Ending: April 30, 2012[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: November 08, 2012

Facility
Child Care Center
College Drive
Blackwood, NJ 08012

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1969
Gross Floor Area (ft²): 4,649

Energy Performance Rating[2] (1-100) N/A

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	52,664
Natural Gas (kBtu)[4]	153,489
Total Energy (kBtu)	206,153

Energy Intensity[4]

Site (kBtu/ft²/yr)	44
Source (kBtu/ft²/yr)	72

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	16

Electric Distribution Utility
Atlantic City Electric Co [Pepco Holdings Inc]

National Median Comparison

National Median Site EUI	70
National Median Source EUI	127
% Difference from National Median Source EUI	-43%
Building Type	Other

Stamp of Certifying Professional

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

Certifying Professional
N/A

Meets Industry Standards[5] **for Indoor Environmental Conditions:**

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

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

ENERGY STAR® Data Checklist for Commercial Buildings

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

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.
NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Child Care Center	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	College Drive, Blackwood, NJ 08012	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of a hospital, k-12 school, hotel and senior care facility) nor can they be submitted as representing only a portion of a building.		☐
Building (Other)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	4,649 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	N/A(Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	N/A(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	N/A(Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co [Pepco Holdings Inc]

Fuel Type: Electricity

Meter: Electricity (kWh (thousand Watt-hours))
Space(s): Entire Facility
Generation Method: Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
03/26/2012	04/25/2012	1,104.00
02/26/2012	03/25/2012	1,382.00
01/26/2012	02/25/2012	1,430.00
12/26/2011	01/25/2012	1,469.00
11/26/2011	12/25/2011	1,788.00
10/26/2011	11/25/2011	1,412.00
09/26/2011	10/25/2011	1,377.00
08/26/2011	09/25/2011	1,389.00
07/26/2011	08/25/2011	1,090.00
06/26/2011	07/25/2011	683.00
05/26/2011	06/25/2011	1,111.00
Electricity Consumption (kWh (thousand Watt-hours))		**14,235.00**
Electricity Consumption (kBtu (thousand Btu))		**48,569.82**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**48,569.82**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas

Meter: Gas (therms)
Space(s): Entire Facility

Start Date	End Date	Energy Use (therms)
03/24/2012	04/23/2012	101.97
02/24/2012	03/23/2012	165.83
01/24/2012	02/23/2012	394.61
12/24/2011	01/23/2012	467.50
11/24/2011	12/23/2011	236.31
10/24/2011	11/23/2011	73.06
09/24/2011	10/23/2011	0.00
08/24/2011	09/23/2011	3.10
07/24/2011	08/23/2011	0.00
06/24/2011	07/23/2011	0.00
05/24/2011	06/23/2011	0.00

Gas Consumption (therms)	**1,442.38**
Gas Consumption (kBtu (thousand Btu))	**144,238.00**
Total Natural Gas Consumption (kBtu (thousand Btu))	**144,238.00**
Is this the total Natural Gas consumption at this building including all Natural Gas meters?	☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

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

Certifying Professional

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

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

Facility
Child Care Center
College Drive
Blackwood, NJ 08012

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Child Care Center	
Gross Floor Area Excluding Parking: (ft^2)	4,649
Year Built	1969
For 12-month Evaluation Period Ending Date:	April 30, 2012

Facility Space Use Summary

Building	
Space Type	Other - Other
Gross Floor Area (ft^2)	4,649
Number of PCs °	N/A
Weekly operating hours °	N/A
Workers on Main Shift °	N/A

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 04/30/2012)	**Baseline** (Ending Date 04/30/2012)	**Rating of 75**	**Target**	**National Median**
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft²)	44	44	0	N/A	70
Source (kBtu/ft²)	72	72	0	N/A	127
Energy Cost					
$/year	$ 2,739.95	$ 2,739.95	N/A	N/A	$ 4,325.59
$/ft²/year	$ 0.59	$ 0.59	N/A	N/A	$ 0.93
Greenhouse Gas Emissions					
$MtCO_2e$/year	16	16	0	N/A	25
$kgCO_2e/ft^2$/year	3	3	0	N/A	5

More than 50% of your building is defined as Other. This building is currently ineligible for a rating. Please note the National Median column represents the CBECS national median data for Other. This building uses 43% less energy per square foot than the CBECS national median for Other.

Notes:
o - This attribute is optional.
d - A default value has been supplied by Portfolio Manager.