



FINAL Energy Audit Report

Prepared For:

Cumberland County College

Mr. Brian J. Ewan
Director of Facilities
3322 College Dr.
Vineland, NJ 08360

Prepared By:

Dome-Tech, Inc.

Prepared Under the
Guidelines of the State of NJ
Local Government Energy
Audit Program

October 2013



Dome-Tech, Inc.

510 Thornall Street, Suite 170
Edison, NJ 08837
Phone: 732-590-0122
Fax: 732-590-0129



(Page left blank intentionally)

CUMBERLAND COUNTY COLLEGE
LGEA REPORT

TABLE OF CONTENTS

1. Executive Summary
2. ECM Summary By Payback
3. Energy Audit Report
 - Energy Audit Purpose & Scope
 - Historic Energy Consumption
 - Facility Description
 - Greenhouse Gas Emissions Reduction
 - Energy Conservation Measures
 - Operational and Maintenance Issues
 - Renewable/Distributed Energy Measures
 - Solar Photo Voltaic System
 - Renewable Energy Technology Procurement
 - Utility Information
 - Retail Energy Purchasing
 - Historical Energy Prices
 - Potential Project Funding Sources
 - Next Steps
4. Appendix
 - Portfolio Manager/Energy Star
 - Equipment & Lighting Inventory Lists
 - ECM Lists
 - ECM Costs & Calculations
 - Renewables Calculations

(Page left blank intentionally)

October 22nd, 2013

Mr. Brian Ewan
Director, Facilities and Grounds
Cumberland County College
3322 College Dr.
Vineland, NJ 08362

**Re: EXECUTIVE SUMMARY FOR CUMBERLAND COUNTY COLLEGE (8 BUILDINGS)
STATE OF NEW JERSEY LOCAL GOVERNMENT ENERGY AUDIT – DRAFT REPORT
OUR PROJECT NUMBER D13171**

Dear Mr. Ewan:

Dome-Tech was retained by the Cumberland County College, as a pre-qualified participant in the Local Government Energy Audit Program, to perform an energy audit. The objectives of the energy audit were to evaluate the College's energy consumption, establish baselines for energy efficiency, and identify opportunities to reduce the amount of energy used and/or its cost.

The scope of the audit is standardized under the Program, and consisted of the following:

- Benchmarking historic energy consumption utilizing EPA Energy Star's Portfolio Manager
- Characterizing building use, occupancy, size, and construction
- Providing a detailed equipment list including estimated service life and efficiency
- Identifying and quantifying Energy Conservation Measures (ECMs)
- Evaluating the economic viability of various renewable/distributed energy technologies
- Performing a utility tariff analysis and assessing savings potential from energy procurement strategies
- Providing the method of analyses

Based upon data received for the twelve (12) month period June 2012 – May 2013, the facilities included in this study had an annual expenditure of:

- Electricity: approximately 3,796,000 kWh at a total cost of approximately \$499,500
- Natural Gas: approximately 166,000 therms at a total cost of approximately \$162,750

The following buildings were evaluated under this study:

Facility Name	Total Floor Area SF
Administration	9,202
Academic Building	47,818
Luciano Conference Center	23,212
University Center	17,499
Library/Distance Learning Center	17,591
Student Services Building (Except Gym)	29,326
Wheaton/Navone Healthcare	16,166
Service Building	10,898

Please refer to Section 2 of this report for a detailed list of identified Energy Conservation Measures (ECMs), along with a summary of their preliminary economics (estimated project cost, estimated annual energy savings, applicable rebate(s), etc.). In this report, all identified ECMs are ranked and presented according to their simple payback; however, please note that the Master ECM Table can also be sorted by building, by measure type, etc.

If all identified ECMs were to be implemented, they would provide the following estimated benefits to the Cumberland County College:

- Total annual electrical savings: Approximately 464,112 kilowatt-hours of electric Consumption; 12% of baseline
- Total annual natural gas savings: Approximately 63,414 Therms of natural gas consumption 38% of baseline
- Total annual cost savings: approximately \$116,551 of utility cost; 17.6% of baseline
- Total annual CO₂ emissions reduction: 526 tons
- Total net estimated implementation cost: approximately \$1,541,800
- Total average simple payback: 13.2 years

A summary of the projects that are recommended for implementation includes the following: Upgrading building controls, vending machine and personal computer "plug load" control, lighting upgrades, central chiller plant optimization and several other HVAC system upgrades.

Distributed/Renewable Energy Systems were also reviewed with the following conclusions:

- Dome-Tech considered two (2) different sizes of traditional ground-mounted wind turbine technologies. Due to low average wind speed and high investment costs, wind energy is not a viable investment option to implement at this time.
- Roof-mounted photovoltaic systems ranging in size from 35 kW dc roof mounted systems to 386 kW dc parking lot canopy systems (866 kW dc total) could provide approximately 4% to 100% of each building's annual energy usage (30% of total energy usage for the 8 buildings). In spite of the relatively low utility costs and low current REC (Renewable Energy Credit) prices, solar energy appears to be a viable investment option for this College Campus. The College may consider engaging in a PPA (Power Purchase Agreement) with a solar energy developer in order to reduce investment risks and operational burdens. Should the College decide to pursue a solar PPA, Dome-Tech recommends commissioning a more detailed study and market analysis.
- CHP (Combined Heat and Power), Fuel Cells, and Microturbines were also considered. A 260 kW Microturbine system is recommended for the facility, which will avoid purchase of approximately 1,665,000 kWh of electricity and offset the total consumption of the 8 buildings by 43%. Based on current average utility costs, campus energy consumption profile and currently available incentives, CHP proves to be a viable investment option for the college. Dome-Tech recommends commissioning an investment grade analysis in order to further evaluate the feasibility of installing a CHP system at the campus.

The College's data was entered into the US EPA *ENERGY STAR's Portfolio Manager* Database program. Buildings with scores of 75 or higher may qualify for the *ENERGY STAR* Building Label. Since the buildings are not metered individually, an Energy Star Score is not available for the 8 buildings included in this Audit.



Regarding the procurement of utilities, Dome-Tech understands that the College's facilities in this study are served by two (2) common electric accounts behind Atlantic City Electricity and Vineland Municipal Utilities and four (4) natural gas accounts behind New Jersey Gas Company. All major electricity and natural gas accounts were served by HESS, a third-party retail energy supplier, during the period analyzed in the study. However, the third party supplier contract for electricity has recently expired and has not been renewed. The county has recently opened bids for a new contract.

During the development of this audit, Dome-Tech was assisted by facility personnel, who were both knowledgeable and very helpful to our efforts. We would like to acknowledge and thank those individuals especially Mr. Wilbert Pfannerer.

Sincerely,

Ersin Gercek, PE, CEM, LEED AP, CPMP
Senior Energy Engineer



CUMBERLAND COUNTY COLLEGE

ECMs - SORTED BY PAYBACK

ECM #	Energy Conservation Measures (ECM)	Buildings	Energy Savings kWh	Energy Savings Therms	Gross Installation Cost*	Rebates/ Incentives	Avoided Cost	Net Implementation Costs	Annual Energy Cost Savings	Annual Oper. Cost Savings	Total Annual Cost Savings	Simple Payback	Internal Rate of Return (IRR) (Net)	Measure Life Yrs	Lifecycle Savings (NPV)	CO2 Savings Tons
1	Vending Machine Power Management	Student Center	3,868	0	\$1,156	\$0	\$0	\$1,156	\$509	\$0	\$509	2.3	43%	10	\$2,973	1.3
1	Vending Machine Power Management	University Center	1,934	0	\$578	\$0	\$0	\$578	\$255	\$0	\$255	2.3	43%	10	\$1,487	0.6
1	Vending Machine Power Management	Academic Building	3,868	0	\$1,156	\$0	\$0	\$1,156	\$509	\$0	\$509	2.3	43%	10	\$2,973	1.3
1	Vending Machine Power Management	Administration Building	1,934	0	\$578	\$0	\$0	\$578	\$255	\$0	\$255	2.3	43%	10	\$1,487	0.6
1	Vending Machine Power Management	Navone Building	1,934	0	\$578	\$0	\$0	\$578	\$255	\$0	\$255	2.3	43%	10	\$1,487	0.6
2	Domestic Water Heater Timers	Library	694	0	\$300	\$0	\$0	\$300	\$91	\$0	\$91	3.3	30%	15	\$715	0.2
2	Domestic Water Heater Timers	Conference Center	112	50	\$300	\$0	\$0	\$300	\$62	\$0	\$62	4.9	19%	15	\$387	0.3
2	Domestic Water Heater Timers	Service Building	112	50	\$300	\$0	\$0	\$300	\$62	\$0	\$62	4.9	19%	15	\$387	0.3
2	Domestic Water Heater Timers	Administration Building	112	20	\$300	\$0	\$0	\$300	\$34	\$0	\$34	8.9	7%	15	\$73	0.2
2	Domestic Water Heater Timers	Academic Building	403	0	\$600	\$0	\$0	\$600	\$53	\$0	\$53	11.3	4%	15	(\$11)	0.1
3	Computer Power Management System	Navone Healthcare Center	2,100	0	\$1,800	\$0	\$0	\$1,800	\$276	\$0	\$276	6.5	9%	10	\$442	0.7
3	Computer Power Management System	Service Building	245	0	\$210	\$0	\$0	\$210	\$32	\$0	\$32	6.5	9%	10	\$52	0.1
3	Computer Power Management System	Student Center	3,360	0	\$2,880	\$0	\$0	\$2,880	\$442	\$0	\$442	6.5	9%	10	\$706	1.1
3	Computer Power Management System	University Center	945	0	\$810	\$0	\$0	\$810	\$124	\$0	\$124	6.5	9%	10	\$199	0.3
3	Computer Power Management System	Academic Building	11,200	0	\$9,600	\$0	\$0	\$9,600	\$1,474	\$0	\$1,474	6.5	9%	10	\$2,355	3.7
3	Computer Power Management System	Administration Building	1,190	0	\$1,020	\$0	\$0	\$1,020	\$157	\$0	\$157	6.5	9%	10	\$250	0.4
3	Computer Power Management System	Conference Center	945	0	\$810	\$0	\$0	\$810	\$124	\$0	\$124	6.5	9%	10	\$199	0.3
3	Computer Power Management System	Library	4,130	0	\$3,540	\$0	\$0	\$3,540	\$544	\$0	\$544	6.5	9%	10	\$868	1.4
4	Lighting Equipment and Controls Upgrade	Service Building	10,504	0	\$5,461	\$435	\$0	\$5,026	\$1,438	\$0	\$1,438	3.5	28%	15	\$10,966	3.5
4	Lighting Equipment and Controls Upgrade	Conference Center	9,627	0	\$8,368	\$935	\$0	\$7,433	\$1,191	\$0	\$1,191	6.2	14%	15	\$5,812	3.2
4	Lighting Equipment and Controls Upgrade	Library	21,245	0	\$20,032	\$3,375	\$0	\$16,657	\$2,629	\$0	\$2,629	6.3	13%	15	\$12,572	7.1
4	Lighting Equipment and Controls Upgrade	Academic Building	39,658	0	\$44,899	\$7,775	\$0	\$37,124	\$4,907	\$0	\$4,907	7.6	10%	15	\$17,439	13.2
4	Lighting Equipment and Controls Upgrade	Student Center	24,154	0	\$28,410	\$4,045	\$0	\$24,365	\$3,308	\$0	\$3,308	7.4	11%	15	\$12,410	8.0
4	Lighting Equipment and Controls Upgrade	Administration Building	12,021	0	\$14,080	\$2,385	\$0	\$11,695	\$1,646	\$0	\$1,646	7.1	11%	15	\$6,607	4.0
4	Lighting Equipment and Controls Upgrade	Navone Healthcare Center	14,356	0	\$18,247	\$1,650	\$0	\$16,597	\$1,966	\$0	\$1,966	8.4	8%	15	\$5,260	4.8
4	Lighting Equipment and Controls Upgrade	University Center	12,354	0	\$19,382	\$2,970	\$0	\$16,412	\$1,529	\$0	\$1,529	10.7	5%	15	\$586	4.1
5	Chiller Plant Optimization	Service Building	221,751	0	\$223,116	\$0	\$0	\$223,116	\$29,182	\$0	\$29,182	7.6	10%	15	\$101,345	73.8
6	Rooftop Unit Fuel Switch	Administration Building	32,724	-1,489	\$28,400	\$460	\$0	\$27,940	\$2,895	\$0	\$2,895	9.7	6%	15	\$4,249	2.2
7	Daylight Harvesting	Conference Center	2,451	0	\$4,000	\$0	\$0	\$4,000	\$323	\$0	\$323	12.4	-4%	10	(\$1,383)	0.8
7	Daylight Harvesting	University Center	2,039	0	\$3,000	\$0	\$0	\$3,000	\$268	\$0	\$268	11.2	-2%	10	(\$824)	0.7
8	Premium Efficiency Electric Motors	Administration Building	2,310	0	\$4,016	\$115	\$0	\$3,901	\$304	\$0	\$304	12.8	2%	15	(\$521)	0.8
8	Premium Efficiency Electric Motors	Library	955	0	\$2,181	\$90	\$0	\$2,091	\$126	\$0	\$126	16.6	-1%	15	(\$694)	0.3
9	Variable Frequency Drives and 2-way Valves	University Center	9,289	0	\$13,183	\$108	\$0	\$13,075	\$1,222	\$0	\$1,222	10.7	5%	15	\$517	3.1
9	Variable Frequency Drives and 2-way Valves	Library	9,289	0	\$13,608	\$0	\$0	\$13,608	\$1,222	\$0	\$1,222	11.1	4%	15	(\$16)	3.1
9	Variable Frequency Drives and 2-way Valves	Academic Building	10,048	0	\$15,492	\$108	\$0	\$15,384	\$1,322	\$0	\$1,322	11.6	3%	15	(\$681)	3.3
9	Variable Frequency Drives and 2-way Valves	Student Center	42,506	0	\$82,809	\$388	\$0	\$82,421	\$5,594	\$0	\$5,594	14.7	0%	15	(\$20,227)	14.2
9	Variable Frequency Drives and 2-way Valves	Conference Center	29,263	0	\$62,191	\$342	\$0	\$61,849	\$3,851	\$0	\$3,851	16.1	-1%	15	(\$19,033)	9.7
9	Variable Frequency Drives and 2-way Valves	Navone Building	16,515	0	\$44,634	\$216	\$0	\$44,418	\$2,173	\$0	\$2,173	20.4	-4%	15	(\$20,253)	5.5
10	Demand Controlled Kitchen Ventilation	Student Center	9,642	658	\$33,500	\$0	\$0	\$33,500	\$1,893	\$0	\$1,893	17.7	-2%	15	(\$12,454)	7.1
11	Boiler Replacement	Service Building	0	24,549	\$450,000	\$9,000	\$0	\$441,000	\$23,270	\$0	\$23,270	19.0	3%	30	(\$38,613)	143.7
12	Heat Recovery Chiller Installation	Service Building	-165,223	39,762	\$250,000	\$0	\$0	\$250,000	\$11,785	\$0	\$11,785	21.2	1%	25	(\$65,897)	177.7
13	AC Unit Upgrades	Service Building	36,954	-2,233	\$27,744	\$368	\$0	\$27,376	\$2,746	\$0	\$2,746	10.0	6%	15	\$3,157	-0.8
13	AC Unit Upgrades	Administration Building	4,117	1,241	\$49,536	\$1,657	\$0	\$47,879	\$1,718	\$0	\$1,718	27.9	-7%	15	(\$28,779)	8.6
13	AC Unit Upgrades	Academic Bld (Comp. Tech Lb)	15,038	0	\$65,680	\$548	\$0	\$65,133	\$1,979	\$0	\$1,979	32.9	-9%	15	(\$43,130)	5.0
14	Domestic Water Heater Replacement	Service Building	112	343	\$7,800	\$50	\$0	\$7,750	\$343	\$0	\$343	22.6	-5%	15	(\$3,937)	2.0
14	Domestic Water Heater Replacement	Academic Building	515	463	\$12,600	\$50	\$0	\$12,550	\$463	\$0	\$463	27.1	-7%	15	(\$7,403)	2.9
Total			464,112	63,414	\$1,578,885	\$37,069	\$0	\$1,541,815	\$116,551	\$0	\$116,551	13.2	-	-	(\$65,898)	526

Notes:

1. KW - Where Zero (0) values are shown in the table there is no demand reduction for this measure.
2. Rebates- Where Zero (0) values are shown in the table we could not find any rebates of other financial incentives that are currently available for this measure.
3. Gross Installation Cost is the cost of installing equipment recommended by the ECM.
4. Avoided Cost is the cost of replacing equipment at end of service life with like and kind equipment.
5. Net Implementaion Cost is the Gross Installation Cost less any Rebate/Incentive and any Avoided Cost. In the case of equipment that is being replaced regardless, Net Implementation Cost represents the incremental cost incurred by upgrading to equipment that produces more energy savings.
6. Intrest Rate is set to 4% for NPV calculations

(Page left blank intentionally)



Table of Contents

Energy Audit Purpose & Scope	2
Historic Energy Consumption	3-15
Energy Star Portfolio Manager	16-17
Facility Information	18-33
Greenhouse Gas Emission Reduction	34
Energy Conservation Measures (ECM's)	35-56
Operational & Maintenance Issues	57-59
Renewable/Distributed Energy Measures	60
Renewable Energy Technologies:	
Wind.....	61-63
Solar Photovoltaic	64-66
CHP/Cogeneration	67-68
Retail Energy Purchasing: Recommendations	69-70
Utility Tariff and Rate Review:	
Electricity	71
Natural Gas	72
Utility Deregulation in NJ	73-75
Historical Energy Futures Settlement Prices	76
Potential Project Funding Sources	77-78
Next Steps	79



Energy Audit Purpose & Scope

Purpose:

- The objectives of the energy audit are to evaluate each site's energy consumption, establish baselines for energy efficiency and identify opportunities to reduce the amount of energy used and/or its cost.

Scope:

- I. Historic Energy Consumption: Benchmark energy use using Energy Star Portfolio Manager
- II. Facility Description: Characterize building usage, occupancy, size and construction.
- III. Equipment Inventory: Detailed equipment list including useful life and efficiency.
- IV. Energy Conservation Measures: Identify and evaluate opportunities for cost savings and economic returns.
- V. Renewable/Distributed Energy Measures: Evaluate economic viability of various renewable/distributed energy technologies.
- VI. Energy Purchasing and Procurement Strategies: Perform utility tariff analysis and assess potential for savings from energy procurement strategies.
- VII. Method of Analysis: Appendices

Historic Energy Consumption

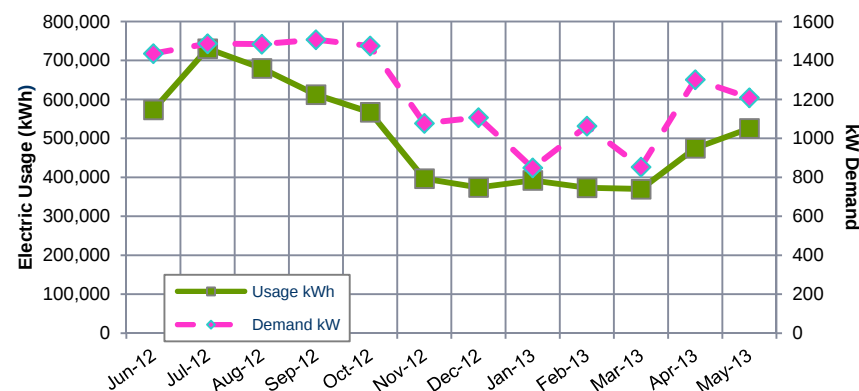
Utility Usage and Cost Summary

Entire Campus – Electric

- The College has two main electric services provided by two separate utility companies. Each service is connected to a single electric meter and then distributed to a set of buildings.
- The below table summarizes the total utility consumption of the entire campus.
- Individual building usage is calculated using the building area as compared to the entire campus.

Time-period: Jun. 2012 – May 2013

Campus Total Energy Usage



Facility Name: Cumberland County College				Utility Companies: Vineland Municipal Utilities Atlantic City Electric Company							Delivery	Supply
Account Number 0115-8349-9972, 7053-31616												
Meter Number 86422420, E31492												
Energy Type	Energy Unit	Month	Demand kW	Usage kWh	Delivery Cost	Supplier Cost	Total Cost	\$/kWh	\$/kWh	\$/kWh		
Electricity	kWh	Jun-12	1435	573,263	\$25,349	\$49,387	\$74,736	\$0.130	\$0.044	\$0.086		
Electricity	kWh	Jul-12	1486	730,358	\$33,623	\$62,609	\$96,232	\$0.132	\$0.046	\$0.086		
Electricity	kWh	Aug-12	1484	679,862	\$31,223	\$58,610	\$89,833	\$0.132	\$0.046	\$0.086		
Electricity	kWh	Sep-12	1507	612,425	\$27,709	\$51,642	\$79,351	\$0.130	\$0.045	\$0.084		
Electricity	kWh	Oct-12	1474	567,116	\$26,417	\$46,866	\$73,283	\$0.129	\$0.047	\$0.083		
Electricity	kWh	Nov-12	1077	396,616	\$19,867	\$33,155	\$53,021	\$0.134	\$0.050	\$0.084		
Electricity	kWh	Dec-12	1107	374,212	\$18,898	\$31,098	\$49,996	\$0.134	\$0.051	\$0.083		
Electricity	kWh	Jan-13	849	392,108	\$19,968	\$31,728	\$51,696	\$0.132	\$0.051	\$0.081		
Electricity	kWh	Feb-13	1063	373,292	\$18,908	\$31,157	\$50,065	\$0.134	\$0.051	\$0.083		
Electricity	kWh	Mar-13	853	369,703	\$18,700	\$30,433	\$49,133	\$0.133	\$0.051	\$0.082		
Electricity	kWh	Apr-13	1302	474,841	\$22,904	\$38,849	\$61,753	\$0.130	\$0.048	\$0.082		
Electricity	kWh	May-13	1209	525,712	\$24,568	\$45,052	\$69,620	\$0.132	\$0.047	\$0.086		
Totals / Average			1507	6,069,508	\$288,134	\$510,585	\$798,719	\$0.132	\$0.047	\$0.084		

* Electric Demand is calculated by simply adding the total demand from each bill and may not be accurate.



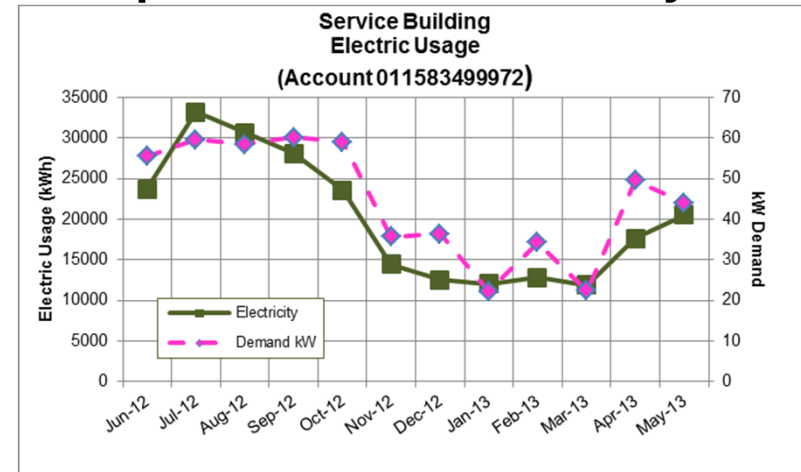
Historic Energy Consumption (cont'd)

Utility Usage and Cost Summary

Service Center – Electric

- Service Center houses the central chiller and boiler plant.
- Central plant supplies the entire campus with hot and chilled water for heating and air conditioning.
- Electricity usage of service center is calculated based on the ratio of the building area to the total campus area.

Time-period: Jun. 2012 – May 2013



Facility Name: Service Building											
Address: 3322 College Dr, Vineland, NJ 08360											
Account #: 0115-8349-9972 (Shared)											
Meter#: 86422420 (Shared)											
										Delivery	Supply
Energy Type	Energy Unit	Start Date	End Date	Demand kW	Usage kWh	Delivery Cost	Supplier Cost	Total Cost	\$/kWh	\$/kWh	\$/kWh
Electricity	kWh	5/28/2012	6/26/2012	55	23670	\$977	\$2,058	\$3,035	\$0.128	0.041	0.087
Electricity	kWh	6/27/2012	7/29/2012	59	33148	\$1,480	\$2,882	\$4,362	\$0.132	0.045	0.087
Electricity	kWh	7/30/2012	8/27/2012	58	30601	\$1,360	\$2,661	\$4,021	\$0.131	0.044	0.087
Electricity	kWh	8/28/2012	9/27/2012	60	28103	\$1,319	\$2,444	\$3,763	\$0.134	0.047	0.087
Electricity	kWh	9/28/2012	10/28/2012	59	23580	\$1,171	\$2,050	\$3,221	\$0.137	0.050	0.087
Electricity	kWh	10/29/2012	11/28/2012	36	14429	\$826	\$1,255	\$2,081	\$0.144	0.057	0.087
Electricity	kWh	11/29/2012	12/27/2012	36	12514	\$744	\$1,088	\$1,832	\$0.146	0.059	0.087
Electricity	kWh	12/28/2012	1/27/2013	22	12067	\$747	\$1,049	\$1,796	\$0.149	0.062	0.087
Electricity	kWh	1/28/2013	2/26/2013	34	12813	\$760	\$1,114	\$1,874	\$0.146	0.059	0.087
Electricity	kWh	2/27/2013	3/27/2013	22	11873	\$717	\$1,032	\$1,749	\$0.147	0.060	0.087
Electricity	kWh	3/28/2013	4/28/2013	50	17606	\$944	\$1,531	\$2,475	\$0.141	0.054	0.087
Electricity	kWh	4/29/2013	5/28/2013	44	20539	\$1,000	\$1,786	\$2,785	\$0.136	0.049	0.087
TOTAL / AVERAGE				60.1	240,944	\$12,044	\$20,950	\$32,994	\$0.137	0.050	0.087

Note: There are two electric meters for all of the buildings on the Cumberland County College campus. The usage of this building was estimated based on square footage compared to the total square footage of all building on the same meter.



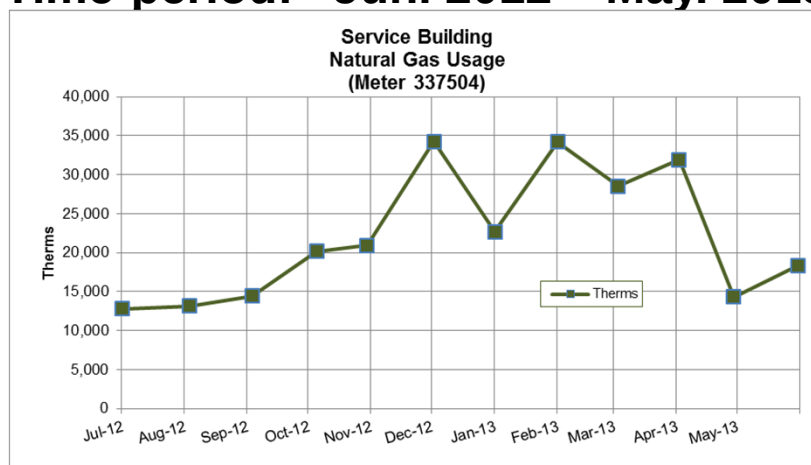
Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary

Service Center - Gas

- Service Center houses the central chiller and boiler plant.
- Central plant supplies the entire campus with hot and chilled water for heating and air conditioning.

Time-period: Jun. 2012 – May. 2013



Facility Name: Service Building
Address: 3322 College Dr,
Vineland, NJ 08360
Account #: 31018410006
Meter#: 337504

									Delivery	Supply
Energy Type	Energy Unit	Start Date	End Date	Therms	Delivery Cost	Supplier Cost	Total Cost	\$/Therm	\$/Therm	\$/Therm
Natural Gas	Therms	6/11/2012	7/11/2012	12,789	\$5,451	\$6,922	\$12,373	\$0.97	\$0.43	\$0.54
Natural Gas	Therms	7/11/2012	8/13/2012	13,138	\$5,675	\$7,111	\$12,786	\$0.97	\$0.43	\$0.54
Natural Gas	Therms	8/13/2012	9/13/2012	14,462	\$6,046	\$7,828	\$13,873	\$0.96	\$0.42	\$0.54
Natural Gas	Therms	9/13/2012	10/15/2012	20,186	\$8,243	\$10,926	\$19,169	\$0.95	\$0.41	\$0.54
Natural Gas	Therms	10/15/2012	11/9/2012	20,948	\$8,545	\$11,338	\$19,883	\$0.95	\$0.41	\$0.54
Natural Gas	Therms	11/9/2012	12/12/2012	34,270	\$13,654	\$18,548	\$32,202	\$0.94	\$0.40	\$0.54
Natural Gas	Therms	12/12/2012	1/11/2013	22,683	\$9,348	\$12,277	\$21,625	\$0.95	\$0.41	\$0.54
Natural Gas	Therms	1/11/2013	2/11/2013	34,209	\$13,367	\$18,515	\$31,882	\$0.93	\$0.39	\$0.54
Natural Gas	Therms	2/11/2013	3/13/2013	28,506	\$11,305	\$15,429	\$26,734	\$0.94	\$0.40	\$0.54
Natural Gas	Therms	3/13/2013	4/12/2013	31,948	\$12,523	\$17,279	\$29,802	\$0.93	\$0.39	\$0.54
Natural Gas	Therms	4/12/2013	5/9/2013	14,303	\$6,139	\$7,742	\$13,881	\$0.97	\$0.43	\$0.54
Natural Gas	Therms	5/9/2013	6/10/2013	18,371	\$7,810	\$9,943	\$17,753	\$0.97	\$0.43	\$0.54
Totals/Average				265,814	\$108,107	\$143,857	\$251,964	\$0.95	\$0.41	\$0.54

Note: The natural gas usage of this building was estimated based on square footage compared to the total square footage of all buildings on the campus hot water loop.



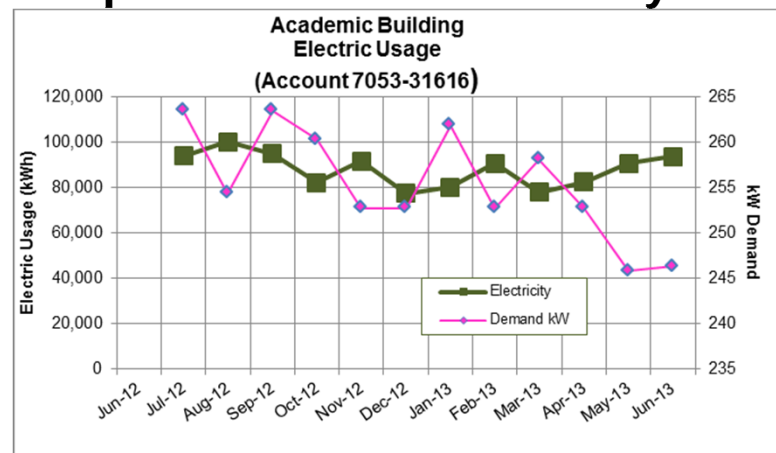
Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary

Academic Building – Electric

- The building is not separately metered. Therefore, electricity consumption is estimated based on building area.

Time-period: Jun. 2012 – May 2013



Facility Name: Academic Building
Address: 3322 College Dr,
Vineland, NJ 08360
Account #: 7053-31616 (Shared)
Meter#: E31492 (Shared)

										Delivery	Supply
Energy Type	Energy Unit	Start Date	End Date	Demand kW	Usage kWh	Delivery Cost	Supplier Cost	Total Cost	\$/kWh	\$/kWh	\$/kWh
Electricity	kWh	6/12/2012	7/12/2012	264	93,962	\$4,604	\$7,973	\$12,577	\$0.134	0.049	0.085
Electricity	kWh	7/12/2012	8/13/2012	254	100,416	\$4,920	\$8,346	\$13,266	\$0.132	0.049	0.083
Electricity	kWh	8/13/2012	9/12/2012	264	95,124	\$4,661	\$8,054	\$12,715	\$0.134	0.049	0.085
Electricity	kWh	9/12/2012	10/10/2012	260	82,217	\$3,412	\$6,457	\$9,869	\$0.120	0.042	0.079
Electricity	kWh	10/10/2012	11/12/2012	253	91,897	\$3,814	\$6,939	\$10,752	\$0.117	0.042	0.076
Electricity	kWh	11/12/2012	12/10/2012	253	77,571	\$3,219	\$6,172	\$9,391	\$0.121	0.042	0.080
Electricity	kWh	12/10/2012	1/11/2013	262	80,281	\$3,332	\$6,361	\$9,693	\$0.121	0.042	0.079
Electricity	kWh	1/11/2013	2/12/2013	253	90,865	\$3,771	\$6,883	\$10,654	\$0.117	0.042	0.076
Electricity	kWh	2/12/2013	3/11/2013	258	77,958	\$3,235	\$6,219	\$9,454	\$0.121	0.042	0.080
Electricity	kWh	3/11/2013	4/9/2013	253	82,475	\$3,423	\$6,434	\$9,857	\$0.120	0.042	0.078
Electricity	kWh	4/9/2013	5/9/2013	246	90,736	\$3,766	\$6,841	\$10,606	\$0.117	0.042	0.075
Electricity	kWh	5/9/2013	6/11/2013	246	93,704	\$4,123	\$7,864	\$11,987	\$0.128	0.044	0.084
TOTAL / AVERAGE				263.5	1,057,207	\$46,280	\$84,543	\$130,822	\$0.124	0.044	0.080

Note: There are two electric meters for all of the buildings on the Cumberland County College campus. The usage of this building was estimated based on square footage compared to the total square footage of all building on the same meter.



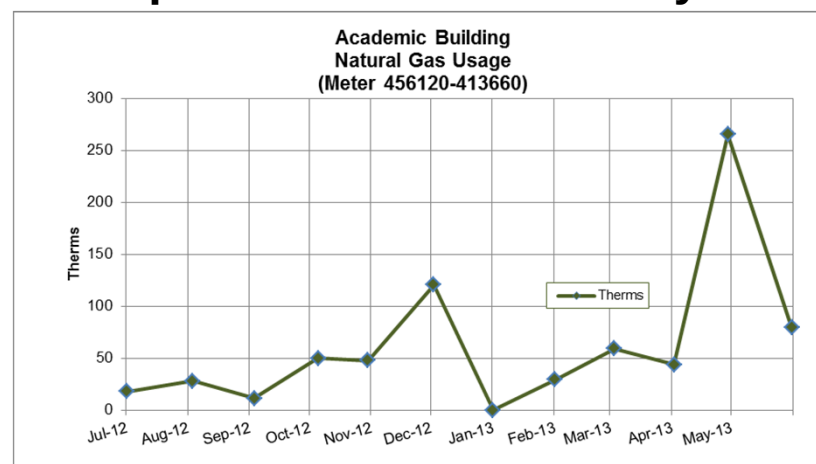
Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary

Academic Building – Gas

- A domestic hot water heater is connected to this meter.

Time-period: Jul. 2012 – May. 2013



Facility Name: Academic Building
Address: 3322 College Dr,
Vineland, NJ 08360
Account #: 31018410006
Meter#: 456120-413660

									Delivery	Supply
Energy Type	Energy Unit	Start Date	End Date	Therms	Delivery Cost	Supplier Cost	Total Cost	\$/Therm	\$/Therm	\$/Therm
Natural Gas	Therms	6/11/2012	7/11/2012	18	\$8	\$10	\$17	\$0.97	\$0.43	\$0.54
Natural Gas	Therms	7/11/2012	8/13/2012	28	\$12	\$15	\$27	\$0.97	\$0.43	\$0.54
Natural Gas	Therms	8/13/2012	9/13/2012	12	\$5	\$6	\$11	\$0.96	\$0.42	\$0.54
Natural Gas	Therms	9/13/2012	10/15/2012	50	\$20	\$27	\$47	\$0.95	\$0.41	\$0.54
Natural Gas	Therms	10/15/2012	11/9/2012	48	\$19	\$26	\$45	\$0.95	\$0.41	\$0.54
Natural Gas	Therms	11/9/2012	12/12/2012	121	\$48	\$65	\$113	\$0.94	\$0.40	\$0.54
Natural Gas	Therms	12/12/2012	1/11/2013	0	\$0	\$0	\$0	\$0.00	\$0.00	\$0.00
Natural Gas	Therms	1/11/2013	2/11/2013	29	\$11	\$16	\$27	\$0.93	\$0.39	\$0.54
Natural Gas	Therms	2/11/2013	3/13/2013	59	\$24	\$32	\$56	\$0.94	\$0.40	\$0.54
Natural Gas	Therms	3/13/2013	4/12/2013	44	\$17	\$24	\$41	\$0.93	\$0.39	\$0.54
Natural Gas	Therms	4/12/2013	5/9/2013	265	\$114	\$144	\$258	\$0.97	\$0.43	\$0.54
Natural Gas	Therms	5/9/2013	6/10/2013	79	\$34	\$43	\$77	\$0.97	\$0.43	\$0.54
Totals/Average				753	\$312	\$408	\$720	\$0.96	\$0.41	\$0.54



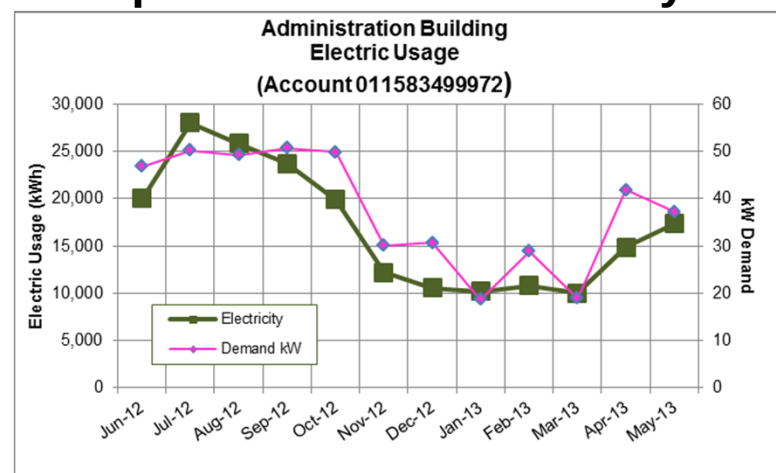
Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary

Administration Building - Electric

- The building is not separately metered. Therefore, electricity consumption is estimated based on building area.

Time-period: Jun. 2012 – May 2013



Facility Name: Administration Building
 Address: 3322 College Dr,
 Vineland, NJ 08360
 Account #: 0115-8349-9972 (Shared)
 Meter#: 86422420 (Shared)

										Delivery	Supply
Energy Type	Energy Unit	Start Date	End Date	Demand kW	Usage kWh	Delivery Cost	Supplier Cost	Total Cost	\$/kWh	\$/kWh	\$/kWh
Electricity	kWh	5/28/2012	6/26/2012	47	19,987	\$825	\$1,738	\$2,563	\$0.128	0.041	0.087
Electricity	kWh	6/26/2012	7/29/2012	50	27,990	\$1,250	\$2,434	\$3,683	\$0.132	0.045	0.087
Electricity	kWh	7/29/2012	8/27/2012	49	25,838	\$1,148	\$2,247	\$3,395	\$0.131	0.044	0.087
Electricity	kWh	8/27/2012	9/27/2012	51	23,730	\$1,114	\$2,063	\$3,177	\$0.134	0.047	0.087
Electricity	kWh	9/27/2012	10/28/2012	50	19,911	\$989	\$1,731	\$2,720	\$0.137	0.050	0.087
Electricity	kWh	10/28/2012	11/28/2012	30	12,183	\$698	\$1,059	\$1,757	\$0.144	0.057	0.087
Electricity	kWh	11/28/2012	12/27/2012	31	10,567	\$628	\$919	\$1,547	\$0.146	0.059	0.087
Electricity	kWh	12/27/2012	1/27/2013	19	10,189	\$631	\$886	\$1,517	\$0.149	0.062	0.087
Electricity	kWh	1/27/2013	2/26/2013	29	10,819	\$641	\$941	\$1,582	\$0.146	0.059	0.087
Electricity	kWh	2/26/2013	3/27/2013	19	10,025	\$605	\$872	\$1,477	\$0.147	0.060	0.087
Electricity	kWh	3/27/2013	4/28/2013	42	14,866	\$797	\$1,293	\$2,090	\$0.141	0.054	0.087
Electricity	kWh	4/28/2013	5/28/2013	37	17,342	\$844	\$1,508	\$2,352	\$0.136	0.049	0.087
TOTAL / AVERAGE				50.7	203,447	\$10,170	\$17,690	\$27,859	\$0.137	0.050	0.087

Note: There are two electric meters for all of the buildings on the Cumberland County College campus. The usage of this building was estimated based on square footage compared to the total square footage of all building on the same meter.



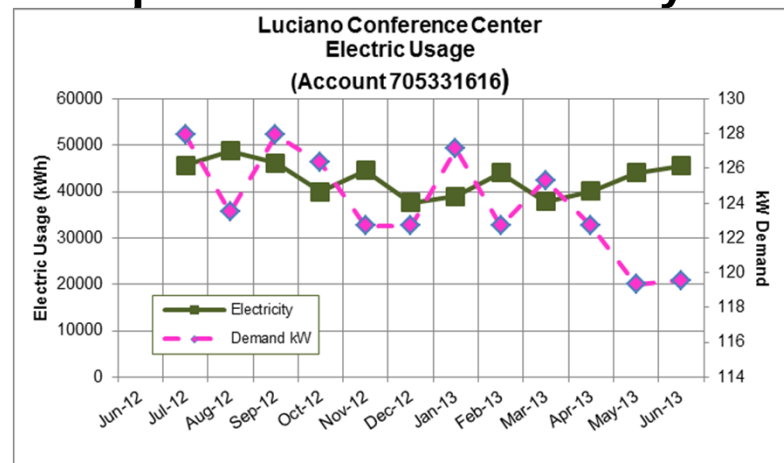
Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary

Luciano Conference Center - Electric

- The building is not separately metered. Therefore, electricity consumption is estimated based on building area.

Time-period: Jun. 2012 – May 2013



Facility Name: Luciano Conference Center

Address: 3322 College Dr,
Vineland, NJ 08360

Account #: 7053-31616 (Shared)

Meter#: E31492 (Shared)

										Delivery	Supply
Energy Type	Energy Unit	Start Date	End Date	Demand kW	Usage kWh	Delivery Cost	Supplier Cost	Total Cost	\$/kWh	\$/kWh	\$/kWh
Electricity	kWh	6/12/2012	7/12/2012	128	45612	\$2,235	\$3,870	\$6,105	\$0.13	0.049	0.085
Electricity	kWh	7/13/2012	8/13/2012	123	48744	\$2,388	\$4,051	\$6,440	\$0.13	0.049	0.083
Electricity	kWh	8/14/2012	9/12/2012	128	46175	\$2,263	\$3,910	\$6,172	\$0.13	0.049	0.085
Electricity	kWh	9/13/2012	10/10/2012	126	39910	\$1,656	\$3,134	\$4,791	\$0.12	0.042	0.079
Electricity	kWh	10/11/2012	11/12/2012	123	44609	\$1,851	\$3,368	\$5,219	\$0.12	0.042	0.076
Electricity	kWh	11/13/2012	12/10/2012	123	37655	\$1,563	\$2,996	\$4,559	\$0.12	0.042	0.080
Electricity	kWh	12/11/2012	1/11/2013	127	38970	\$1,617	\$3,088	\$4,705	\$0.12	0.042	0.079
Electricity	kWh	1/12/2013	2/12/2013	123	44108	\$1,830	\$3,341	\$5,172	\$0.12	0.042	0.076
Electricity	kWh	2/13/2013	3/11/2013	125	37843	\$1,570	\$3,019	\$4,589	\$0.12	0.042	0.080
Electricity	kWh	3/12/2013	4/9/2013	123	40035	\$1,661	\$3,123	\$4,785	\$0.12	0.042	0.078
Electricity	kWh	4/10/2013	5/9/2013	119	44045	\$1,828	\$3,321	\$5,148	\$0.12	0.042	0.075
Electricity	kWh	5/10/2013	6/11/2013	120	45486	\$2,001	\$3,817	\$5,819	\$0.13	0.044	0.084
TOTAL / AVERAGE				127.9	513,193	\$22,465	\$41,039	\$63,504	\$0.124	0.044	0.080

Note: There are two electric meters for all of the buildings on the Cumberland County College campus. The usage of this building was estimated based on square footage compared to the total square footage of all building on the same meter.



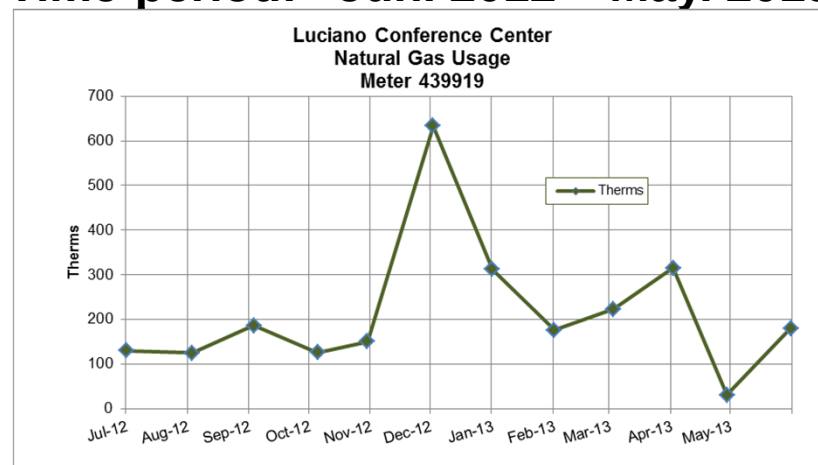
Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary

Luciano Conference Center - Gas

- Commercial kitchen equipment and domestic hot water heater are connected to this meter.

Time-period: Jun. 2012 – May. 2013



Facility Name: Luciano Conference Center
Address: 3322 College Dr,
Vineland, NJ 08360
Account #: 31020002700
Meter#: 439919

									Delivery	Supply
Energy Type	Energy Unit	Start Date	End Date	Therms	Delivery Cost	Supplier Cost	Total Cost	\$/Therm	\$/Therm	\$/Therm
Natural Gas	Therms	6/11/2012	7/11/2012	129	\$87	\$70	\$157	\$1.21	\$0.67	\$0.54
Natural Gas	Therms	7/11/2012	8/13/2012	124	\$87	\$67	\$154	\$1.24	\$0.70	\$0.54
Natural Gas	Therms	8/13/2012	9/13/2012	187	\$116	\$101	\$217	\$1.16	\$0.62	\$0.54
Natural Gas	Therms	9/13/2012	10/15/2012	126	\$92	\$68	\$160	\$1.27	\$0.73	\$0.54
Natural Gas	Therms	10/15/2012	11/9/2012	150	\$106	\$81	\$187	\$1.25	\$0.71	\$0.54
Natural Gas	Therms	11/9/2012	12/12/2012	633	\$389	\$343	\$732	\$1.16	\$0.61	\$0.54
Natural Gas	Therms	12/12/2012	1/11/2013	312	\$229	\$169	\$398	\$1.27	\$0.73	\$0.54
Natural Gas	Therms	1/11/2013	2/11/2013	176	\$125	\$95	\$220	\$1.25	\$0.71	\$0.54
Natural Gas	Therms	2/11/2013	3/13/2013	223	\$150	\$120	\$271	\$1.22	\$0.67	\$0.54
Natural Gas	Therms	3/13/2013	4/12/2013	315	\$202	\$170	\$373	\$1.18	\$0.64	\$0.54
Natural Gas	Therms	4/12/2013	5/9/2013	30	\$39	\$16	\$55	\$1.82	\$1.28	\$0.54
Natural Gas	Therms	5/9/2013	6/10/2013	180	\$127	\$97	\$225	\$1.25	\$0.71	\$0.54
Totals/Average				2,585	\$1,748	\$1,399	\$3,148	\$1.22	\$0.68	\$0.54



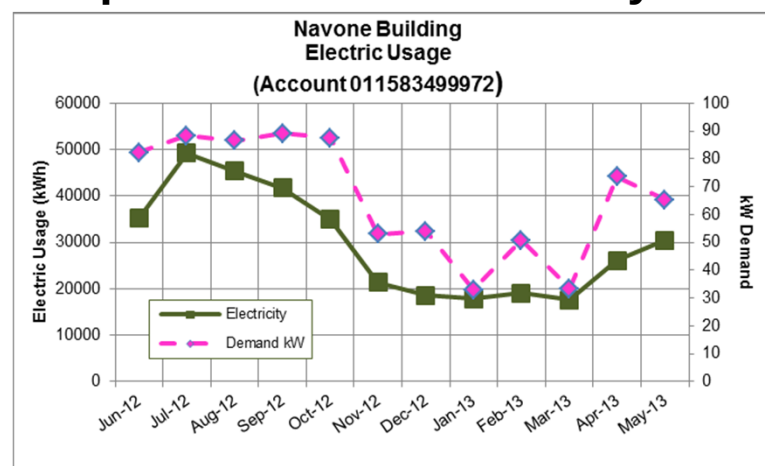
Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary

Wheaton/Navone Building - Electric

- The building is not separately metered. Therefore, electricity consumption is estimated based on building area.

Time-period: Jun. 2012 – May 2013



Facility Name: Navone Building										Delivery	Supply
Address: 3322 College Dr, Vineland, NJ 08360											
Account #: 0115-8349-9972 (Shared)											
Meter#: 86422420 (Shared)											
Energy Type	Energy Unit	Start Date	End Date	Demand kW	Usage kWh	Delivery Cost	Supplier Cost	Total Cost	\$/kWh	\$/kWh	\$/kWh
Electricity	kWh	5/28/2012	6/26/2012	82	35112	\$1,449	\$3,053	\$4,502	\$0.128	0.041	0.087
Electricity	kWh	6/27/2012	7/29/2012	88	49172	\$2,195	\$4,276	\$6,471	\$0.132	0.045	0.087
Electricity	kWh	7/30/2012	8/27/2012	87	45393	\$2,017	\$3,947	\$5,964	\$0.131	0.044	0.087
Electricity	kWh	8/28/2012	9/27/2012	89	41688	\$1,957	\$3,625	\$5,582	\$0.134	0.047	0.087
Electricity	kWh	9/28/2012	10/28/2012	87	34979	\$1,737	\$3,041	\$4,778	\$0.137	0.050	0.087
Electricity	kWh	10/29/2012	11/28/2012	53	21404	\$1,225	\$1,861	\$3,086	\$0.144	0.057	0.087
Electricity	kWh	11/29/2012	12/27/2012	54	18563	\$1,104	\$1,614	\$2,718	\$0.146	0.059	0.087
Electricity	kWh	12/28/2012	1/27/2013	33	17900	\$1,109	\$1,556	\$2,665	\$0.149	0.062	0.087
Electricity	kWh	1/28/2013	2/26/2013	51	19007	\$1,127	\$1,653	\$2,779	\$0.146	0.059	0.087
Electricity	kWh	2/27/2013	3/27/2013	33	17613	\$1,063	\$1,531	\$2,594	\$0.147	0.060	0.087
Electricity	kWh	3/28/2013	4/28/2013	74	26116	\$1,400	\$2,271	\$3,671	\$0.141	0.054	0.087
Electricity	kWh	4/29/2013	5/28/2013	65	30467	\$1,483	\$2,649	\$4,132	\$0.136	0.049	0.087
TOTAL / AVERAGE				89.1	357,414	\$17,866	\$31,077	\$48,943	\$0.137	0.050	0.087

Note: There are two electric meters for all of the buildings on the Cumberland County College campus. The usage of this building was estimated based on square footage compared to the total square footage of all building on the same meter.



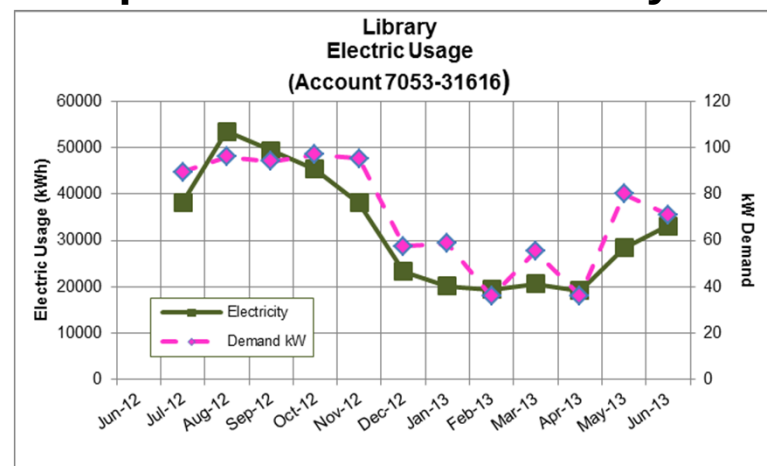
Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary

Library - Electric

- The building is not separately metered. Therefore, electricity consumption is estimated based on building area.

Time-period: Jun. 2012 – May 2013



Facility Name: Library											
Address: 3322 College Dr, Vineland, NJ 08360											
Account #: 7053-31616 (shared)											
Meter#: E31492 (Shared)											
										Delivery	Supply
Energy Type	Energy Unit	Start Date	End Date	Demand kW	Usage kWh	Delivery Cost	Supplier Cost	Total Cost	\$/kWh	\$/kWh	\$/kWh
Electricity	kWh	6/12/2012	7/12/2012	90	38207	\$1,872	\$3,242	\$5,114	\$0.134	0.049	0.085
Electricity	kWh	7/13/2012	8/13/2012	96	53506	\$2,622	\$4,447	\$7,069	\$0.132	0.049	0.083
Electricity	kWh	8/14/2012	9/12/2012	94	49394	\$2,420	\$4,182	\$6,602	\$0.134	0.049	0.085
Electricity	kWh	9/13/2012	10/10/2012	97	45363	\$1,883	\$3,563	\$5,445	\$0.120	0.042	0.079
Electricity	kWh	10/11/2012	11/12/2012	95	38062	\$1,580	\$2,874	\$4,453	\$0.117	0.042	0.076
Electricity	kWh	11/13/2012	12/10/2012	58	23290	\$967	\$1,853	\$2,820	\$0.121	0.042	0.080
Electricity	kWh	12/11/2012	1/11/2013	59	20200	\$838	\$1,601	\$2,439	\$0.121	0.042	0.079
Electricity	kWh	1/12/2013	2/12/2013	36	19478	\$808	\$1,476	\$2,284	\$0.117	0.042	0.076
Electricity	kWh	2/13/2013	3/11/2013	55	20682	\$858	\$1,650	\$2,508	\$0.121	0.042	0.080
Electricity	kWh	3/12/2013	4/9/2013	36	19165	\$795	\$1,495	\$2,291	\$0.120	0.042	0.078
Electricity	kWh	4/10/2013	5/9/2013	80	28418	\$1,179	\$2,142	\$3,322	\$0.117	0.042	0.075
Electricity	kWh	5/10/2013	6/11/2013	71	33152	\$1,459	\$2,782	\$4,241	\$0.128	0.044	0.084
TOTAL / AVERAGE				96.9	388,919	\$17,281	\$31,307	\$48,588	\$0.124	0.044	0.080

Note: There are two electric meters for all of the buildings on the Cumberland County College campus. The usage of this building was estimated based on square footage compared to the total square footage of all building on the same meter.



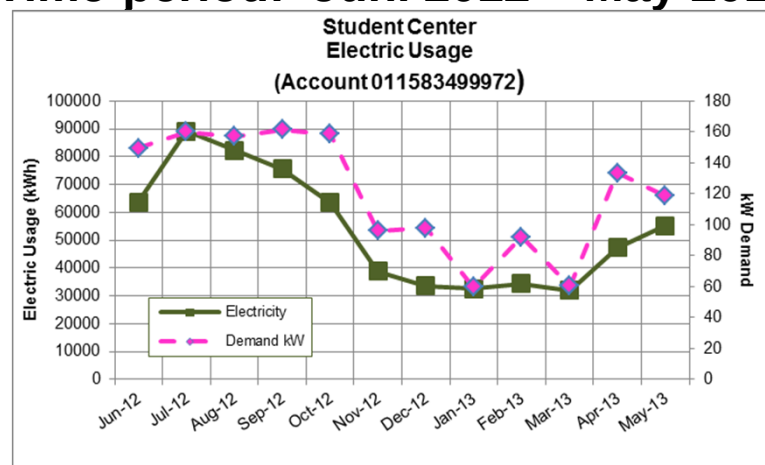
Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary

Student Center - Electric

- The building is not separately metered. Therefore, electricity consumption is estimated based on building area.

Time-period: Jun. 2012 – May 2013



Facility Name: Student Center
Address: 3322 College Dr,
Vineland, NJ 08360
Account #: 0115-8349-9972 (Shared)
Meter#: 86422420 (Shared)

										Delivery	Supply
Energy Type	Energy Unit	Start Date	End Date	Demand kW	Usage kWh	Delivery Cost	Supplier Cost	Total Cost	\$/kWh	\$/kWh	\$/kWh
Electricity	kWh	5/28/2012	6/26/2012	149	63696	\$2,629	\$5,538	\$8,167	\$0.128	0.041	0.087
Electricity	kWh	6/27/2012	7/29/2012	160	89201	\$3,982	\$7,756	\$11,738	\$0.132	0.045	0.087
Electricity	kWh	7/30/2012	8/27/2012	157	82345	\$3,660	\$7,160	\$10,820	\$0.131	0.044	0.087
Electricity	kWh	8/28/2012	9/27/2012	162	75625	\$3,550	\$6,576	\$10,126	\$0.134	0.047	0.087
Electricity	kWh	9/28/2012	10/28/2012	159	63454	\$3,151	\$5,517	\$8,668	\$0.137	0.050	0.087
Electricity	kWh	10/29/2012	11/28/2012	96	38827	\$2,223	\$3,376	\$5,599	\$0.144	0.057	0.087
Electricity	kWh	11/29/2012	12/27/2012	98	33675	\$2,002	\$2,928	\$4,930	\$0.146	0.059	0.087
Electricity	kWh	12/28/2012	1/27/2013	60	32472	\$2,011	\$2,823	\$4,834	\$0.149	0.062	0.087
Electricity	kWh	1/28/2013	2/26/2013	92	34479	\$2,044	\$2,998	\$5,042	\$0.146	0.059	0.087
Electricity	kWh	2/27/2013	3/27/2013	60	31950	\$1,928	\$2,778	\$4,707	\$0.147	0.060	0.087
Electricity	kWh	3/28/2013	4/28/2013	133	47376	\$2,540	\$4,119	\$6,659	\$0.141	0.054	0.087
Electricity	kWh	4/29/2013	5/28/2013	119	55268	\$2,690	\$4,806	\$7,495	\$0.136	0.049	0.087
TOTAL / AVERAGE				161.6	648,368	\$32,410	\$56,375	\$88,785	\$0.137	0.050	0.087

Note: There are two electric meters for all of the buildings on the Cumberland County College campus. The usage of this building was estimated based on square footage compared to the total square footage of all building on the same meter.



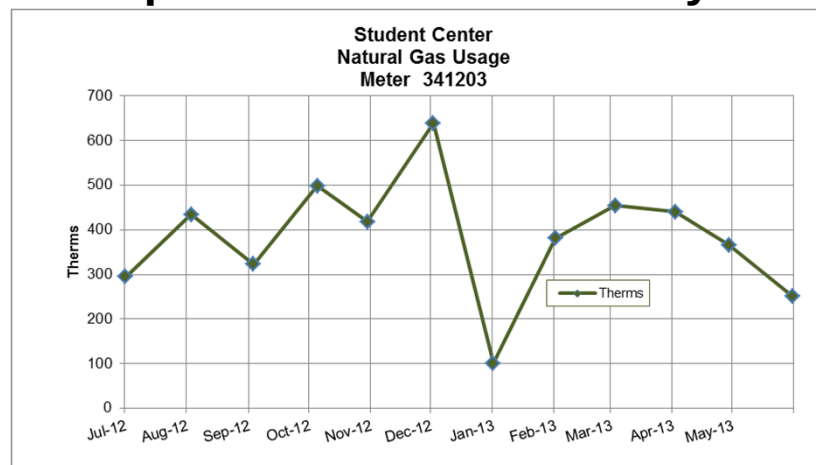
Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary

Student Center - Gas

- Cafeteria cooking equipment and a domestic hot water heater are connected to this meter.

Time-period: Jun. 2012 – May. 2013



Facility Name: Student Center									Delivery	Supply
Address: 3322 College Dr, Vineland, NJ 08360										
Account #: 31018410006										
Meter#: 341203										
Energy Type	Energy Unit	Start Date	End Date	Therms	Delivery Cost	Supplier Cost	Total Cost	\$/Therm	\$/Therm	\$/Therm
Natural Gas	Therms	6/11/2012	7/11/2012	294	\$125	\$159	\$285	\$0.97	\$0.43	\$0.54
Natural Gas	Therms	7/11/2012	8/13/2012	434	\$188	\$235	\$422	\$0.97	\$0.43	\$0.54
Natural Gas	Therms	8/13/2012	9/13/2012	323	\$135	\$175	\$310	\$0.96	\$0.42	\$0.54
Natural Gas	Therms	9/13/2012	10/15/2012	498	\$203	\$270	\$473	\$0.95	\$0.41	\$0.54
Natural Gas	Therms	10/15/2012	11/9/2012	419	\$171	\$227	\$397	\$0.95	\$0.41	\$0.54
Natural Gas	Therms	11/9/2012	12/12/2012	639	\$255	\$346	\$601	\$0.94	\$0.40	\$0.54
Natural Gas	Therms	12/12/2012	1/11/2013	101	\$42	\$55	\$96	\$0.95	\$0.41	\$0.54
Natural Gas	Therms	1/11/2013	2/11/2013	381	\$149	\$206	\$355	\$0.93	\$0.39	\$0.54
Natural Gas	Therms	2/11/2013	3/13/2013	454	\$180	\$246	\$426	\$0.94	\$0.40	\$0.54
Natural Gas	Therms	3/13/2013	4/12/2013	440	\$172	\$238	\$410	\$0.93	\$0.39	\$0.54
Natural Gas	Therms	4/12/2013	5/9/2013	365	\$157	\$198	\$355	\$0.97	\$0.43	\$0.54
Natural Gas	Therms	5/9/2013	6/10/2013	251	\$107	\$136	\$242	\$0.97	\$0.43	\$0.54
Totals/Average				4,600	\$1,883	\$2,489	\$4,373	\$0.95	\$0.43	\$0.54



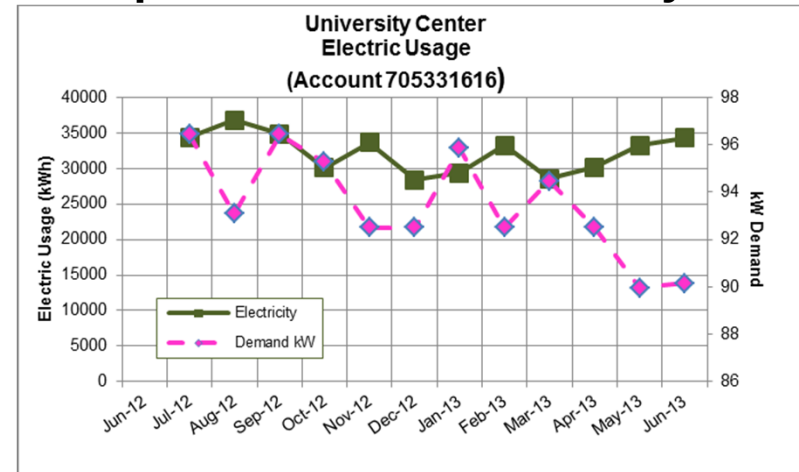
Historic Energy Consumption (cont'd)

Utility Usage and Costs Summary

University Center - Electric

- The building is not separately metered. Therefore, electricity consumption is estimated based on building area.

Time-period: Jun. 2012 – May 2013



Facility Name: University Center
Address: 3322 College Dr,
Vineland, NJ 08360
Account #: 7053-31616 (Shared)
Meter#: E31492 (Shared)

										Delivery	Supply
Energy Type	Energy Unit	Start Date	End Date	Demand kW	Usage kWh	Delivery Cost	Supplier Cost	Total Cost	\$/kWh	\$/kWh	\$/kWh
Electricity	kWh	6/12/2012	7/12/2012	96	34386	\$1,685	\$2,918	\$4,603	\$0.134	0.049	0.085
Electricity	kWh	7/13/2012	8/13/2012	93	36747	\$1,801	\$3,054	\$4,855	\$0.132	0.049	0.083
Electricity	kWh	8/14/2012	9/12/2012	96	34811	\$1,706	\$2,947	\$4,653	\$0.134	0.049	0.085
Electricity	kWh	9/13/2012	10/10/2012	95	30087	\$1,249	\$2,363	\$3,612	\$0.120	0.042	0.079
Electricity	kWh	10/11/2012	11/12/2012	93	33630	\$1,396	\$2,539	\$3,935	\$0.117	0.042	0.076
Electricity	kWh	11/13/2012	12/10/2012	93	28387	\$1,178	\$2,259	\$3,437	\$0.121	0.042	0.080
Electricity	kWh	12/11/2012	1/11/2013	96	29379	\$1,219	\$2,328	\$3,547	\$0.121	0.042	0.079
Electricity	kWh	1/12/2013	2/12/2013	93	33252	\$1,380	\$2,519	\$3,899	\$0.117	0.042	0.076
Electricity	kWh	2/13/2013	3/11/2013	94	28529	\$1,184	\$2,276	\$3,460	\$0.121	0.042	0.080
Electricity	kWh	3/12/2013	4/9/2013	93	30182	\$1,253	\$2,355	\$3,607	\$0.120	0.042	0.078
Electricity	kWh	4/10/2013	5/9/2013	90	33205	\$1,378	\$2,503	\$3,881	\$0.117	0.042	0.075
Electricity	kWh	5/10/2013	6/11/2013	90	34291	\$1,509	\$2,878	\$4,387	\$0.128	0.044	0.084
				96.4	386,885	\$16,936	\$30,938	\$47,874	\$0.124	0.044	0.080

Note: There are two electric meters for all of the buildings on the Cumberland County College campus. The usage of this building was estimated based on square footage compared to the total square footage of all building on the same meter.

Portfolio Manager / Energy Star

ENERGY STAR SCORES

- An Energy Star Score is not available for any of the buildings included in this audit due to lack of individual building energy metering.
- Energy Star can be used to compare energy consumption to other similar facilities and to gauge the success of energy conservation and cost containment efforts.
- Buildings with an *Energy Star* rating/score of 75 or above, are eligible to apply for an official *Energy Star* Building label.

Facility Name	Total Floor Area, SF	Energy Star Score	Eligible to Apply for Energy Star	Current Site Energy Intensity (kBtu/SF)	Current Source Energy Intensity (kBtu/SF)	Average Site EUI by Building Type*	Utility Cost Gas \$/SF	Utility Cost Electric \$/SF	Utility Cost Total \$/SF
Academic Building	47,818	N/A	No	174	340	134	\$0.95	\$2.92	\$3.86
Administration	9,202	N/A	No	171	336	134	\$0.95	\$2.92	\$3.86
Library/Distance Learning Center	17,591	N/A	No	172	339	134	\$0.95	\$2.92	\$3.86
Luciano Conference Center	23,212	N/A	No	183	350	134	\$0.95	\$2.92	\$3.86
Wheaton/Navone Healthcare	16,166	N/A	No	170	336	134	\$0.95	\$2.92	\$3.86
Service Building	10,898	N/A	No	170	336	134	\$0.95	\$2.92	\$3.86
Student Services Building (Except Gym)	29,326	N/A	No	185	352	134	\$0.95	\$2.92	\$3.86
University Center	17,499	N/A	No	172	339	134	\$0.95	\$2.92	\$3.86

Average site EUI obtained from Energy Star Portfolio Manager

- *Note that there is no individual electric meters for the buildings at the Cumberland County College. Electricity is metered at two points of entry and then delivered to the buildings.*
- *Each building has an electric sub-meter but currently the consumption is not tracked.*
- *In addition, each building receives district hot and chilled water from the central energy plant. The hot and chilled water consumption of the buildings are not metered.*
- *Energy consumption for each building was estimated based area percentage of the building in the campus and entered into the Energy Star Portfolio Manager. It is recommended to log electricity consumption at each building for accurate monitoring.*
- *It is also recommended to install hot water and chilled water sub meters at each building in order to accurately track energy consumption. Portfolio manager should be updated once accurate energy information is gathered.*



Portfolio Manager / Energy Star (cont'd)

Portfolio Manager Sign-In

- An account has been created for Cumberland County College in Portfolio Manager. You should have received an email to notify you of the generation of this account and shared access with Dome-Tech.
- Now that the report has been finalized, you have full access to use/edit the information and change/update it as necessary.
- Website link to sign-in:

<https://www.energystar.gov/istar/pmpam/index.cfm?fuseaction=login.Login>





Facility Information

Building Name:

Academic Building

Address:

3322 College Drive
Vineland, NJ 08630

Gross Floor Area:

47,818 sq ft

Year Built:

1965

Complete extensive renovation in 2008

Occupants:

Approximately 400 students and 50 staff members

Building Usage:

Academic building houses offices, classrooms computer laboratories. Building scheduled from 8AM to 10PM Monday thru Friday and 8AM to 6 PM on Saturdays. Average occupancy: 14 hours per day, 82 hours per week.



Construction Features:

Façade:

Concrete block and face brick façade, in good condition.

Roof Type:

Built up roof with rubber membrane and gravel covering. Approximately 20 years old, in good condition.

Windows:

Covering 25% of façade, both fixed and operable aluminum frame, double pane glass, in fair condition.

Exterior Doors:

Approximately four (4) sets of doors, aluminum frame with single pane glass in fair condition.

This building is currently under renovation. A complete window system has been procured and is scheduled for replacement in December 2013. All exterior doors are also scheduled for replacement in December 2013.



Facility Information (cont'd)

Major Mechanical Systems – Academic Building

Air Handling / Ventilation Systems

- Ventilation is provided by two (2) dual duct air handling units and packaged rooftop units. Classrooms and the corridors have dual duct air distribution system with mixing boxes in the spaces. The air handling units have variable volume supply and return fans.
- The Computer Tech Buildings are physically connected to the academic building through two tunnels. These buildings are ventilated with packaged rooftop units.

Cooling Systems

- Cooling is provided by two (2) air handling units 120 tons each, two (2) packaged rooftop units (10 tons each) and two (2) 4 tons packaged rooftop heat pump units.
- Chilled water for air handling units provided by central chiller plant.
- There are two (2) 5 HP constant volume chilled water circulation pumps serving the air handling units.

Heating Systems

- Space heating is provided by perimeter hot water baseboard heaters. Some areas receive forced hot air.
- Heating hot water is provided from central boiler plant.
- There are two (2) 3 HP hot water circulation pumps in the building.

Domestic Hot Water

- Domestic Hot Water (DHW) is provided by a 100 gallon natural gas fired AO Smith water heater and a 20 gallon electric domestic water heater.

Controls

- All the HVAC systems and the mixing boxes are scheduled and controlled remotely through the Honeywell central building automation system with local sensors in each zone.



Facility Information

Building Name:

Administration Building

Address:

3322 College Drive
Vineland, NJ 08630

Gross Floor Area:

9,202 sq ft

Year Built:

1965

Occupants:

Approximately 50 staff members

Building Usage:

Building operates roughly between 8AM to 5 PM, Monday - Friday
Average 50 hours per week.



Construction Features:

Condition:

The building is currently undergoing full renovation to all systems.

Façade:

Concrete block and face brick façade, in fair condition.

Roof Type:

Built up roof with rubber and gravel covering. Approximately 20 years old, in fair condition. Insulation not known.

Windows:

Covering 25% of façade, both fixed and operable aluminum frame, double pane and tinted glass, in fair condition.

Exterior Doors:

One (1) set of doors, aluminum frame with single pane glass in fair condition.



Facility Information (cont'd)

Major Mechanical Systems – Administration Building

Air Handling / Ventilation Systems

- Ventilation and air conditioning is provided to the building via a large, dual-deck AHU (Air Handling Unit) located in the rooftop penthouse. The AHU is old and in very poor condition with large air leaks and rust holes.
- In addition to the AHU, there are two packaged rooftop air conditioning units serving several individual offices.

Cooling Systems

- Cooling is provided by the 50 ton (estimated) main Air Handling Unit and two (2) 5-ton packaged rooftop air conditioning units.
- Main AHU is equipped with a chilled water coil, which connected to the campus chilled water loop.
- The rooftop units have DX (direct expansion) coils.
- There are two (2) 2 HP constant volume chilled water circulation pumps serving the air handling units.

Heating Systems

- Heating hot water is provided from central boiler plant.
- Air handling units and the packaged rooftop units are equipped with hot water coils.
- Heating hot water from the campus hot water loop is circulated throughout the building via two (2) 1.5 HP pumps.

Domestic Hot Water

- Domestic Hot Water (DHW) is provided by a 20-gallon electric hot water heater.

Controls

- Rooftop units are controlled via digital thermostats. Air handling unit is controlled via pneumatic control system.

Facility Information

Building Name:

Library

Address:

3322 College Drive
Vineland, NJ 08630

Gross Floor Area:

17,590 sq ft

Year Built:

1965 (Partially renovated in 2007)

Occupants:

Approximately 140 students and 10 staff members

Building Usage:

Library scheduled from 8:30AM to 7PM, Monday to Friday, closed on weekends. Average occupancy: 10 hours per weekday, 50 hours per week total.



Construction Features:

Condition:

This building houses the Library and the Distance Learning Center. The Library portion was completely renovated in 2007. Distance Learning Center is currently under complete renovation.

Façade:

Concrete block and face brick façade, in good condition.

Roof Type:

Built up roof with rubber and gravel covering. Approximately 20 years old, in fair condition. Insulation not known.

Windows:

Covering 25% of façade, both fixed and operable aluminum frame, double pane glass with interior storm windows, in good condition.

Exterior Doors:

Approximately five (5) sets of doors, aluminum frame with double pane glass in good condition.



Facility Information (cont'd)

Major Mechanical Systems – Library

Air Handling / Ventilation Systems

- Ventilation and air conditioning is provided to the building via a large AHU (AHU-1) located in the rooftop penthouse. The AHU is fairly new in excellent condition.
- AHU-1 is equipped with variable frequency drives for both supply and return fans. The air distribution is through VAV boxes scattered around the library hall.
- AHU-1 is connected to a total energy recovery unit (ERU-1).
- CO2 monitoring and demand controlled ventilation is implemented in this building.

Cooling Systems

- AHU-1 has approximately 60 ton cooling capacity. It is connected to the campus chilled water loop.
- There are two (2) 5 HP constant volume chilled water circulation pumps serving the air handling unit.

Heating Systems

- Heating hot water is provided from central boiler plant.
- The main air handling unit is equipped with a hot water coil.
- Heating hot water from the campus hot water loop is circulated throughout the building via two (2) 2 HP pumps.

Domestic Hot Water

- Domestic Hot Water (DHW) is provided by a 30 gallon electric hot water heater.

Controls

- All the HVAC systems are controlled remotely through the Honeywell central building automation system.



Facility Information

Building Name: Luciano Conference Center

Address: 3322 College Drive
Vineland, NJ 08630

Gross Floor Area: 23,212 sq ft

Year Built: 2005

Occupants: Approximately 500

Building Usage: Conference Center

Average occupancy: Building scheduled from 8AM to 10 PM, 7 days per week. Nearly 100 hrs/week



Construction Features:

Façade: Concrete block and face brick façade in excellent condition.

Roof Type: Built up with rubber membrane and gravel covering. Estimated 2" insulation

Windows: Covering 15% of façade, both fixed aluminum frame, double pane glass, excellent condition.

Exterior Doors: Approximately three (3) sets of doors, aluminum frame with double pane glass.



Facility Information (cont'd)

Major Mechanical Systems – Luciano Conference Center

Air Handling / Ventilation Systems

- Ventilation to the conference rooms, meeting rooms, offices and kitchen are provided by four (4) air handling units.
- Air handling units are variable volume units with variable frequency drives.
- CO2 monitoring and demand controlled ventilation is implemented in this building.

Cooling Systems

- Total cooling capacity in the facility is approximately 150 tons. Each air handler is connected to the campus chilled water loop.
- There are two (2) 10 HP constant volume chilled water circulation pumps serving the air handling units.

Heating Systems

- The air handling units are equipped with hot water coils and three-way valves.
- Heating hot water is provided from central boiler plant and it is circulated throughout the building via two (2) 7.5 HP pumps.

Domestic Hot Water

- Domestic hot water (DHW) is provided by a 225 gallon standard efficiency, natural gas fired PVI water heater.

Controls

- All the HVAC systems are controlled remotely through the Honeywell central building automation system.



Facility Information

Building Name:

Wheaton Navone Healthcare Center

Address:

3322 College Drive
Vineland, NJ 08630

Gross Floor Area:

16,165 sq ft

Year Built:

1988, complete renovation and addition in 2008

Occupants:

Approximately 250 students and 30 staff members

Building Usage:

Classrooms, laboratories and offices

Average occupancy:

Building scheduled from 8AM to 6PM, Monday to Friday and closed on weekends. 12 hours per weekday, 60 hours per week total.



Construction Features:

Façade:

Concrete block and face brick façade, in good condition.

Roof Type:

Metal roof, recoated in 2008. The 2008 Addition has built up roof with rubber membrane and gravel covering installed in 2008. Estimated 2" rigid insulation.

Windows:

Covering 25% of façade, both fixed and operable aluminum frame, double pane glass in good condition.

Exterior Doors:

Approximately five (5) sets of doors, set of doors, aluminum frame with double pane glass in good condition.



Facility Information (cont'd)

Major Mechanical Systems – Navone Healthcare Center

Air Handling / Ventilation Systems

- Ventilation and air conditioning are provided by two (2) air handling units.
- Air handling units' supply and return fans have variable frequency drives.
- CO2 monitoring and demand controlled ventilation is implemented in this building.

Cooling Systems

- Total cooling capacity in the facility is approximately 100 tons. Each air handler is connected to the campus chilled water loop.
- There are two (2) 5 HP constant volume chilled water circulation pumps serving the air handling units.

Heating Systems

- The air handling units are equipped with hot water coils and three-way valves.
- Heating hot water is provided from central boiler plant and it is circulated throughout the building via two (2) 5 HP pumps.

Domestic Hot Water

- Domestic Hot Water (DHW) is provided by one (1) 30 gallon electric hot water heater.

Controls

- All the HVAC systems are controlled remotely through the Honeywell central building automation system.
- Each space is served with a VAV box and a corresponding temperature and CO2 sensor.



Facility Information

Building Name:

Service Building

Address:

3322 College Drive
Vineland, NJ 08630

Gross Floor Area:

10,898 sq ft

Year Built:

1965.

Occupants:

Approximately 10 staff members

Building Usage:

Central energy plant and maintenance shop.

Average occupancy:

24/7



Construction Features:

Façade:

Concrete block and face brick façade, in good condition.

Roof Type:

Tar and gravel on the older section. Standing seam metal roof on the new section.

Windows:

Minimal

Exterior Doors:

Several large overhead doors as well as standard double doors.



Facility Information (cont'd)

Major Mechanical Systems – Service Building

Air Handling / Ventilation Systems

- Ventilation is provided with gravity ventilators on the roof. Two rooftop units provide ventilation and air conditioning to the offices.

Cooling Systems

- Cooling provided by two (2) 4-ton packaged rooftop heat pump units for the office area. There is no cooling in the mechanical rooms.

Heating Systems

- Unit heaters in the mechanical rooms. Packaged rooftop electric heat pump units provide offices with heating.

Domestic Hot Water

- Domestic Hot Water (DHW) is provided by one (1) 75 gallon, State natural gas fired hot water heater.

Controls

- Boilers, pumps and chillers are scheduled, controlled and monitored via Honeywell EBI building automation system.



Facility Information

Building Name:

Student Services

Address:

3322 College Drive
Vineland, NJ 08630

Gross Floor Area:

29,326 sq ft

Year Built:

1965

Occupants:

Approximately 500 students and 50 staff members

Building Usage:

Student services, Cafeteria, Security Office

Average occupancy:

Building is scheduled from 7AM to 7PM, Monday to Friday. 12 hours per weekday, 60 hours per week total.



Construction Features:

Façade:

Concrete block and face brick façade, in good condition.

Roof Type:

Built up with rubber membrane and gravel covering. Estimated 2" rigid insulation

Windows:

Covering 20% of façade, both fixed and operable aluminum frame, double pane glass in good condition.

Exterior Doors:

Approximately five (5) sets of doors, set of doors, aluminum frame with double pane glass in good condition.



Facility Information (cont'd)

Major Mechanical Systems – Student Service Building

Air Handling / Ventilation Systems

- Ventilation to the building is provided by four (4) air handling units and one (1) packaged rooftop unit
- Air handling units and the RTU are variable volume units with variable frequency drives.
- CO2 monitoring and demand controlled ventilation is implemented in this building.
- One AHU must remain occupied 24/7/365 for front desk (security).

Cooling Systems

- Total cooling capacity in the facility is approximately 165 tons. Each air handler is connected to the campus chilled water loop.
- There are two (2) 15 HP constant volume chilled water circulation pumps serving the air handling units.

Heating Systems

- Air handling units and the rooftop unit are equipped with hot water coils and three-way valves.
- Heating hot water is provided from central boiler plant and it is circulated throughout the building via two (2) 10 HP pumps.

Domestic Hot Water

- Domestic Hot Water (DHW) is provided by two (2) 100 gallon natural gas fired Laars water heater. These high efficiency condensing heaters are rated at 199,000 Btuh input.

Controls

- All the HVAC systems are controlled remotely through the Honeywell central building automation system.
- Each space is served with a VAV box and a corresponding temperature and CO2 sensor.



Facility Information

Building Name:

University Center

Address:

3322 College Drive
Vineland, NJ 08630

Gross Floor Area:

17,498 sq ft

Year Built:

1965

Occupants:

Approximately 200

Building Usage:

Building is scheduled from 7AM to 7PM, Monday to Friday. Average occupancy: 12 hours per weekday, 60 hours per week total.



Construction Features:

Façade:

Concrete block and face brick façade, in good condition.

Roof Type:

Built up with rubber membrane and gravel covering. Estimated 2" rigid insulation

Windows:

Covering 25% of façade, fixed aluminum frame, double pane glass in good condition.

Exterior Doors:

Approximately five (5) sets of doors, set of doors, aluminum frame with double pane glass in good condition.



Facility Information (cont'd)

Major Mechanical Systems – University Center

Air Handling / Ventilation Systems

- Ventilation to the building is provided by two (2) air handling units
- Air handling units are variable volume units with variable frequency drives.

Cooling Systems

- Total cooling capacity in the facility is approximately 65 tons. The air handling units are connected to the campus chilled water loop.
- There are two (2) 5 HP constant volume chilled water circulation pumps serving the air handling units.

Heating Systems

- Air handling units and the rooftop unit are equipped with hot water coils and three-way valves.
- Heating hot water is provided from central boiler plant and it is circulated throughout the building via two (2) 2 HP pumps.
- Main lobby has in-floor heating system

Domestic Hot Water

- Domestic Hot Water (DHW) is provided by one (1) small electric hot water heater.

Controls

- All the HVAC systems are controlled remotely through the Honeywell central building automation system.
- Each space is served with a VAV box and controlled via a corresponding temperature sensor.

Greenhouse Gas Emission Reduction

Implementation of all identified ECMs will yield:

- 464,112 kilowatt-hours of annual avoided electric usage.
- 63,414 Therms of annual avoided natural gas usage.
- This equates to the following **annual** reductions:

- 526 tons of CO₂;

-OR-

- 91 Cars removed from road;

-OR-

- 143 Acres of trees planted annually



The Energy Information Administration (EIA) estimates that power plants in the state of New Jersey emits 0.666 lbs CO₂ per kWh generated.



The Environmental Protection Agency (EPA) estimates that one car emits 11,560 lbs CO₂ per year.



The EPA estimates that reducing CO₂ emissions by 7,333 pounds is equivalent to planting an acre of trees.



Energy Conservation Measures (ECMs) Notes and Assumptions

- The average CO₂ emission rate from power plants serving the facilities within this report was obtained from the Environmental Protection Agency's (EPA) eGRID2007 report. It is stated that power plants within the state of NJ emit 0.66 lbs of CO₂ per kWh generated.
 - *The EPA estimates that burning one therm of natural gas emits 11.708 lbs CO₂.*
 - *The EPA estimates that one car emits 11,560 lbs CO₂ per year.*
 - *The EPA estimates that reducing CO₂ emissions by 7,333 pounds is equivalent to planting an acre of trees.*
- The following utility prices were used within this study:

Facility	Electric	Natural Gas
	\$ / kWh	\$ / Therm
Cumberland County College	\$0.1316	\$0.98



ECM #1: Vending Machine Power Management

	Academic Building	Admin Building	Navone Building	Student Center	University Center	TOTAL
Estimated Annual Savings:	\$509	\$255	\$255	\$509	\$255	\$1,782
Gross Estimated Implementation Cost:	\$1,156	\$578	\$578	\$1,156	\$578	\$4,046
Approx. NJ Smart Start Rebate:	\$0	\$0	\$0	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$1,156	\$578	\$578	\$1,156	\$578	\$4,046
Simple Payback (years):	2.3	2.3	2.3	2.3	2.3	2.3
Annual Avoided CO ₂ Emissions (tons):	1.3	0.6	0.6	1.3	0.6	4.5

¹ Cost estimates based on vendor quote

² No prescriptive New Jersey Smart Start rebates are available for this measure

	Academic Building	Admin Building	Student Center	University Center	Navone Building	Total
Soda Vending Machine Count	2	1	2	1	1	7
Snack Vending Machine Count	2	1	2	1	1	7

- Dome-Tech recommends installing vending machine power management devices on all snack and soda vending machines.
- These devices reduce electrical energy consumption by turning off the unit's lights and managing compressor cooling cycles when the surrounding area is vacant. It automatically re-powers the cooling system at one to three hour intervals, independent of sales, to ensure that the product stays cold.
- The microcontroller will never power down the machine while the compressor is running, eliminating compressor short-cycling. In addition, when the machine is powered up, the cooling cycle is allowed to finish before again powering down (which reduces compressor wear and tear).
- This measure can be implemented by the operations staff.
- This ECM is not expected to reduce the buildings' electrical demand.
- Detailed calculations can be found in the Appendix at the end of the report.



ECM #2: Domestic Water Heater Timers

	Academic Building	Admin Building	Conference Center	Library	Student Center	TOTAL
Estimated Annual Savings:	\$53	\$34	\$62	\$91	\$62	\$302
Gross Estimated Implementation Cost:	\$600	\$300	\$300	\$300	\$300	\$1,800
Approx. NJ Smart Start Rebate:	\$0	\$0	\$0	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$600	\$300	\$300	\$300	\$300	\$1,800
Simple Payback (years):	11.3	8.9	4.9	3.3	4.9	6.0
Annual Avoided CO ₂ Emissions (tons):	0.1	0.2	0.3	0.2	0.3	1.2

¹ Cost estimates based on vendor quote

² No prescriptive New Jersey Smart Start rebates are available for this measure

- Currently, DHW circulators operate 24/7 at the schools listed above.
- There is a continued heat loss on the DHW heaters during unoccupied hours of the buildings due to continuous circulation of the hot water. The heat loss occurs on the circulation loop.
- Installing timers on the domestic hot water circulators will eliminate water circulation during unoccupied hours. This will reduce/eliminate the energy used to make up for the pipe heat loss in each building.



ECM #2: Domestic Water Heater Timers (Cont'd)

Summary of Timer Installation on the Domestic Hot Water Circulators

Building	Equipment	Quantity	Manufacturer	Model Number	Fuel Type	Input Btu/h	Input Watts	Capacity (gallons)	Add Timer
Academic Building	DHW	1	Bradford White	M-I-20U5SS-12	Electric	N/A	1,500	19.9	Y
Admin Building	DHW	1	N/A	N/A	Electric	N/A	N/A	20	Y
Conference Center	DHW	1	PVI	500N225A-TP	Natural Gas	399,000	N/A	225	Y
Navone Center	DHW	1	A.O Smith	DSE30	Electric	N/A	12,000	30	N
Library	DHW	1	A.O Smith	Del-30-110	Electric	N/A	4,500	30	Y
Student Center	DHW	1	AO Smith	BTR-154-110	Natural Gas	154,000	N/A	81	Y
University Center	DHW	1	AO Smith	N/A	Electric	N/A	N/A	N/A	N



ECM #3: Computer Power Management System

	Academic Building	Administration Building	Conference Center	Library	Navone Healthcare Center
Number of Computers	320	34	27	118	60
Estimated Annual Savings:	\$1,474	\$157	\$124	\$544	\$276
Gross Estimated Implementation Cost ¹ :	\$9,600	\$1,020	\$810	\$3,540	\$1,800
Approx. NJ Smart Start Rebate ² :	\$0	\$0	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$9,600	\$1,020	\$810	\$3,540	\$1,800
Simple Payback (years):	6.5	6.5	6.5	6.5	6.5
Annual Avoided CO ₂ Emissions (tons):	3.7	0.4	0.3	1.4	0.7
	Service Building	Student Center	University Center	TOTAL	
Number of Computers	7	96	27	689	
Estimated Annual Savings:	\$32	\$442	\$124	\$3,174	
Gross Estimated Implementation Cost ¹ :	\$210	\$2,880	\$810	\$20,670	
Approx. NJ Smart Start Rebate ² :	\$0	\$0	\$0	\$0	
Net Estimated Implementation Cost:	\$210	\$2,880	\$810	\$20,670	
Simple Payback (years):	6.5	6.5	6.5	6.5	
Annual Avoided CO ₂ Emissions (tons):	0.1	1.1	0.3	8.0	

¹ Cost estimates based on vendor quote
² No prescriptive New Jersey Smart Start rebates are available for this measure

- A number of desktop computers were observed to be running in screen saver mode after school hours.
- Computer screen savers were originally developed to prevent the permanent etching of patterns on older monochrome monitors. In this mode, both the computer and monitor consume the same amount of energy as the computer in regular operation, which is approximately 225W for the computer and 75W for the monitor.
- Dome-Tech recommends installing a campus wide computer power management system (such as Verdiem's Surveyor software). This software would place the computers into a standby/sleep mode during periods of inactivity. In this mode, the computer and monitor will draw between 1 and 3 Watts each. This would significantly reduce the computers electrical energy consumption.
 - The computers will "wake up" instantaneously when the mouse or button on the keyboard is touched, causing no interruption during daytime use.
 - When the computers "wake up," all active files and programs will be available as before entering the standby/sleep mode, ensuring no data will be lost.
- This ECM is not expected to reduce the building(s)' electrical demand.
- Detailed calculations can be found in the Appendix at the end of the report.



ECM #4: Lighting Upgrade

	Academic Building	Administration Building	Conference Center	Library
Estimated Annual Savings:	\$4,907	\$1,646	\$1,191	\$2,629
Gross Estimated Implementation Cost ¹ :	\$44,899	\$14,080	\$8,368	\$20,032
Approx. NJ Smart Start Rebate ² :	\$7,775	\$2,385	\$935	\$3,375
Net Estimated Implementation Cost:	\$37,124	\$11,695	\$7,433	\$16,657
Simple Payback (years):	7.6	7.1	6.2	6.3
Annual Avoided CO ₂ Emissions (tons):	13.2	4.0	3.2	7.1

	Navone Healthcare Center	Service Building	Student Center	University Center	TOTAL
Estimated Annual Savings:	\$1,966	\$1,440	\$3,308	\$1,529	\$18,615
Gross Estimated Implementation Cost ¹ :	\$18,247	\$5,461	\$28,410	\$19,382	\$158,879
Approx. NJ Smart Start Rebate ² :	\$1,650	\$435	\$4,045	\$2,970	\$23,570
Net Estimated Implementation Cost:	\$16,597	\$5,026	\$24,365	\$16,412	\$135,309
Simple Payback (years):	8.4	3.5	7.4	10.7	7.3
Annual Avoided CO ₂ Emissions (tons):	4.8	3.5	8.0	4.1	48

¹ Cost estimates based on actual costs of similar comprehensive lighting projects; see room-by-room surveys in Appendix for details

Dome-Tech, performed a room-by-room lighting audit of all campus buildings. Audit findings and recommendations are summarized below:

Existing Conditions and Recommendations – Lighting Equipment and Controls

➤ **Academic Building**

- Majority of interior space lighting is provided with 1'x4' and 2'x4' recessed fixtures with 32W T8 lamps and standard electronic ballasts. There are small number of fixtures with T12 lamps and magnetic ballasts.
- Corridors are lit with high efficiency 2'x2' direct/indirect fixtures with T5 lamps.
- The Lecture Halls has recessed incandescent lamps, some of which are recently upgraded to LEDs.
- There is an automatic lighting control system in this building.

ECM #4: Lighting Upgrade (cont'd)

➤ **Academic Building (Cont'd)**

- It is recommended to re-lamp and re-ballast all the existing light fixtures using 32W T8 lamps with 28W T8 lamps and high efficiency electronic ballasts.
- It is also recommended to continue with the replacement of incandescent lamps with dimmable LED lamps in the conference rooms.
- Dual technology occupancy sensors should be installed in all the classrooms and offices.
- A detailed list of existing lighting fixtures can be found in the Appendix at the end of the report.

➤ **Administration Building**

- Existing lighting equipment consists of 1'x4' recessed fluorescent fixtures with T12 lamps and magnetic ballasts.
- The remaining fixtures use 2'x4' recessed fixtures with fluorescent 32W T8 lamps and 1'x4' pendant fixtures with 32W T8 lamps with standard electronic ballasts.
- It is recommended to re-lamp and re-ballast all the existing fluorescent light fixtures using T12 lamps or 32W T8 lamps with 28W T8 lamps and high efficiency electronic ballasts.
- Dual technology occupancy sensors should be installed in the offices.
- A detailed list of existing lighting fixtures can be found in the Appendix at the end of the report.

➤ **Conference Center**

- Mainly 2'x4' recessed fluorescent fixtures with 32W T8 lamps.
- Corridors and restrooms are lit with CFL lamps in recessed fixtures and architectural pendant fixtures.
- It is recommended to re-lamp and re-ballast all the existing light fixtures using 32W T8 lamps with 28W T8 lamps and high efficiency electronic ballasts.
- Dual technology occupancy sensors should be installed in spaces where applicable.
- A detailed list of existing lighting fixtures can be found in the Appendix at the end of the report.

ECM #4: Lighting Upgrade (cont'd)

➤ **Library**

- Lighting for the majority of the Library is provided with 2'x4' recessed fluorescent fixtures with T8 lamps.
- Main library hall has pendant direct/indirect fixtures with T8 lamps and electronic ballasts.
- Lobby is lit with CFLs in recessed fixtures.
- It is recommended to re-lamp and re-ballast all the existing light fixtures using 32W T8 lamps with 28W T8 lamps and high efficiency electronic ballasts.
- Dual technology occupancy sensors should be installed in the offices.
- A detailed list of existing lighting fixtures can be found in the Appendix at the end of the report.

➤ **Wheaton/Navone Building**

- Majority of lighting is provided with 2'x4' recessed fluorescent fixtures with 32W T8 lamps.
- Corridors are lit by 1'x4' pendant direct/indirect fluorescent fixtures with 32W T8 lamps.
- It is recommended to re-lamp and re-ballast all the existing light fixtures using 32W T8 lamps with 28W T8 lamps and high efficiency electronic ballasts.
- Dual technology occupancy sensors should be installed in the offices.
- A detailed list of existing lighting fixtures can be found in the Appendix at the end of the report.

➤ **Service Building**

- Majority of lighting is provided with 8' fluorescent strips with F96T12/60W lamps and magnetic ballasts.
- The offices are lit with 2'x4' recessed fixtures with 32W T8 lamps .
- It is recommended to re-lamp and re-ballast all the existing light fixtures with 28W T8 lamps and high efficiency electronic ballasts.
- Dual technology occupancy sensors should be installed in the offices.
- A detailed list of existing lighting fixtures can be found in the Appendix at the end of the report.

ECM #4: Lighting Upgrade (cont'd)

➤ **Student Center**

- Mostly 2'x4' recessed troffers with T-8 lamps.
- Book store has incandescent flood lights.
- Corridors and vestibules are lit with CFLs in recessed fixtures.
- It is recommended to re-lamp and re-ballast all the existing light fixtures using 32W T8 lamps with 28W T8 lamps and high efficiency electronic ballasts.
- Incandescent display lights in the bookstore should be re-lamped with LEDs.
- Dual technology occupancy sensors should be installed where applicable.
- A detailed list of existing lighting fixtures can be found in the Appendix at the end of the report.

➤ **University Center**

- Majority of lighting is provided with 2'x4' recessed fluorescent fixtures with 32W T8 lamps .
 - Corridors and vestibules are lit with CFLs.
 - It is recommended to re-lamp and re-ballast all the existing light fixtures using 32W T8 lamps with 28W T8 lamps and high efficiency electronic ballasts.
 - Dual technology occupancy sensors should be installed where applicable.
- A detailed list of existing lighting fixtures can be found in the Appendix at the end of the report.

➤ **Exterior Lighting**

- Exterior lighting for the majority buildings is provided with pole lights detached from the buildings. The pole lights are fitted with High Pressure Sodium lamps. It is reported that the pole lights are on a dedicated circuit and they are not fed from the buildings.
- Some of the buildings have additional exterior lighting with a combination of wall mount fixtures and recessed canopy fixtures. These fixtures use incandescent and metal halide lamps.
- All of the wall-mount exterior light fixtures (with metal halide or incandescent lamps) should be replaced with LED wall-packs.
- A detailed list of existing lighting fixtures can be found in the Appendix at the end of the report.

ECM #5: Chiller Plant Optimization

	Service Building	TOTAL
Estimated Annual Savings:	\$29,182	\$29,182
Gross Estimated Implementation Cost:	\$223,116	\$223,116
Approx. NJ Smart Start Rebate:	\$0	\$0
Net Estimated Implementation Cost:	\$223,116	\$223,116
Simple Payback (years):	7.6	7.6
Annual Avoided CO ₂ Emissions (tons):	74	74



- The central chiller plant is comprised of a total of five (5) chillers at various characteristics and sizes. The plant has one (1) 375-ton Carrier variable speed screw chiller, one (1) 300-ton centrifugal chiller and three (3) Carrier constant speed screw chillers at 100 to 150 ton capacities.
- The campus chilled water system is characterized as constant volume primary/secondary/tertiary system
- The condenser water pumps operate at constant volume as well.
- Significant energy savings can be achieved by implementing high efficiency chiller plant control systems and strategies.
- Dome-Tech recommends following measures:
 - Implement ECM #7 (Variable Frequency Drives on tertiary pumps and eliminate chilled water loop by-pass
 - Install Variable Frequency Drives on Main Chilled Water Pumps and vary flow based on static pressure or load. Set campus chilled water loop minimum flow to 75% (Should be verified during engineering).
 - Install Variable Frequency Drives on Condenser Water Pumps and vary speed based on ambient temperature and/or load. Set minimum condenser water flow to 80% (Should be verified during engineering).
 - Implement condenser water supply temperature reset based on outside air wet-bulb temperature.
 - Run chiller #5 as much as possible based on suggested dispatch strategy explained in the Appendix.
 - This ECM requires further analysis before implementation. It must be accepted as a general guideline for optimizing the chiller plant using modern control equipment and techniques.

ECM #6: Rooftop Unit Fuel Switch

	Administration Building	TOTAL
Estimated Annual Savings:	\$2,895	\$2,895
Gross Estimated Implementation Cost:	\$28,400	\$28,400
Approx. NJ Smart Start Rebate:	\$460	\$460
Net Estimated Implementation Cost:	\$27,940	\$27,940
Simple Payback (years):	9.7	9.7
Annual Avoided CO ₂ Emissions (tons):	2.2	2.2



- Rooftop units at Administration Building are equipped with electric resistance heating.
- It is recommended to replace electric heating coils with hot water coils in order to reduce operating costs. Electric is generally three times as expensive as natural gas if it is used directly for space heating.



ECM #7: Daylight Harvesting

	Conference Center	University Center	TOTAL
Estimated Annual Savings:	\$323	\$268	\$591
Gross Estimated Implementation Cost:	\$4,000	\$3,000	\$7,000
Approx. NJ Smart Start Rebate:	\$0	\$0	\$0
Net Estimated Implementation Cost:	\$4,000	\$3,000	\$7,000
Simple Payback (years):	12.4	11.2	11.8
Annual Avoided CO ₂ Emissions (tons):	0.8	0.7	1.5

No prescriptive New Jersey Smart Start rebates are available for this measure

- Daylight harvesting takes advantage of free natural light through windows and skylights; thus, artificial energy is reduced.
- Daylight harvesting controls includes placing photocells on the applicable light fixtures.
- The photocells will automatically shut off or dim the lights as the amount of natural light increases ensuring adequate level lights.
- Following spaces are suitable for daylight harvesting controls:
 - University Center Atrium
 - Luciano Conference Center Atrium
- Detailed calculations can be found in the Appendix at the end of the report.

ECM #8: Premium Efficiency Motors

	Admin Building	Library	TOTAL
Estimated Annual Savings:	\$304	\$126	\$430
Gross Estimated Implementation Cost:	\$4,016	\$2,181	\$6,197
Approx. NJ Smart Start Rebate:	\$115	\$90	\$205
Net Estimated Implementation Cost:	\$3,901	\$2,091	\$5,992
Simple Payback (years):	12.8	16.6	13.9
Annual Avoided CO ₂ Emissions (tons):	0.8	0.3	1.1

- The majority of the fans and pumps at the Cumberland County College are driven with high or premium efficiency motors and connected to VFDs which adjust the speed of the motors.
- Motors in the central plant were handled in a separate ECM.
- Remaining standard efficiency motors can be upgraded to premium efficiency motors.
- Only a few standard efficiency motors were found during the site survey. Due to small sizes and low run hours, many pumps and fans yield high payback. Only two motors identified for this ECM: Library and Admin Building AHU supply motors (7.5 HP and 15 HP), which still has relatively high payback.
- Due to high payback and negative net present value, it is not recommended to implement this ECM as an energy savings project unless it can be done in-house.
- Only 5HP or larger motors were considered for this ECM. Detailed list for motor can be found in the ECM #6 Appendix.



ECM #9: Variable Frequency Drives and 2-way Valves

	Academic Building	Conference Center	Library	Navone Building
Estimated Annual Savings:	\$1,322	\$3,851	\$1,222	\$2,173
Gross Estimated Implementation Cost:	\$15,492	\$62,191	\$13,608	\$44,634
Approx. NJ Smart Start Rebate:	\$108	\$342	\$0	\$216
Net Estimated Implementation Cost:	\$15,384	\$61,849	\$13,608	\$44,418
Simple Payback (years):	11.6	16.1	11.1	20.4
Annual Avoided CO ₂ Emissions (tons):	3.3	9.7	3.1	5.5

	Student Center	University Center	TOTAL
Estimated Annual Savings:	\$5,594	\$1,222	\$15,386
Gross Estimated Implementation Cost:	\$82,809	\$13,183	\$231,916
Approx. NJ Smart Start Rebate:	\$388	\$108	\$1,162
Net Estimated Implementation Cost:	\$82,421	\$13,075	\$230,754
Simple Payback (years):	14.7	10.7	15.0
Annual Avoided CO ₂ Emissions (tons):	14.2	3.1	38.9

No prescriptive New Jersey Smart Start rebates are available for this measure



ECM #9: Variable Frequency Drives and 2-way Valves (cont'd)

Building	Number of CHW Pumps	Number of HW Pumps	Number of AHU	Number of 2-Way Valve to Install	Prem. Efcy. Motor to Install	VFD to Install
Academic Building	2	2	2	2	Y	Y
Conference Center	2	2	4	8	Y	Y
Library	2	2	1	1	N	Y
Navone Building	2	2	2	4	Y	Y
Student Center	2	2	4	8	Y	Y
University Center	2	2	2	2	Y	Y
Total	12	12	15	25	Y	Y

- The CHW and HW circulating pumps have standard motors running at constant speed.
- Dome-tech recommend installing variable frequency drives and replacing the motors with premium efficiency, inverter duty motors on the pump.
- Annual system pumping cost will be reduced by installing variable frequency drive on the pump motors.
- 3-way valves should be removed and replaced with 2-way valves. Also, 3-way valves at the furthest unit from the loop should remain to eliminate possible dead heading of the system.
- This ECM is only recommended for 5 HP motors or larger.



ECM #10: Demand Controlled Kitchen Ventilation

	Student Center	TOTAL
Estimated Annual Savings:	\$1,893	\$1,893
Gross Estimated Implementation Cost:	\$33,500	\$33,500
Approx. NJ Smart Start Rebate:	\$0	\$0
Net Estimated Implementation Cost:	\$33,500	\$33,500
Simple Payback (years):	17.7	17.7
Annual Avoided CO ₂ Emissions (tons):	7	7

- The kitchen serving the Student Center Cafeteria has a large cooking hood. The hood is connected to an exhaust fan which runs at constant speed during the operating hours of the kitchen.
- A kitchen make-up air unit (MUA) provides fresh ventilation air to the kitchen when the exhaust fan is ON.
- A n intelligent kitchen hood exhaust fan controls can be installed in order to vary the speed of the exhaust fan and the make up air unit (MUA) supply fan and optimize the amount of total kitchen exhaust and make-up air.
- Savings will be generated during both summer and winter months by reducing the amount of pre-conditioned make-up air.
- The system includes temperature and smoke sensors, which detects cooking activity and adjusts exhaust and make-up fan speeds accordingly. The system also includes installation of VFDs on the exhaust and make-up air fans.
- This measure is not recommended for implementation at this time due to its long payback.

ECM #11: Boiler Replacement

	Service Building	TOTAL
Estimated Annual Savings:	\$23,270	\$23,270
Gross Estimated Implementation Cost:	\$450,000	\$450,000
Approx. NJ Smart Start Rebate:	\$9,000	\$9,000
Net Estimated Implementation Cost:	\$441,000	\$441,000
Simple Payback (years):	19.0	19.0
Annual Avoided CO ₂ Emissions (tons):	144	144



- The central boiler plant includes two (2) fairly new Hurst fire-tube hot water boilers and three (3) old HB Smith Cast Iron hot water boilers.
- Each Hurst Boiler's input capacity is 6,000 MBH, while each HB Smith Boiler's input capacity is average 2,700 MBH.
- HB Smith Boilers range between 33 to 47 years in age.
- Cast iron boilers run during the summer and shoulder season for hot water reheat.
- Cast iron boilers have limited hot water supply temperature reset schedule capability to prevent thermal shock and cracking.
- Dome-Tech recommends replacing the old cast iron boilers with similar sized modular condensing hot water boilers.
- The Hurst boilers were not included in this ECM because they are 3 and 10 years old and they are within their ASHRAE estimated service life.
- It is recommended to run the proposed high efficiency condensing boilers at all times especially during the cooling season (for reheat) and shoulder months.
- An aggressive hot water supply temperature reset strategy is required to achieve proposed savings.
- See Appendix for detailed calculations

ECM #12: Heat Recovery Chiller Installation

	Service Building	TOTAL
Estimated Annual Savings:	\$11,785	\$11,785
Gross Estimated Implementation Cost:	\$250,000	\$250,000
Approx. NJ Smart Start Rebate:	\$0	\$0
Net Estimated Implementation Cost:	\$250,000	\$250,000
Simple Payback (years):	21.2	21.2
Annual Avoided CO ₂ Emissions (tons):	178	178



- Central plant provides hot water to the campus year round.
- Hot water is used for VAV reheat coils during summer months.
- A heat reclaim chiller can be installed in order to recover compression energy and use it for water heating. Heat reclaim chiller can operate during summer months and eliminate natural gas consumption.
- Heat reclaim chillers use slightly more power than standard water cooled chillers. However, they are capable of reclaiming the heat produced during the compression process and providing it as a by-product at approximately 130 to 140°F.
- A 200 Ton heat reclaim chiller can be installed at the Cumberland County College central chiller plant in order to reduce or eliminate natural gas consumption during the cooling season.
- Reclaimed heat can be utilized in the campus hot water loop at 130°F for VAV reheat.
- This ECM is not recommended for implementation at this time due to its long payback. The ECM requires further investigation and it should be considered as a general guideline.



ECM #13: AC Unit Upgrades

	Academic Building (Computer Tech Labs)	Admin Building	Service Building	TOTAL
Estimated Annual Savings:	\$1,979	\$1,718	\$2,746	\$6,443
Gross Estimated Implementation Cost:	\$65,680	\$49,536	\$27,744	\$142,960
Approx. NJ Smart Start Rebate:	\$548	\$1,657	\$368	\$2,572
Net Estimated Implementation Cost:	\$65,133	\$47,879	\$27,376	\$140,388
Simple Payback (years):	32.9	27.9	10.0	21.8
Annual Avoided CO ₂ Emissions (tons):	5.0	8.6	-0.8	12.9

- The Administration Building air handling unit (AHU-1) is in very poor condition with major air leaks.
- The rooftop units at the Academic Building's Computer Tech Labs and Service Building are past their ASHRAE 15 year estimated end of equipment service life.
- Service building A/C units have electric heating coils. There is hot water and natural gas readily available in this building.
- Dome-Tech investigated the energy savings opportunities derived from replacing these units with high efficiency units and also piping natural gas for the service building rooftop units in order to eliminate electric heating. Replacing these units with modern, high efficiency units with natural gas heating coils will reduce annual energy costs.
- There are available rebates and incentives from New Jersey SmartStart program for installation of high efficiency packaged HVAC units. See Appendix for energy savings calculations, rebates and incentives.
- This measure is not recommended for implementation as an energy efficiency project at this time due to its long payback, yet should be considered as an "End of life project".

ECM #13: AC Unit Upgrades (Cont'd)

Incremental Analysis

- Replacing Academic Building Tech Labs A/C units and the Administration Building AHU yield very high payback and significantly negative Net Present Value. Nevertheless, these units need to be replaced since they are old and past their useful service life.
- An incremental analysis is performed as follows in order to show the economics of installing a high efficiency A/C units instead of standard efficiency units at the Academic Building – Tech Laboratories. See appendix for calculation and details.

Academic Building (Computer Tech Labs) 4 x 7.5 Ton High Efficiency vs Standard A/C Units Incremental Cost and Savings Analysis	
Incremental cost of Each Unit	\$2,000
Total Incremental Cost	\$8,000
Total Incremental Savings	\$770
Simple Payback	10.4

- An incremental analysis for the Administration Air Handling Unit cannot be performed since the Air Handling Unit is connected to campus chilled water and hot water loop. The majority of the estimated savings comes from reduced leakage on this unit.



ECM #14: Domestic Water Heater Replacement

	Academic Building	Service Building	TOTAL
Estimated Annual Savings:	\$463	\$343	\$806
Gross Estimated Implementation Cost:	\$12,600	\$7,800	\$20,400
Approx. NJ Smart Start Rebate:	\$50	\$50	\$100
Net Estimated Implementation Cost:	\$12,550	\$7,750	\$20,300
Simple Payback (years):	27.1	22.6	25.2
Annual Avoided CO ₂ Emissions (tons):	2.6	2.1	4.7

¹ Cost estimates based on vendor quote

² No prescriptive New Jersey Smart Start rebates are available for this measure

- Domestic hot water heaters at Academic Building and Service Building are at end of their ASHRAE useful service life of 15 years and recommended to be replaced new high efficiency, condensing DHW heaters and installing timers on the circulators.
- The timers will turn off the circulators during unoccupied hours. This setback schedule eliminates energy used to make up the pipe heat loss.
- This measure is not recommended for implementation as an energy efficiency project at this time due to its long payback, yet should be considered as an “End of life project”.



ECM #14: Domestic Water Heater Replacement (Cont'd)

Building	Equipment	Quantity	Manufacturer	Model Number	Fuel Type	Input Btu/h	Input Watts	Capacity (gallons)	Replace	Add Timer
Academic Building	DHW	1	A.O Smith	BTC-197	Natural Gas	197,000	N/A	100	Y	Y
Service Building	DHW	1	State	SRX75NQRT60	Natural Gas	75,100	N/A	75	Y	Y

- Basis of the replacement:
 - AO Smith Cyclone BTH-199 High Efficiency Condensing Domestic Water Heater
 - AO Smith Cyclone BTX-100 High Efficiency Condensing Domestic Water Heater

Incremental Analysis

- An incremental analysis is performed as follows in order to show the economics of installing a high efficiency water heaters instead of standard efficiency units. See appendix for calculation and details.

Domestic Water Heater Replacement - High Efficiency vs Standard Efficiency - Incremental Analysis

	Savings kWh	Savings Therms	Savings \$	Incentives	Cost		PB
Academic Building	0	280	\$265	\$50	\$1,732	\$1,682	6.3
Service Building	0	229	\$217	\$50	\$1,430	\$1,380	6.4

Operational and Maintenance Issues

HVAC Systems Scheduling

- Currently HVAC systems in each building has a main schedule that is optimized based on general occupancy schedule of the corresponding building.
- It is recommended to customize the schedule of each HVAC unit (VAV box, heat exchanger etc) based on the occupancy schedule of the corresponding space and routinely update these schedules by establishing a communication platform between the administrators of these spaces (classrooms, offices etc) and the Building Automation System (BAS) operators.

Academic Building

- Currently some of the lower spaces are under renovation. Dome-Tech recommends that new designs are evaluated based on a life cycle analysis.
- Approximately 6' of ½" Un-insulated domestic hot water piping (Electric water heater) .
- Minor leaks on the hot water pump seals.
- Dampers on the mixing boxes may need to be calibrated in the problematic areas

Administration Building

- A portion of this building is currently is being renovated. Dome-Tech recommends that new designs are evaluated based on a life cycle analysis.
- Main air handling unit is in very poor condition with major leaks on the unit as well as the ductwork (See ECM #8).
- Hot water and chilled water piping insulation is deteriorated or missing in various spots in the mechanical room.



Operational and Maintenance Issues (cont'd)

Library

- A portion of this building is currently is being renovated. Dome-Tech recommends that new designs are evaluated based on a life cycle analysis.
- No significant problems observed in this building

Luciano Conference Center

- HVAC and lighting equipment appear to be in excellent condition. No serious problems observed.

Wheaton/Navone Healthcare Center

- HVAC and lighting equipment appear to be in excellent condition. No serious operational or maintenance issues observed.

Service Building

- Several primary chilled water pumps have minor leaks at the seals, which results in small puddles.
- Chimney stack for the original boilers is deteriorated due to corrosion and may need to be replaced soon.
- 300 Ton York chiller is missing insulation on the marine water box, which causes pooling water due to condensation.
- It is recommended to run the Chiller #4 (300 Ton York) and Chiller #5 (375 Ton Carrier) more often since these two are the most efficient chillers in the plant.

Operational and Maintenance Issues (cont'd)

Student Services Building

- Walk-in refrigerator's door will not latch.
- Other HVAC and lighting equipment appear to be in good condition. No serious operational or maintenance issues observed.

University Center

- HVAC and lighting equipment appear to be in good condition. No serious operational or maintenance issues observed.

Energy Sub-metering

- It is strongly recommended to track monthly electricity consumption at each building by using the existing electric sub-meters.
- It is also recommended to install hot water and chilled water flow meters in each building in order to monitor and record total energy consumption of each building.
- Metering total energy at each building provides ability to identify high energy buildings and develop strategies to reduce energy consumption accordingly.
- Energy metering also allows the use of EPA's Energy Star Portfolio Manager, which allows users track consumption and benchmark each building by comparing it to the similar buildings in the same geographical area.

Renewable/Distributed Energy Measures

Distributed Generation & Renewable Energy

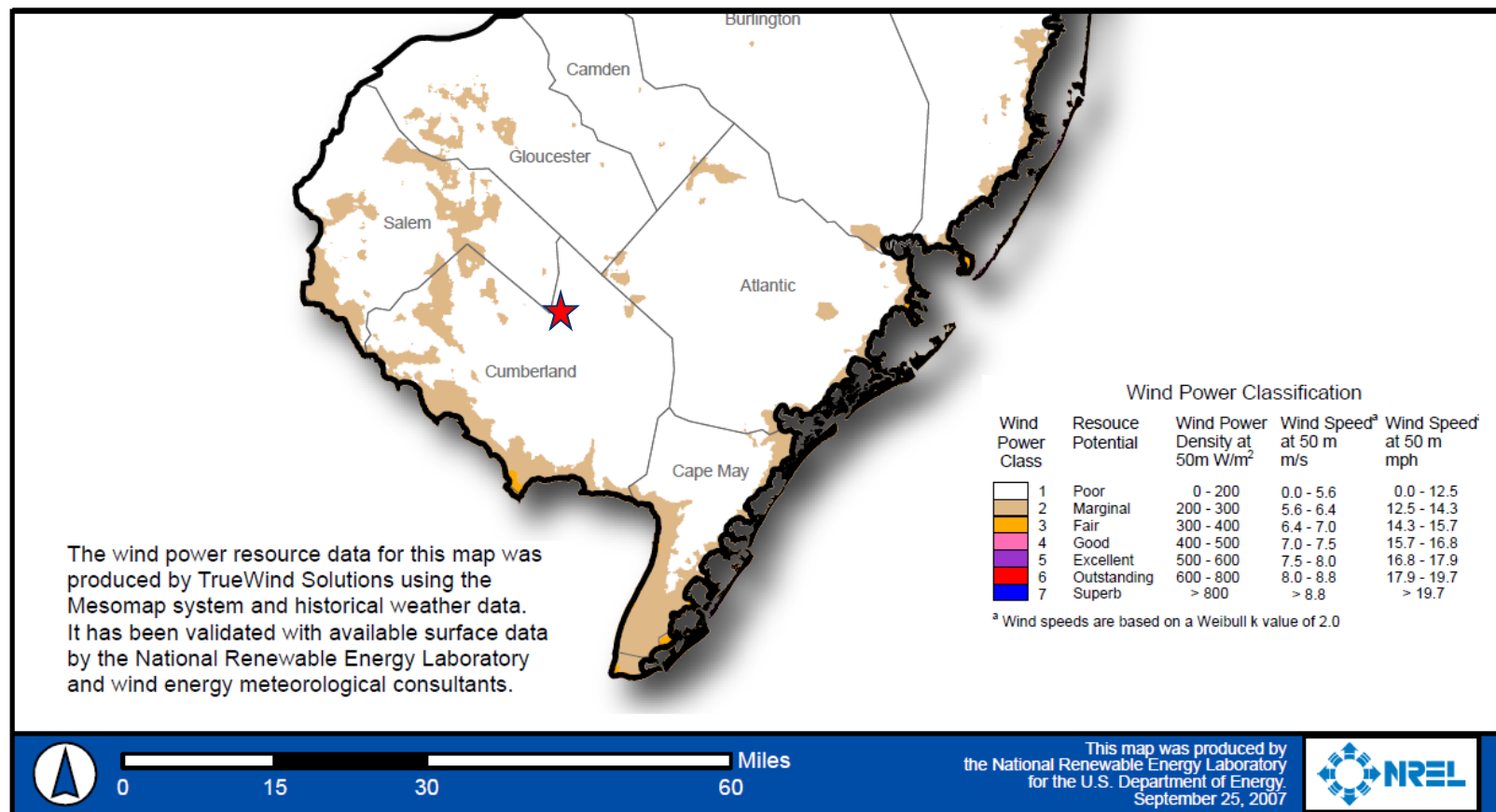
- Distributed Generation (on-site generation) generates electricity from many small energy sources. These sources can be renewable (solar/wind/geothermal) or can be small scale power generation technologies (CHP, fuel cells, microturbines).
- Renewable energy is energy generated from natural resources (sunlight, wind, and underground geothermal heat) which are naturally replenished.

Renewable Energy Technologies: Wind

Wind turbines generate electricity by harnessing a wind stream's kinetic energy as it spins the turbine airfoils. As with most renewable energy sources, wind energy is subject to intermittent performance due to the unpredictability of wind resources.

Vineland, NJ Wind Speed

As previously stated, wind speed is critical to the successful wind turbine installation. According to average wind data from NASA's Surface Meteorology and Solar Energy records, the average annual wind speed for the Vineland area is considered "poor" at **less than 5.6 meters per second** at 50 meters above the surface of the earth. Ideal wind speeds for a successful project should average over **6 meters per second**.





Renewable Energy Technologies: Wind

For Cumberland County College, Dome-Tech considered traditional ground mounted wind turbine (5 kW & 50 kW) technologies. Building integrated wind turbines (1 kW each) are not applicable for this site since the buildings are low and the campus area is heavily wooded.

5 kW Ground Mount

Model: WES5 Tulipo

Height: 40'

Rotor Diameter: 16'

Weight: 1,900 lbs.

Cut-In Wind Speed: 3.0 m/s

Maximum Generating Capacity: 5.2 kW



50 kW Ground Mount

Model: Entegrety EW50

Height: 102'

Rotor Diameter: 50'

Weight: 21,000 lbs.

Cut-In Wind Speed: 4.0 m/s

Maximum Generating Capacity: 50 kW



Renewable Energy Technologies: Wind (cont'd)

The project economics and wind turbine pros and cons are presented in the following tables:

Wind Turbine Economics

	Ground Mounted, 5KW	Ground Mounted, 50 kW
Gross Installation Cost Estimate	\$1,560,000	\$750,000
Number of Units	50	3
Net Installation Cost Estimate	\$1,560,000	\$750,000
Annual Energy Savings	\$38,536	\$43,613
Simple Payback	40	17
System Capacity	250	150
Annual Avoided Energy Use, kWh*	292,835	331,416
% of Annual Electricity Use	4.8%	5.5%

Cumberland County College: 6,069,508 kWh (Annual)

*Calculation based on 5.6 m/s average wind speed

Wind Turbine Pros & Cons

Pros	Cons
➤ Annual reduction in energy spend and use can be potentially reduced by over \$43,600 (5.5% reduction). ➤ Typical equipment life span is 15-30 years. ➤ Reduction of annual greenhouse gas emissions by 117 tons per year. ➤ A wind turbine project could be incorporated into science and other curriculums to raise student awareness of energy alternatives. ➤ High visible "green" project.	➤ Payback period is at least 17.0 years. ➤ Average area wind speed is below minimum requirements. ➤ Prone to lightning strikes. ➤ Bird collisions are likely, but may be reduced with avian guard (building integrate only). ➤ Zoning may be an issue. Check with local zoning regulations. ➤ Wind turbines do create noise, although below 50 dB (a typical car ride is over 80 dB).

Due to a payback of approximately 17.0 years and high potential for energy reduction, three (3) 50 kilowatt ground mounted wind turbine project appears to be the most attractive option. However, since the average area wind speed at 50 meters above ground level is just below the minimum requirement, it does not appear that a wind turbine project would be successful at Cumberland County College. Should the College decide to pursue a wind turbine project, Dome-Tech recommends commissioning a more detailed study.

The New Jersey State Clean Energy Program does not currently provide rebates for small wind system projects.



Renewable Energy Technologies: Solar Photovoltaic

Solar Photovoltaic

- Sunlight can be converted into electricity using photovoltaics (PV).
- A solar cell or photovoltaic cell is a device that converts sunlight directly into electricity.
- Photons in sunlight hit the solar panel and are absorbed by semiconducting materials, such as silicon. Electrons are knocked loose from their atoms, allowing them to flow through the material to produce electricity.
- Solar cells are often electrically connected and encapsulated as a module, in series, creating an additive voltage. The modules are connected in an array. The power output of an array is measured in watts or kilowatts, and typical energy needs are measured in kilowatt-hours.
- This system application can be considered for potential placement on additional buildings or areas such in parking lots, in overhead mounting.



Renewable Energy Technologies: Solar Photovoltaic (cont'd)

Solar Photovoltaic Systems for the Cumberland County College

Building	Academic Building	Conference Center	Navone Health Care	Service Center	Student Center	University Center	Total
Locations to Install Panels	Roof	Roof & Parking Lot	Roof	Roof	Roof	Roof & Parking Lot	
Assumptions							
System Capacity, kW-dc(maximum utilization of roof space)	35	386	66	47	27	305	866
Annual Electric Generation, kWhrs of AC electricity produced	46,832	515,147	88,460	62,442	36,425	406,654	1,155,959
Total Annual Facility Electric Use, kWhrs	1,057,207	513,193	357,414	240,944	648,368	386,885	3,204,009
% of Total Annual Usage	4%	100%	25%	26%	6%	105%	36%
All-In Cost of Electricity Year 1	0.1315	0.1315	0.1315	0.1315	0.1315	0.1315	0.1315
Annual Electric Cost Savings	\$6,158	\$67,742	\$11,632	\$8,211	\$4,790	\$53,475	\$152,009
Estimated SREC Value (Year 1)	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC
Estimated year 1 SREC Revenue	\$4,683	\$51,515	\$8,846	\$6,244	\$3,642	\$40,665	\$115,596
Estimated Total Annual Revenue	\$10,842	\$119,257	\$20,478	\$14,455	\$8,432	\$94,140	\$267,604
Environmental Impact							
Equivalent Annual CO2 Emission Reduction (tons per year)	15.5	170.0	29.2	20.6	12.0	134.2	381.5
Equivalent Cars Removed From Road Annually	3	29	5	4	2	23	66
Equivalent Acres of Tress Planted Annually	4	46	8	6	3	37	104
Financial Results							
System Installed Cost	\$180,000	\$1,930,000	\$330,000	\$230,000	\$140,000	\$1,520,000	\$4,330,000
Simple Payback (Years)	17	16	16	16	17	16	16
IRR (25 Years)	-1%	-1%	0%	0%	-1%	0%	0%
Net Present Value (25 yrs, 4% discount rate)	\$37,761	\$407,798	\$80,942	\$59,964	\$29,370	\$369,238	\$1,040,723
Estimated CO2 Emissions Rate: 0.66 lbs/kWh				Annual Utility Cost Escalation Rate: 3%			
EPA Estimate: 11,560 CO2 per car				Annual system capacity loss: 0.5%			
EPA Estimate:7,333 lbs CO2 per acre of trees planted				Annual maintenance cost: \$12.5/kW			

Solar Photo Voltaic System

➤ Non-Financial Benefits of Solar PV

- The implementation of solar PV projects at Cumberland County College would place your facilities at the forefront of renewable energy utilization. This allows the Cumberland County College the opportunity to not only gain experience with this energy technology, but also to win recognition as an environmentally sensitive, socially conscience institution. Additionally, these projects could be incorporated into science education and additional curriculums to raise awareness of current energy alternatives to the younger generations.
- In spite of the relatively low current utility rates and low REC (Renewable Energy Credit) prices, solar energy appears to be a viable direct investment for this College Campus.
- In addition, the College may consider engaging in a PPA (Power Purchase Agreement) with a solar energy system developer in order to reduce investment risks and operational burdens. Should the College decide to pursue a solar PPA, Dome-Tech recommends commissioning a more detailed study and market analysis.





Renewable Energy Technologies: CHP/Cogeneration

- CHP (combined heat and power) or cogeneration is the use of a heat engine to simultaneously generate both electricity and useful heat.
- Fuel Cells are electrochemical conversion devices that operate by catalysis, separation the protons and the electrons of the reactant fuel, and forcing the electrons to travel through a circuit to produce electricity. The catalyst is typically a platinum group metal or alloy. Another catalytic process takes the electrons back in, combining them with the protons and oxidant, producing waste products (usually water and carbon dioxide).
- Microturbines are rotary engines that extract energy from a flow of combustion gas. They can be used with absorption chillers to provide cooling through waste heat rather than electricity. Microturbines are best suited for facilities with year-round thermal and/or cooling loads.
- Since the Cumberland County College has a year round demand for heat, a CHP system is a viable option to reduce grid purchased energy consumption, demand and overall carbon footprint.



Renewable Energy Technologies: CHP/Cogeneration (Cont'd)

- **Microturbine Cogeneration System Economics**
- Four (4) 65 kW Microturbines will generate electricity and hot water.
- Hot water will be utilized for space heating in winter and reheat for the HVAC systems in the summer.

CHP/COGENERATION FEASIBILITY ANALYSIS		
<u>Simple Payback</u>		
Total Installed Cost	\$3,000 /kW	\$780,000
State Grant	\$1,000 /kW	(\$260,000)
Federal Investment Tax Credit	\$0 /kW	\$0
Net Installed Cost		\$520,000
<u>Year 1 Annual Savings</u>		
Avoided Electric Energy:	1,664,400 kWh	\$219,035
Avoided Heating Fuel:	14,564 MMBTU	\$138,047
Avoided Cooling:	0 kWh	\$0
CHP Gas:	25,532 MMBTU	(\$204,255)
Service Contract:	2.7 ¢/kWh	(\$44,939)
Net Annual Savings (Year 1)		\$107,888
Simple Payback		4.8

NOTE: The presented economics should be used for planning purposes only. If the client decides to proceed with a microturbine project, these economics should be refined with an investment grade analysis.



Retail Energy Purchasing: Recommendations and Resources

Electric

- The campus has two separate electricity services from two different utility companies: Vineland Municipal Electric Utility and Atlantic City Electricity.
- For the period studied, the campus was utilizing HESS as a Third Party Supplier for electricity that it received from Atlantic City Electricity. The College is on a fixed rate of \$0.0869 per kWh. Supplier contracts were not available therefore Dome-Tech was unable to include further contract details in this report. For the same period, Vineland Municipal Electric Utility provided both supply and delivery of the electricity. The College is on a market rate of approximately \$0.080 per kWh.
- Dome-Tech recommends the College evaluate their current purchasing activities. It is recommended to explore a new procurement strategy for the electricity received from Vineland Municipal Electric Utility.

Natural Gas

- The College has four (4) separate natural gas services, one of which is the main service connected to the Central Plant. For the period studied, the campus was utilizing Hess as a Third Party Supplier for the main natural gas supply. The gas was billed at a fixed rate \$0.541/Therm. Supplier contracts were not provided therefore Dome-Tech was unable to include contract details in this report.
- The remaining smaller services were billed at market rate by the South Jersey Gas Utility Company.
- It is recommended that the College evaluate their current purchasing activities. Based on information received, the College is locked into a fixed price contract with HESS.

Energy Purchasing Co-Operatives

- Many public entities participate in various energy aggregation buying groups. Sometimes, an entity will have multiple options to choose from. These might include purchasing through a County co-operative, or purchasing through a trade-type association like ACES. Co-operative purchasing may not necessarily provide you with the lowest rates; however, there is often substantial volume, and it can represent a good alternative for entities with limited energy consumption who can have a difficult time getting energy suppliers to respond to them on a direct, singular basis.



Retail Energy Purchasing: Recommendations and Resources (cont'd)

- To learn more about energy deregulation, visit the New Jersey Board of Public Utilities website: www.bpu.state.nj.us
- For more information about the retail energy supply companies that are licensed and registered to serve customers in New Jersey, visit the following website for more information: <http://www.bpu.state.nj.us/bpu/commercial/shopping.html>
- Provided below is a list of NJ BPU-licensed retail energy suppliers:

Company	Electricity	Natural Gas	Website
Hess	X	X	hess.com
Sprague	X	X	spragueenergy.com
UGI	X	X	ugienergyservices.com
South Jersey Energy	X	X	southjerseyenergy.com
Direct	X	X	directenergy.com
Global	X	X	globalp.com
Liberty	X		libertypowercorp.com
Reliant / NRG	X		reliant.com
First Energy	X		fes.com
ConEd Solutions	X		conedsolutions.com
Constellation / Exelon	X	X	newenergy.com
Glacial	X		glacialenergy.com
Integrus	X		integrusenergy.com
Suez	X		suezenergyresources.com
Sempra	X		semprasolutions.com
Woodruff		X	woodruffenergy.com
NextEra	X		mxenergy.com
Hudson		X	hudsonenergyservices.com
Great Eastern		X	greateasterngas.com

**Note: Not every Supplier serves customers in all utility territories within New Jersey.
Please refer to the BPU website for current supplier list.*

Utility Tariff and Rate Review: Electricity

- **Accounts and Rate Class:** The Cumberland County College has eight facilities included in this study. There are two (2) main electric services for these facilities.
- The electricity services are provided by Atlantic City Electricity and Vineland Municipal Electric Utility under General Service 3-phase rate classes.
- **Electric Consumption and Cost:** Based on the one-year period studied, the total annual electric expenditure for the Entire Campus is about \$798,719 and the total annual consumption is about 6,069,508 kilowatt-hours (kWh).
- **Average/Effective Rate per kWh:** For the one year period studied, the College's average monthly cost per kilowatt-hour ranged from 12.92¢/kWh to 13.41¢/kWh, inclusive of utility delivery charges. The Campus overall, average cost per kilowatt-hour during this period was 13.18¢/kWh.
 - *Note that these average electric rates are "all-inclusive"; that is, they include all supply service (generation and commodity-related) charges, as well as all delivery service charges. The supply service charges typically represent the majority (60-80%) of the total monthly bill. It is the supply portion of your bill that is deregulated, which is discussed on subsequent slides in this section.*

Utility Tariff and Rate Review: Natural Gas

- **Accounts and Rate Class:** The Cumberland County College has eight facilities included in this study. There are four (4) gas services for these facilities. Main service is connected to the Central Plant, which provides heating hot water for the entire campus. The remaining meters have minuscule usage. The gas services are provided by South Jersey Gas company under BSC rate class with Firm Transportation.
- **Natural Gas Consumption and Cost:** Based on the one-year period studied, the total annual natural gas expenditure for the Entire Campus is about \$260,205 and the total annual consumption is about 265,814 therms. The eight facilities in this report used approximately 166,000 Therms,, which is interpolated based on total area of each building and the campus. Natural Gas is used year round for space heating in winter and HVAC reheat in the summer.
- **Average/Effective Rate per Therm:** For the one year period studied, the Campus's overall, average cost for \$0.979 per therm.
 - *Note that these average electric rates are “all-inclusive”; that is, they include all supply service (generation and commodity-related) charges, as well as all delivery service charges. The supply service charges typically represent the majority (60-80%) of the total monthly bill. It is the supply portion of your bill that is deregulated, which is discussed on subsequent slides in this section.*



Utility Deregulation in New Jersey: Background and Retail Energy Purchasing

➤ Electric Accounts:

- In August 2003, per the Electric Discount and Energy Competition Act [N.J.S.A. 48:3-49], the State of New Jersey deregulated its electric marketplace thus making it possible for customers to shop for a third-party (someone other than the utility) supplier of retail electricity.
- Per this process, every single electric account for every customer in New Jersey was placed into one of two categories: "BGS-FP" or "BGS-CIEP". BGS-FP stands for Basic Generation Service-Fixed Price; BGS-CIEP stands for Basic Generation Service-Commercial and Industrial Energy Pricing.
- At its first pass, this categorization of accounts was based on rate class. The largest electric accounts in the State (those served under a Primary or a Transmission-level rate class) were moved into BGS-CIEP pricing. All other accounts (the vast majority of accounts in the State of New Jersey, including residential) were placed in the BGS-FP category, receiving default electric supply service from the utility.
- The New Jersey Board of Public Utilities (NJBPU) has continued to move new large energy users from the BGS-FP category into the BGS-CIEP category by lowering the demand (kW) threshold for electric accounts receiving Secondary service. Originally, this threshold started at 1,500kW; now, it has come down to 750 kW. So, if an account's "peak load contribution" (as assigned by the utility) is less than 750 kW, then that facility/account is in the BGS-FP category. If you are unsure, you may contact Dome-Tech for assistance.



Utility Deregulation in New Jersey: Background and Retail Energy Purchasing (cont'd)

- There are at least 3 important differentiating factors to note about each rate category:
 1. The rate structure for BGS-FP accounts is different than the rate structure for BGS-CIEP accounts.
 2. The “do-nothing” option (i.e., what happens when you don’t shop for retail energy) varies.
 3. The decision about whether, and why, to shop for a retail provider varies.

- **BGS-FP: Secondary (small to medium) Electric Accounts:**

- BGS-FP rate schedules for all utilities are set, and re-set, each year. Per the results of our State’s BGS Auction process, held each February, new utility default rates go into effect every year on June 1st. The BGS-FP rates become each customer’s default rates, and they dictate a customer’s “Price to Compare” (benchmark) for shopping purposes. To learn more about the BGS Auction process, please go to www.bgs-auction.com.
- A customer’s decision about whether to buy energy from a retail energy supplier is, therefore, predominantly dependent upon whether a supplier can offer rates that are lower than the utility’s (default) Price to Compare.

- **BGS-CIEP: Primary (large) Electric Accounts:**

- The BGS-CIEP category is quite different. These accounts pay an hourly market rate for energy when they do not switch to a retail provider.
- For BGS-CIEP accounts, the process of setting forth a buying strategy can be complex, which is why many public entities seek professional assistance when shopping for energy.
- For more information concerning hourly electric market prices for our region, please refer to www.pjm.com.



Utility Deregulation in New Jersey: Background and Retail Energy Purchasing (cont'd)

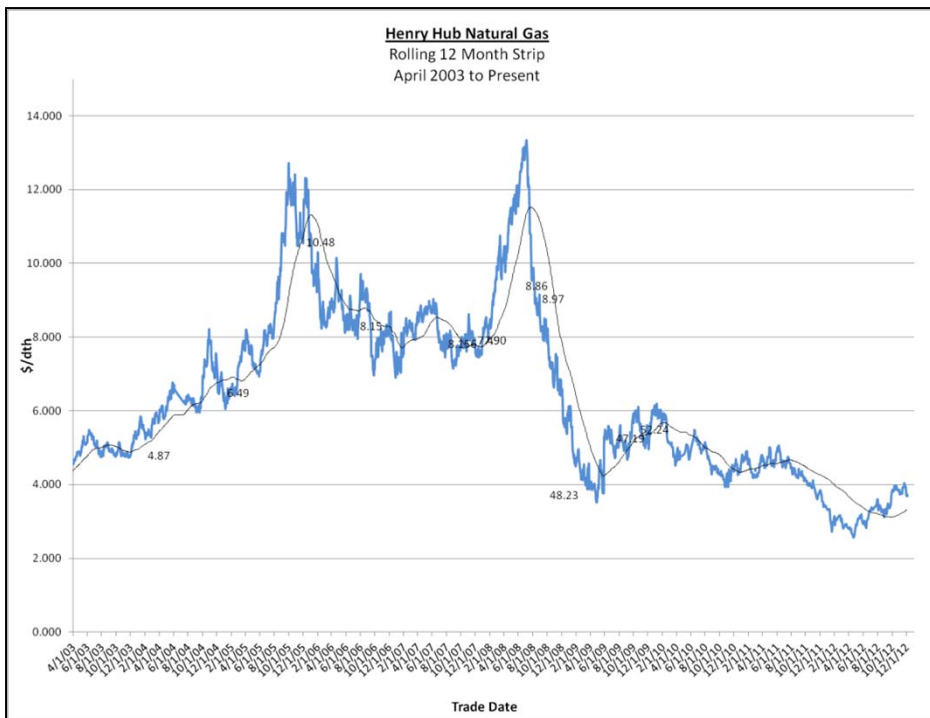
➤ **Natural Gas Accounts:**

- The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate on a monthly basis. While natural gas is a commodity that is exceptionally volatile and that is traded minute-by-minute during open trading sessions, market rates are “settled” monthly, 3 business days prior to the subsequent month (this is called the “prompt month”). Customers that do not shop for a natural gas supplier will typically pay this monthly settlement rate to the utility, plus other costs that are necessary to bring gas from Louisiana (The “Henry Hub”) up to New Jersey (at the “City Gate”) and ultimately to your facility.
- For additional information about natural gas trading and current market futures rates for various commodities, you can refer to www.nymex.com.
- 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 enlisting a retail natural gas supplier. Many larger natural gas customers also seek the assistance of a professional consultant to assist in their procurement process.

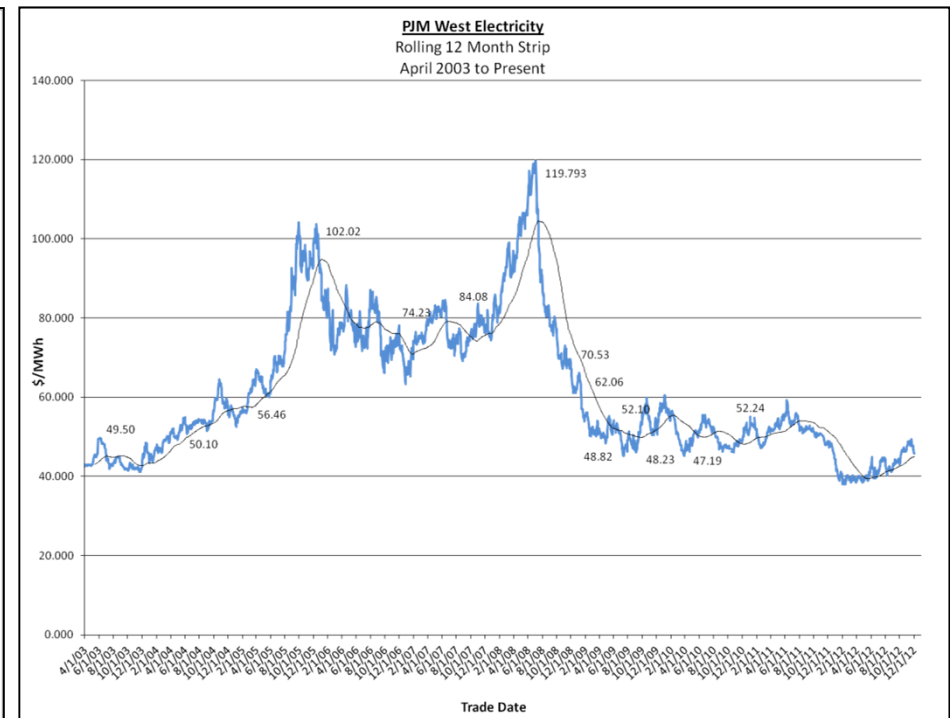
Historical Energy Futures Settlement Prices

Below please find graphs that show the last ten years' worth of market settlement prices for both natural gas and electricity. Each of these graphs shows the average closing prices of a rolling 12-month period of energy futures prices. The graphs are representative of the commodity, alone; they do not include any of the additional components (capacity, transmission, ancillary services, etc.) that comprise a retail energy price. They are meant to provide an indication of the level of pricing that a particular customer might expect to see, but the graphs do not account for the specific load profile of any individual energy user.

Natural Gas



Electricity



Potential Project Funding Sources

Through the NJ Clean Energy Program, the New Jersey Board of Public Utilities currently offers a variety of subsidies or rebates for many of the project types outlined in this report. More detailed information can be found at: www.njcleanenergy.com

- **NJ Smart Start Buildings** – Equipment Rebates noted in ECMs where available.
Equipment Rebates: Water Heaters, Lighting, Lighting Controls/Sensors, Chillers, Boilers, Heat Pumps, Air Conditioners, Energy Management, Systems/Building Controls, Motor-ASDs/VSDs, Custom/Others.
<http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings>
- **Pay for Performance Program** – Performance-Based Incentives for installations. Provides incentives of up to \$0.11/ kWh and \$1.25/ therm saved; up to 25% of total project cost. A minimum reduction target of 15% compared to baseline must be achieved. Energy modeling of building and systems and energy reduction plan is required (incentives provided to pay for part of study costs).
<http://www.njcleanenergy.com/commercial-industrial/programs/pay-performance/existing-buildings>
- **Energy Savings Improvement Program (ESIP)** – Public entities can contract with energy saving companies (ESCO) in up to 20-year lease purchases enabling public entities to implement energy conservation measures at their facilities, and pay for the costs using the value of energy savings that result from the improvements. A “Do It Yourself” approach allows the public entity to contract with an engineering firm(s) to develop an Energy Savings Plan, develop plans and specs, oversee construction, commissioning, etc. (No ESCO is needed for the Do It Yourself approach).
<http://www.njcleanenergy.com/commercial-industrial/programs/energy-savings-improvement-program>

Potential Project Funding Sources (cont'd)

- **Direct Install Program** – NJ Clean Energy makes the investment in energy efficiency upgrades by initially covering 70% of the cost to install the recommended energy efficiency measures (up to \$75,000 per project). If eligible, the entity will pay ONLY 30% of the total cost to install the energy efficiency measures.

<http://www.njcleanenergy.com/commercial-industrial/programs/direct-install>

We encourage you to contact the program directly for further information

Steps to Participate for Buildings:

1. **CONTACT THE PARTICIPATING CONTRACTOR IN YOUR AREA**

Identify the contractor assigned and trained to provide Direct Install services in the county where your project is located. Using the contact information provided, call or email the Participating Contractor to discuss your project. The contractor will schedule an Energy Assessment and work with you to complete the Program Application and Participation Agreement. If you're unable to contact the Participating Contractor or have questions, you may contact us at 866-NJSMART or send an e-mail to DirectInstall@trcsolutions.com.

2. **REVIEW RESULTS**

After the Energy Assessment, the contractor will review results with you, including what measures qualify and your share of the project cost.

3. **DECIDE TO MOVE FORWARD**

You will sign a Scope of Work document to proceed with implementation of qualifying measures.

4. **ARRANGE INSTALLATION**

You and the Participating Contractor will set a convenient start date for the installation.

5. **CONFIRM INSTALLATION**

Once the Participating Contractor completes the installation, you accept the work by signing a Project Completion Form. A program representative will approve the project as complete.

6. **COMPLETE TRANSACTION**

You pay the Participating Contractor your share of the project cost and the program pays its share.

Next Steps

➤ **The following projects should be considered for implementation:**

- Address Operation and Maintenance Issues
- Domestic Water Heater Timers
- Computer Power Management System
- Lighting Equipment and Controls Upgrade
- Chiller Plant Optimization
- Rooftop Unit Fuel Switch
- Daylight Harvesting
- Variable Frequency Drives and 2-way Valves
- Solar PV Panels
- Combined Heat and Power

Note that additional “Phase 2” engineering may be required to further develop these projects, to bring them to bidding and implementation.

➤ **Consider applying for Pay-For-Performance Program or Energy Savings Improvement Program**

(Page left blank intentionally)



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

PORTFOLIO MANAGER / ENERGY STAR

(Page left blank intentionally)



ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Academic Building

Primary Function: College/University
Gross Floor Area (ft²): 47,818
Built: 1965

For Year Ending: 06/30/2013
Date Generated: 08/17/2013

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

Property & Contact Information

Property Address

Academic Building
3322 College Dr.
Vineland, New Jersey 08362

Property ID: 3642143

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Academic Building

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: College/University

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

3322 College Dr.
Vineland, New Jersey 08362

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 47,818 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 100

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

College/University: Building Use

1) Gross Floor Area: 47,818

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) Weekly Operating Hours: 12

Is this the total number of hours per week that the property is occupied by the majority of the employees? It does not include hours when the property is occupied only by maintenance, security, or other support personnel. The Weekly Operating Hours is not the same as the hours during which the HVAC equipment is run, but rather should be based on the hours during which your property is actually occupied by the majority of the tenants. For properties with a schedule that varies during the year, Weekly Operating Hours refers to the schedule most often followed.

☐ Yes ☐ No

3) Enrollment: 400

Is this the total student enrollment for the year (i.e. number of students)?

☐ Yes ☐ No

4) Number of Full Time Equivalent (FTE) Workers: Not entered

Is this the total number of hours worked by all workers in a week divided by the standard hours worked by one full time worker in a week? Workers may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Workers should not include visitors to the property such as clients, customers, or patients.

☐ Yes ☐ No

5) Number of Computers: 320

Is this the total number of computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment.

☐ Yes ☐ No

6) Grant Dollars: Not entered

Is this the annual amount of grant dollars received by the college/university?

☐ Yes ☐ No

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu)	3,600,638.7 (43.4%)
Natural Gas (kBtu)	4,705,332 (56.6%)
Total Energy (kBtu)	8,305,970.6

National Median Comparison

National Median Site EUI (kBtu/ft ²)	134.2
National Median Source EUI (kBtu/ft ²)	262.6
% Diff from National Median Source EUI	29.43%

Energy Intensity

Site (kBtu/ft ²)	173.7	Emissions (based on site energy use)	
Source (kBtu/ft ²)	339.8	Greenhouse Gas Emissions ()	705.7

Power Generation Plant or Distribution Utility:
Vineland NJ (City of)

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Natural Gas	Natural Gas	06/11/2012	In Use	Academic Building
Electric Grid Meter	Electric	06/11/2012	In Use	Academic Building
Natural Gas - Shared	Natural Gas	06/11/2012	In Use	Academic Building

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels

☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy

☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Natural Gas Meter: Natural Gas (therms)

Associated With: Academic Building

Start Date	End Date	Usage
06/11/2012	07/11/2012	17.75
07/12/2012	08/13/2012	28.24
08/14/2012	09/13/2012	11.53
09/14/2012	10/15/2012	49.92
10/16/2012	11/09/2012	47.66
11/10/2012	12/12/2012	120.76
12/13/2012	01/11/2013	0
01/12/2013	02/11/2013	29.18
02/12/2013	03/13/2013	59.28
03/14/2013	04/12/2013	43.76
04/13/2013	05/09/2013	265.46
05/10/2013	06/10/2013	79.42
06/11/2013	07/11/2013	17.75 ← estimate
Total Consumption (therms):		770.71
Total Consumption (kBtu (thousand Btu)):		77,071

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Academic Building

Start Date	End Date	Usage	Green Power?
06/12/2012	07/12/2012	93,962.44 ← estimate	No
07/12/2012	08/13/2012	100,415.9 ← estimate	No
08/13/2012	09/12/2012	95,124.06 ← estimate	No
09/12/2012	10/10/2012	82,217.13 ← estimate	No
10/10/2012	11/12/2012	91,897.33 ← estimate	No
11/12/2012	12/10/2012	77,570.64 ← estimate	No
12/10/2012	01/11/2013	80,281.1 ← estimate	No
01/11/2013	02/12/2013	90,864.78 ← estimate	No

Start Date	End Date	Usage	Green Power?
02/12/2013	03/11/2013	77,957.85 ← estimate	No
03/11/2013	04/09/2013	82,475.27 ← estimate	No
04/09/2013	05/09/2013	90,735.71 ← estimate	No
05/09/2013	06/11/2013	93,704.3 ← estimate	No
06/12/2013	07/12/2013	93,962.44 ← estimate	No
Total Consumption (kWh (thousand Watt-hours)):			1,151,168.95
Total Consumption (kBtu (thousand Btu)):			3,927,788.5

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas - Shared (therms)		
Associated With: Academic Building		
Start Date	End Date	Usage
06/11/2012	07/11/2012	2,227.63 ← estimate
07/12/2012	08/13/2012	2,288.38 ← estimate
08/14/2012	09/13/2012	2,519.11 ← estimate
09/14/2012	10/15/2012	3,516.13 ← estimate
10/16/2012	11/09/2012	3,648.78 ← estimate
11/10/2012	12/12/2012	5,969.21 ← estimate
12/13/2012	01/11/2013	3,951.07 ← estimate
01/12/2013	02/11/2013	5,958.61 ← estimate
02/12/2013	03/13/2013	4,965.34 ← estimate
03/14/2013	04/12/2013	5,564.76 ← estimate
04/13/2013	05/09/2013	2,491.4 ← estimate
05/10/2013	06/10/2013	3,199.94 ← estimate
06/11/2013	07/11/2013	2,227.63 ← estimate
Total Consumption (therms):		48,527.99

Total Consumption (kBtu (thousand Btu)):	4,852,799
Total Energy Consumption for this Meter ☐ Yes ☐ No Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?	
Notes:	

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

Ersin Gercek
 205 Route 46
 Suite 12
 Totowa, NJ 07512
 9738376066
 egercek@real-eng.com



NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



LEARN MORE AT
energystar.gov

ENERGY STAR® Statement of Energy Performance

N/A

Academic Building

Primary Property Function: College/University

Gross Floor Area (ft²): 47,818

Built: 1965

**ENERGY STAR®
Score¹**

For Year Ending: June 30, 2013

Date Generated: August 17, 2013

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

Academic Building
3322 College Dr.
Vineland, New Jersey 08362

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

Property ID: 3642143

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

173.7 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	3,600,639 (43%)
Natural Gas (kBtu)	4,705,332 (57%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	134.2
National Median Source EUI (kBtu/ft²)	262.6
% Diff from National Median Source EUI	29%

Source EUI

339.8 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (MtCO2e/year)	706
--	-----

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

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



**Professional Engineer Stamp
(if applicable)**



ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Administration Building

Primary Function: College/University
Gross Floor Area (ft²): 9,202
Built: 1965

For Year Ending: 06/30/2013
Date Generated: 08/17/2013

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

Property & Contact Information

Property Address

Administration Building
3322 College Dr.
Vineland, New Jersey 08360

Property ID: 3642185

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Administration Building

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: College/University

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

3322 College Dr.
Vineland, New Jersey 08360

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 9,202 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 100

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

College/University: Building Use

1) Gross Floor Area: 9,202

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) Weekly Operating Hours: 70

Is this the total number of hours per week that the property is occupied by the majority of the employees? It does not include hours when the property is occupied only by maintenance, security, or other support personnel. The Weekly Operating Hours is not the same as the hours during which the HVAC equipment is run, but rather should be based on the hours during which your property is actually occupied by the majority of the tenants. For properties with a schedule that varies during the year, Weekly Operating Hours refers to the schedule most often followed.

☐ Yes ☐ No

3) Enrollment: Not entered

Is this the total student enrollment for the year (i.e. number of students)?

☐ Yes ☐ No

4) Number of Full Time Equivalent (FTE) Workers: Not entered

Is this the total number of hours worked by all workers in a week divided by the standard hours worked by one full time worker in a week? Workers may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Workers should not include visitors to the property such as clients, customers, or patients.

☐ Yes ☐ No

5) Number of Computers: 34

Is this the total number of computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment.

☐ Yes ☐ No

6) Grant Dollars: Not entered

Is this the annual amount of grant dollars received by the college/university?

☐ Yes ☐ No

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu)	685,851.7 (43.5%)
Natural Gas (kBtu)	890,994.1 (56.5%)
Total Energy (kBtu)	1,576,845.8

National Median Comparison

National Median Site EUI (kBtu/ft ²)	134.1
National Median Source EUI (kBtu/ft ²)	262.6
% Diff from National Median Source EUI	27.82%

Energy Intensity

Site (kBtu/ft ²)	171.4	Emissions (based on site energy use)	
Source (kBtu/ft ²)	335.7	Greenhouse Gas Emissions ()	134.2

Power Generation Plant or Distribution Utility:
Vineland NJ (City of)

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Electric Meter - Shared	Electric	06/11/2012	In Use	Administration Building
Natural Gas - Shared	Natural Gas	06/11/2012	In Use	Administration Building

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels

☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy

☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric Meter: Electric Meter - Shared (kWh (thousand Watt-hours))

Associated With: Administration Building

Start Date	End Date	Usage	Green Power?
06/26/2012	07/29/2012	27,989.66 ⚡ estimate	No
07/29/2012	08/27/2012	25,838.38 ⚡ estimate	No
08/27/2012	09/27/2012	23,729.86 ⚡ estimate	No
09/27/2012	10/28/2012	19,910.72 ⚡ estimate	No
10/28/2012	11/28/2012	12,183.35 ⚡ estimate	No
11/28/2012	12/27/2012	10,566.68 ⚡ estimate	No
12/27/2012	01/27/2013	10,189.1 ⚡ estimate	No
01/27/2013	02/26/2013	10,819 ⚡ estimate	No
02/26/2013	03/27/2013	10,025.48 ⚡ estimate	No
03/27/2013	04/28/2013	14,865.68 ⚡ estimate	No
04/28/2013	05/28/2013	17,342.21 ⚡ estimate	No
05/29/2013	06/28/2013	19,986.59 ⚡ estimate	No
06/29/2013	07/29/2013	27,989.66 ⚡ estimate	No
Total Consumption (kWh (thousand Watt-hours)):			231,436.37
Total Consumption (kBtu (thousand Btu)):			789,660.9

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas - Shared (therms)

Associated With: Administration Building

Start Date	End Date	Usage
06/11/2012	07/11/2012	428.68 ⚡ estimate
07/12/2012	08/13/2012	440.37 ⚡ estimate
08/14/2012	09/13/2012	484.77 ⚡ estimate
09/14/2012	10/15/2012	676.64 ⚡ estimate
10/16/2012	11/09/2012	702.16 ⚡ estimate
11/10/2012	12/12/2012	1,148.7 ⚡ estimate
12/13/2012	01/11/2013	760.34 ⚡ estimate

Start Date	End Date	Usage
01/12/2013	02/11/2013	1,146.66 ← estimate
02/12/2013	03/13/2013	955.52 ← estimate
03/14/2013	04/12/2013	1,070.87 ← estimate
04/13/2013	05/09/2013	479.44 ← estimate
05/10/2013	06/10/2013	615.79 ← estimate
06/11/2013	07/11/2013	428.68 ← estimate
Total Consumption (therms):		9,338.62
Total Consumption (kBtu (thousand Btu)):		933,862

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp



LEARN MORE AT
energystar.gov

ENERGY STAR® Statement of Energy Performance

N/A

Administration Building

Primary Property Function: College/University

Gross Floor Area (ft²): 9,202

Built: 1965

**ENERGY STAR®
Score¹**

For Year Ending: June 30, 2013

Date Generated: August 17, 2013

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

Administration Building
3322 College Dr.
Vineland, New Jersey 08360

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

Property ID: 3642185

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

171.4 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	685,852 (43%)
Natural Gas (kBtu)	890,994 (57%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	134.1
National Median Source EUI (kBtu/ft²)	262.6
% Diff from National Median Source EUI	28%

Source EUI

335.7 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (MtCO2e/year)	134
--	-----

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

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



**Professional Engineer Stamp
(if applicable)**



ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Library Distance Learning Center

Primary Function: College/University
Gross Floor Area (ft²): 17,590
Built: 1965

For Year Ending: 06/30/2013
Date Generated: 08/17/2013

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

Property & Contact Information

Property Address

Library Distance Learning Center
3322 College Dr.
Vineland,, New Jersey 08360

Property ID: 3644266

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Library Distance Learning Center

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: College/University

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

3322 College Dr.
Vineland,, New Jersey 08360

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 17,590 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 100

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

College/University: Building Use

1) Gross Floor Area: 17,590

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) Weekly Operating Hours: 50

Is this the total number of hours per week that the property is occupied by the majority of the employees? It does not include hours when the property is occupied only by maintenance, security, or other support personnel. The Weekly Operating Hours is not the same as the hours during which the HVAC equipment is run, but rather should be based on the hours during which your property is actually occupied by the majority of the tenants. For properties with a schedule that varies during the year, Weekly Operating Hours refers to the schedule most often followed.

☐ Yes ☐ No

3) Enrollment: Not entered

Is this the total student enrollment for the year (i.e. number of students)?

☐ Yes ☐ No

4) Number of Full Time Equivalent (FTE) Workers: Not entered

Is this the total number of hours worked by all workers in a week divided by the standard hours worked by one full time worker in a week? Workers may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Workers should not include visitors to the property such as clients, customers, or patients.

☐ Yes ☐ No

5) Number of Computers: 118

Is this the total number of computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment.

☐ Yes ☐ No

6) Grant Dollars: Not entered

Is this the annual amount of grant dollars received by the college/university?

☐ Yes ☐ No

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu)	1,326,991 (43.8%)
Natural Gas (kBtu)	1,703,268 (56.2%)
Total Energy (kBtu)	3,030,259

National Median Comparison

National Median Site EUI (kBtu/ft ²)	133.6
National Median Source EUI (kBtu/ft ²)	262.6
% Diff from National Median Source EUI	28.97%

Energy Intensity

Site (kBtu/ft ²)	172.3	Emissions (based on site energy use)	
Source (kBtu/ft ²)	338.6	Greenhouse Gas Emissions ()	258.4

Power Generation Plant or Distribution Utility:
Vineland NJ (City of)

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Natural Gas - Shared	Natural Gas	06/11/2012	In Use	Library Distance Learning Center
Electric - Shared	Electric	05/28/0012	In Use	Library Distance Learning Center

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels

☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy

☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Natural Gas Meter: Natural Gas - Shared (therms)

Associated With: Library Distance Learning Center

Start Date	End Date	Usage
06/11/2012	07/11/2012	819.49 ← estimate
07/12/2012	08/13/2012	841.83 ← estimate
08/14/2012	09/13/2012	926.71 ← estimate
09/14/2012	10/15/2012	1,293.49 ← estimate
10/16/2012	11/09/2012	1,342.29 ← estimate
11/10/2012	12/12/2012	2,195.92 ← estimate
12/13/2012	01/11/2013	1,453.49 ← estimate
01/12/2013	02/11/2013	2,192.02 ← estimate
02/12/2013	03/13/2013	1,826.62 ← estimate
03/14/2013	04/12/2013	2,047.13 ← estimate
04/13/2013	05/09/2013	916.52 ← estimate
05/10/2013	06/10/2013	1,177.17 ← estimate
06/11/2013	07/11/2013	819.49 ← estimate
Total Consumption (therms):		17,852.17
Total Consumption (kBtu (thousand Btu)):		1,785,217

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric Meter: Electric - Shared (kWh (thousand Watt-hours))

Associated With: Library Distance Learning Center

Start Date	End Date	Usage	Green Power?
06/12/2012	07/12/2012	38,207.35 ← estimate	No
07/13/2012	08/13/2012	53,506.42 ← estimate	No
08/14/2012	09/12/2012	49,393.94 ← estimate	No
09/13/2012	10/10/2012	45,363.17 ← estimate	No
10/11/2012	11/12/2012	38,062.32 ← estimate	No
11/13/2012	12/10/2012	23,290.29 ← estimate	No
12/11/2012	01/11/2013	20,199.79 ← estimate	No
01/12/2013	02/12/2013	19,477.98 ← estimate	No

Start Date	End Date	Usage	Green Power?
02/13/2013	03/11/2013	20,682.14 ← estimate	No
03/12/2013	04/09/2013	19,165.21 ← estimate	No
04/10/2013	05/09/2013	28,417.97 ← estimate	No
05/10/2013	06/11/2013	33,152.24 ← estimate	No
06/12/2013	07/12/2013	38,207.35 ← estimate	No
Total Consumption (kWh (thousand Watt-hours)):			427,126.17
Total Consumption (kBtu (thousand Btu)):			1,457,354.5

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp



LEARN MORE AT
energystar.gov

ENERGY STAR® Statement of Energy Performance

N/A

Library Distance Learning Center

Primary Property Function: College/University

Gross Floor Area (ft²): 17,590

Built: 1965

**ENERGY STAR®
Score¹**

For Year Ending: June 30, 2013

Date Generated: August 17, 2013

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

Library Distance Learning Center
3322 College Dr.
Vineland, New Jersey 08360

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

Property ID: 3644266

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

172.3 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	1,326,991 (44%)
Natural Gas (kBtu)	1,703,268 (56%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	133.6
National Median Source EUI (kBtu/ft²)	262.6
% Diff from National Median Source EUI	29%

Source EUI

338.6 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (MtCO2e/year)	258
--	-----

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

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



**Professional Engineer Stamp
(if applicable)**



ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Luciano Conference Center

Primary Function: College/University
Gross Floor Area (ft²): 23,212
Built: 2005

For Year Ending: 06/30/2013
Date Generated: 08/17/2013

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

Property & Contact Information

Property Address

Luciano Conference Center
3322 College Dr.
Vineland, New Jersey 08360

Property ID: 3644269

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Luciano Conference Center

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: College/University

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

3322 College Dr.
Vineland, New Jersey 08360

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 23,212 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 100

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

College/University: Building Use

1) Gross Floor Area: 23,212

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) Weekly Operating Hours: 60

Is this the total number of hours per week that the property is occupied by the majority of the employees? It does not include hours when the property is occupied only by maintenance, security, or other support personnel. The Weekly Operating Hours is not the same as the hours during which the HVAC equipment is run, but rather should be based on the hours during which your property is actually occupied by the majority of the tenants. For properties with a schedule that varies during the year, Weekly Operating Hours refers to the schedule most often followed.

☐ Yes ☐ No

3) Enrollment: Not entered

Is this the total student enrollment for the year (i.e. number of students)?

☐ Yes ☐ No

4) Number of Full Time Equivalent (FTE) Workers: Not entered

Is this the total number of hours worked by all workers in a week divided by the standard hours worked by one full time worker in a week? Workers may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Workers should not include visitors to the property such as clients, customers, or patients.

☐ Yes ☐ No

5) Number of Computers: 27

Is this the total number of computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment.

☐ Yes ☐ No

6) Grant Dollars: Not entered

Is this the annual amount of grant dollars received by the college/university?

☐ Yes ☐ No

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu)	1,751,015.5 (41.1%)
Natural Gas (kBtu)	2,506,032 (58.9%)
Total Energy (kBtu)	4,257,047.5

National Median Comparison

National Median Site EUI (kBtu/ft ²)	137.5
National Median Source EUI (kBtu/ft ²)	262.6
% Diff from National Median Source EUI	33.38%

Energy Intensity

Site (kBtu/ft ²)	183.4	Emissions (based on site energy use)	
Source (kBtu/ft ²)	350.2	Greenhouse Gas Emissions ()	354.7

Power Generation Plant or Distribution Utility:
Vineland NJ (City of)

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Natural Gas DHW	Natural Gas	06/11/2012	In Use	Luciano Conference Center
Natural Gas Shared	Natural Gas	06/11/2012	In Use	Luciano Conference Center
Electric Shared	Electric	05/28/0012	In Use	Luciano Conference Center

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels

☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy

☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Natural Gas Meter: Natural Gas DHW (therms)

Associated With: Luciano Conference Center

Start Date	End Date	Usage
06/11/2012	07/11/2012	129.46
07/12/2012	08/13/2012	124.47
08/14/2012	09/13/2012	186.54
09/14/2012	10/15/2012	125.84
10/16/2012	11/09/2012	150.22
11/10/2012	12/12/2012	632.93
12/13/2012	01/11/2013	312.3
01/12/2013	02/11/2013	176.1
02/12/2013	03/13/2013	222.56
03/14/2013	04/12/2013	314.68
04/13/2013	05/09/2013	30.19
05/10/2013	06/10/2013	179.74
06/11/2013	07/11/2013	129.46 ← estimate
Total Consumption (therms):		2,714.49
Total Consumption (kBtu (thousand Btu)):		271,449

Total Energy Consumption for this Meter
☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas Shared (therms)

Associated With: Luciano Conference Center

Start Date	End Date	Usage
06/11/2012	07/11/2012	1,081.34 ← estimate
07/12/2012	08/13/2012	1,110.83 ← estimate
08/14/2012	09/13/2012	1,222.84 ← estimate
09/14/2012	10/15/2012	1,706.81 ← estimate
10/16/2012	11/09/2012	1,771.2 ← estimate
11/10/2012	12/12/2012	2,897.6 ← estimate
12/13/2012	01/11/2013	1,917.94 ← estimate

Start Date	End Date	Usage
01/12/2013	02/11/2013	2,892.45 ⚡ estimate
02/12/2013	03/13/2013	2,410.29 ⚡ estimate
03/14/2013	04/12/2013	2,701.27 ⚡ estimate
04/13/2013	05/09/2013	1,209.39 ⚡ estimate
05/10/2013	06/10/2013	1,553.33 ⚡ estimate
06/11/2013	07/11/2013	1,081.34 ⚡ estimate
Total Consumption (therms):		23,556.63
Total Consumption (kBtu (thousand Btu)):		2,355,663

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric Meter: Electric Shared (kWh (thousand Watt-hours))

Associated With: Luciano Conference Center

Start Date	End Date	Usage	Green Power?
06/12/2012	07/12/2012	45,611.61 ⚡ estimate	No
07/13/2012	08/13/2012	48,744.28 ⚡ estimate	No
08/14/2012	09/12/2012	46,175.49 ⚡ estimate	No
09/13/2012	10/10/2012	39,910.16 ⚡ estimate	No
10/11/2012	11/12/2012	44,609.16 ⚡ estimate	No
11/13/2012	12/10/2012	37,654.64 ⚡ estimate	No
12/11/2012	01/11/2013	38,970.36 ⚡ estimate	No
01/12/2013	02/12/2013	44,107.93 ⚡ estimate	No
02/13/2013	03/11/2013	37,842.6 ⚡ estimate	No
03/12/2013	04/09/2013	40,035.47 ⚡ estimate	No
04/10/2013	05/09/2013	44,045.28 ⚡ estimate	No
05/10/2013	06/11/2013	45,486.31 ⚡ estimate	No
06/12/2013	07/12/2013	45,611.61 ⚡ estimate	No
Total Consumption (kWh (thousand Watt-hours)):			558,804.9

Total Consumption (kBtu (thousand Btu)):	1,906,642.3
Total Energy Consumption for this Meter ☐ Yes ☐ No	
Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?	
Notes:	

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

Ersin Gercek
 205 Route 46
 Suite 12
 Totowa, NJ 07512
 9738376066
 egercek@real-eng.com



NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



LEARN MORE AT
energystar.gov

ENERGY STAR® Statement of Energy Performance

N/A

Luciano Conference Center

Primary Property Function: College/University

Gross Floor Area (ft²): 23,212

Built: 2005

**ENERGY STAR®
Score¹**

For Year Ending: June 30, 2013

Date Generated: August 17, 2013

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

Luciano Conference Center
3322 College Dr.
Vineland, New Jersey 08360

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

Property ID: 3644269

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

183.4 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	1,751,016 (41%)
Natural Gas (kBtu)	2,506,032 (59%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	137.5
National Median Source EUI (kBtu/ft²)	262.6
% Diff from National Median Source EUI	33%

Source EUI

350.2 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (MtCO2e/year)	355
--	-----

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

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



**Professional Engineer Stamp
(if applicable)**



ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Navone Building

Primary Function: College/University
Gross Floor Area (ft²): 16,165
Built: 2008

For Year Ending: 05/31/2013
Date Generated: 08/17/2013

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

Property & Contact Information

Property Address

Navone Building
3322 College Dr.
Vineland, New Jersey 08360

Property ID: 3644276

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Navone Building

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: College/University

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

3322 College Dr.
Vineland, New Jersey 08360

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 16,165 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 100

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

College/University: Building Use

1) Gross Floor Area: 16,165

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) Weekly Operating Hours: 60

Is this the total number of hours per week that the property is occupied by the majority of the employees? It does not include hours when the property is occupied only by maintenance, security, or other support personnel. The Weekly Operating Hours is not the same as the hours during which the HVAC equipment is run, but rather should be based on the hours during which your property is actually occupied by the majority of the tenants. For properties with a schedule that varies during the year, Weekly Operating Hours refers to the schedule most often followed.

☐ Yes ☐ No

3) Enrollment: Not entered

Is this the total student enrollment for the year (i.e. number of students)?

☐ Yes ☐ No

4) Number of Full Time Equivalent (FTE) Workers: Not entered

Is this the total number of hours worked by all workers in a week divided by the standard hours worked by one full time worker in a week? Workers may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Workers should not include visitors to the property such as clients, customers, or patients.

☐ Yes ☐ No

5) Number of Computers: 60

Is this the total number of computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment.

☐ Yes ☐ No

6) Grant Dollars: Not entered

Is this the annual amount of grant dollars received by the college/university?

☐ Yes ☐ No

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu)	1,215,115.1 (44.2%)
Natural Gas (kBtu)	1,531,484.5 (55.8%)
Total Energy (kBtu)	2,746,599.6

National Median Comparison

National Median Site EUI (kBtu/ft ²)	133
National Median Source EUI (kBtu/ft ²)	262.6
% Diff from National Median Source EUI	27.74%

Energy Intensity

Site (kBtu/ft²) 169.9
Source (kBtu/ft²) 335.5

Emissions (based on site energy use)
Greenhouse Gas Emissions ()

Power Generation Plant or Distribution Utility:
Vineland NJ (City of)

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Natural Gas Shared	Natural Gas	06/11/2012	In Use	Navone Building
Electric Shared	Electric	05/28/0012	In Use	Navone Building

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels

☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy

☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Natural Gas Meter: Natural Gas Shared (therms)

Associated With: Navone Building

Start Date	End Date	Usage
06/11/2012	07/11/2012	753.1 ⚡ estimate

Start Date	End Date	Usage
07/12/2012	08/13/2012	773.64 ⚡ estimate
08/14/2012	09/13/2012	851.64 ⚡ estimate
09/14/2012	10/15/2012	1,188.71 ⚡ estimate
10/16/2012	11/09/2012	1,233.55 ⚡ estimate
11/10/2012	12/12/2012	2,018.03 ⚡ estimate
12/13/2012	01/11/2013	1,335.75 ⚡ estimate
01/12/2013	02/11/2013	2,014.45 ⚡ estimate
02/12/2013	03/13/2013	1,678.65 ⚡ estimate
03/14/2013	04/12/2013	1,881.3 ⚡ estimate
04/13/2013	05/09/2013	842.28 ⚡ estimate
05/10/2013	06/10/2013	1,081.81 ⚡ estimate
Total Consumption (therms):		15,652.91
Total Consumption (kBtu (thousand Btu)):		1,565,291

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric Meter: Electric Shared (kWh (thousand Watt-hours))

Associated With: Navone Building

Start Date	End Date	Usage	Green Power?
05/28/2012	06/26/2012	35,112.27 ⚡ estimate	No
06/27/2012	07/29/2012	49,172.01 ⚡ estimate	No
07/30/2012	08/27/2012	45,392.67 ⚡ estimate	No
08/28/2012	09/27/2012	41,688.42 ⚡ estimate	No
09/28/2012	10/28/2012	34,978.99 ⚡ estimate	No
10/29/2012	11/28/2012	21,403.6 ⚡ estimate	No
11/29/2012	12/27/2012	18,563.46 ⚡ estimate	No
12/28/2012	01/27/2013	17,900.12 ⚡ estimate	No
01/28/2013	02/26/2013	19,006.74 ⚡ estimate	No
02/27/2013	03/27/2013	17,612.69 ⚡ estimate	No

Start Date	End Date	Usage	Green Power?
03/28/2013	04/28/2013	26,115.91 ← estimate	No
04/29/2013	05/28/2013	30,466.66 ← estimate	No
05/29/2013	06/28/2013	35,112.27 ← estimate	No
Total Consumption (kWh (thousand Watt-hours)):			392,525.81
Total Consumption (kBtu (thousand Btu)):			1,339,298.1

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



LEARN MORE AT
energystar.gov

ENERGY STAR® Statement of Energy Performance

N/A

Navone Building

Primary Property Function: College/University

Gross Floor Area (ft²): 16,165

Built: 2008

**ENERGY STAR®
Score¹**

For Year Ending: May 31, 2013

Date Generated: August 17, 2013

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

Navone Building
3322 College Dr.
Vineland, New Jersey 08360

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

Property ID: 3644276

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

169.9 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	1,215,115 (44%)
Natural Gas (kBtu)	1,531,484 (56%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	133
National Median Source EUI (kBtu/ft²)	262.6
% Diff from National Median Source EUI	28%

Source EUI

335.5 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (MtCO2e/year)	N/A
--	-----

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

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



**Professional Engineer Stamp
(if applicable)**



ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Service Building

Primary Function: College/University
Gross Floor Area (ft²): 10,898
Built: 1965

For Year Ending: 05/31/2013
Date Generated: 08/17/2013

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

Property & Contact Information

Property Address

Service Building
3322 College Dr.
Vineland, New Jersey 08360

Property ID: 3644288

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Service Building

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: College/University

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

3322 College Dr.
Vineland, New Jersey 08360

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 10,898 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 100

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

College/University: Building Use

1) Gross Floor Area: 10,898

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) Weekly Operating Hours: 70

Is this the total number of hours per week that the property is occupied by the majority of the employees? It does not include hours when the property is occupied only by maintenance, security, or other support personnel. The Weekly Operating Hours is not the same as the hours during which the HVAC equipment is run, but rather should be based on the hours during which your property is actually occupied by the majority of the tenants. For properties with a schedule that varies during the year, Weekly Operating Hours refers to the schedule most often followed.

☐ Yes ☐ No

3) Enrollment: Not entered

Is this the total student enrollment for the year (i.e. number of students)?

☐ Yes ☐ No

4) Number of Full Time Equivalent (FTE) Workers: Not entered

Is this the total number of hours worked by all workers in a week divided by the standard hours worked by one full time worker in a week? Workers may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Workers should not include visitors to the property such as clients, customers, or patients.

☐ Yes ☐ No

5) Number of Computers: 7

Is this the total number of computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment.

☐ Yes ☐ No

6) Grant Dollars: Not entered

Is this the annual amount of grant dollars received by the college/university?

☐ Yes ☐ No

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Natural Gas (kBtu)	1,032,421 (55.7%)
Electric - Grid (kBtu)	819,685.7 (44.3%)
Total Energy (kBtu)	1,852,106.8

National Median Comparison

National Median Site EUI (kBtu/ft ²)	132.9
National Median Source EUI (kBtu/ft ²)	262.6
% Diff from National Median Source EUI	27.84%

Energy Intensity

Site (kBtu/ft²) 169.9
Source (kBtu/ft²) 335.6

Emissions (based on site energy use)
Greenhouse Gas Emissions ()

Power Generation Plant or Distribution Utility:
Vineland NJ (City of)

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Natural Gas Shared	Natural Gas	06/11/2012	In Use	Service Building
Electric Shared	Electric	05/28/0012	In Use	Service Building

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels

☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy

☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Natural Gas Meter: Natural Gas Shared (therms)

Associated With: Service Building

Start Date	End Date	Usage
06/11/2012	07/11/2012	507.69 ← estimate

Start Date	End Date	Usage
07/12/2012	08/13/2012	521.53 ← estimate
08/14/2012	09/13/2012	574.12 ← estimate
09/14/2012	10/15/2012	801.35 ← estimate
10/16/2012	11/09/2012	831.58 ← estimate
11/10/2012	12/12/2012	1,360.42 ← estimate
12/13/2012	01/11/2013	900.47 ← estimate
01/12/2013	02/11/2013	1,358 ← estimate
02/12/2013	03/13/2013	1,131.63 ← estimate
03/14/2013	04/12/2013	1,268.24 ← estimate
04/13/2013	05/09/2013	567.8 ← estimate
05/10/2013	06/10/2013	729.28 ← estimate
Total Consumption (therms):		10,552.11
Total Consumption (kBtu (thousand Btu)):		1,055,211

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric Meter: Electric Shared (kWh (thousand Watt-hours))

Associated With: Service Building

Start Date	End Date	Usage	Green Power?
05/28/2012	06/26/2012	23,670.27 ← estimate	No
06/27/2012	07/29/2012	33,148.37 ← estimate	No
07/30/2012	08/27/2012	30,600.6 ← estimate	No
08/28/2012	09/27/2012	28,103.45 ← estimate	No
09/28/2012	10/28/2012	23,580.42 ← estimate	No
10/29/2012	11/28/2012	14,428.83 ← estimate	No
11/29/2012	12/27/2012	12,514.2 ← estimate	No
12/28/2012	01/27/2013	12,067.03 ← estimate	No
01/28/2013	02/26/2013	12,813.03 ← estimate	No
02/27/2013	03/27/2013	11,873.26 ← estimate	No

Start Date	End Date	Usage	Green Power?
03/28/2013	04/28/2013	17,605.54 ← estimate	No
04/29/2013	05/28/2013	20,538.52 ← estimate	No
05/29/2013	06/26/2013	23,670.27 ← estimate	No
Total Consumption (kWh (thousand Watt-hours)):			264,613.79
Total Consumption (kBtu (thousand Btu)):			902,862.3

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



LEARN MORE AT
energystar.gov

ENERGY STAR® Statement of Energy Performance

N/A

Service Building

Primary Property Function: College/University

Gross Floor Area (ft²): 10,898

Built: 1965

**ENERGY STAR®
Score¹**

For Year Ending: May 31, 2013

Date Generated: August 17, 2013

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

Service Building
3322 College Dr.
Vineland, New Jersey 08360

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

Property ID: 3644288

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

169.9 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	1,032,421 (56%)
Electric - Grid (kBtu)	819,686 (44%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	132.9
National Median Source EUI (kBtu/ft²)	262.6
% Diff from National Median Source EUI	28%

Source EUI

335.6 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (MtCO2e/year)	N/A
--	-----

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

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



**Professional Engineer Stamp
(if applicable)**



ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

Student Center

Primary Function: College/University
Gross Floor Area (ft²): 29,326
Built: 1965

For Year Ending: 05/31/2013
Date Generated: 08/17/2013

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

Property & Contact Information

Property Address

Student Center
3322 College Dr.
Vineland, New Jersey 08360

Property ID: 3644307

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Student Center

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: College/University

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

3322 College Dr.
Vineland, New Jersey 08360

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 29,326 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 100

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

College/University: Building Use

1) Gross Floor Area: 29,326

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) Weekly Operating Hours: 70

Is this the total number of hours per week that the property is occupied by the majority of the employees? It does not include hours when the property is occupied only by maintenance, security, or other support personnel. The Weekly Operating Hours is not the same as the hours during which the HVAC equipment is run, but rather should be based on the hours during which your property is actually occupied by the majority of the tenants. For properties with a schedule that varies during the year, Weekly Operating Hours refers to the schedule most often followed.

☐ Yes ☐ No

3) Enrollment: Not entered

Is this the total student enrollment for the year (i.e. number of students)?

☐ Yes ☐ No

4) Number of Full Time Equivalent (FTE) Workers: Not entered

Is this the total number of hours worked by all workers in a week divided by the standard hours worked by one full time worker in a week? Workers may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Workers should not include visitors to the property such as clients, customers, or patients.

☐ Yes ☐ No

5) Number of Computers: 96

Is this the total number of computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment.

☐ Yes ☐ No

6) Grant Dollars: Not entered

Is this the annual amount of grant dollars received by the college/university?

☐ Yes ☐ No

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Natural Gas (kBtu)	3,230,349.1 (59.4%)
Electric - Grid (kBtu)	2,204,284.7 (40.6%)
Total Energy (kBtu)	5,434,633.8

National Median Comparison

National Median Site EUI (kBtu/ft ²)	138.4
National Median Source EUI (kBtu/ft ²)	262.6
% Diff from National Median Source EUI	33.89%

Energy Intensity

Site (kBtu/ft²) 185.3
Source (kBtu/ft²) 351.7

Emissions (based on site energy use)
Greenhouse Gas Emissions ()

Power Generation Plant or Distribution Utility:
Vineland NJ (City of)

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Natural Gas DHW	Natural Gas	06/11/2012	In Use	Student Center
Natural Gas Shared	Natural Gas	06/11/2012	In Use	Student Center
Electric Shared	Electric	05/28/0012	In Use	Student Center

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels

☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy

☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Natural Gas Meter: Natural Gas DHW (therms)

Associated With: Student Center

Start Date	End Date	Usage
06/11/2012	07/11/2012	294.41
07/12/2012	08/13/2012	434.09
08/14/2012	09/13/2012	322.78
09/14/2012	10/15/2012	498.16
10/16/2012	11/09/2012	418.54
11/10/2012	12/12/2012	639.17
12/13/2012	01/11/2013	100.98
01/12/2013	02/11/2013	381.37
02/12/2013	03/13/2013	454.48
03/14/2013	04/12/2013	439.72
04/13/2013	05/09/2013	365.39
05/10/2013	06/10/2013	250.8
Total Consumption (therms):		4,599.89
Total Consumption (kBtu (thousand Btu)):		459,989

Total Energy Consumption for this Meter

☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas Shared (therms)

Associated With: Student Center

Start Date	End Date	Usage
06/11/2012	07/11/2012	1,366.17 ← estimate
07/12/2012	08/13/2012	1,403.42 ← estimate
08/14/2012	09/13/2012	1,544.93 ← estimate
09/14/2012	10/15/2012	2,156.39 ← estimate
10/16/2012	11/09/2012	2,237.74 ← estimate
11/10/2012	12/12/2012	3,660.82 ← estimate
12/13/2012	01/11/2013	2,423.12 ← estimate
01/12/2013	02/11/2013	3,654.32 ← estimate
02/12/2013	03/13/2013	3,045.16 ← estimate

Start Date	End Date	Usage
03/14/2013	04/12/2013	3,412.77 ← estimate
04/13/2013	05/09/2013	1,527.94 ← estimate
05/10/2013	06/10/2013	1,962.47 ← estimate
Total Consumption (therms):		28,395.25
Total Consumption (kBtu (thousand Btu)):		2,839,525

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric Meter: Electric Shared (kWh (thousand Watt-hours))			
Associated With: Student Center			
Start Date	End Date	Usage	Green Power?
05/28/2012	06/26/2012	63,695.57 ← estimate	No
06/27/2012	07/29/2012	89,200.69 ← estimate	No
07/30/2012	08/27/2012	82,344.75 ← estimate	No
08/28/2012	09/27/2012	75,625.06 ← estimate	No
09/28/2012	10/28/2012	63,453.79 ← estimate	No
10/29/2012	11/28/2012	38,827.3 ← estimate	No
11/29/2012	12/27/2012	33,675.12 ← estimate	No
12/28/2012	01/27/2013	32,471.79 ← estimate	No
01/28/2013	02/26/2013	34,479.25 ← estimate	No
02/27/2013	03/27/2013	31,950.37 ← estimate	No
03/28/2013	04/28/2013	47,375.67 ← estimate	No
04/29/2013	05/28/2013	55,268.17 ← estimate	No
05/29/2013	06/28/2013	63,695.57 ← estimate	No
Total Consumption (kWh (thousand Watt-hours)):			712,063.1
Total Consumption (kBtu (thousand Btu)):			2,429,559.3

Total Energy Consumption for this Meter☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:**4. Signature & Stamp of Verifying Licensed Professional**

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



LEARN MORE AT
energystar.gov

ENERGY STAR® Statement of Energy Performance

N/A

Student Center

Primary Property Function: College/University

Gross Floor Area (ft²): 29,326

Built: 1965

**ENERGY STAR®
Score¹**

For Year Ending: May 31, 2013

Date Generated: August 17, 2013

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

Student Center
3322 College Dr.
Vineland, New Jersey 08360

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

Property ID: 3644307

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

185.3 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	3,230,349 (59%)
Electric - Grid (kBtu)	2,204,285 (41%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	138.4
National Median Source EUI (kBtu/ft²)	262.6
% Diff from National Median Source EUI	34%

Source EUI

351.7 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (MtCO2e/year)	N/A
--	-----

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

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



**Professional Engineer Stamp
(if applicable)**



ENERGY STAR® Data Verification Checklist

N/A

ENERGY STAR®
Score¹

University Center

Primary Function: College/University
Gross Floor Area (ft²): 17,498
Built: 2008

For Year Ending: 06/30/2013
Date Generated: 08/17/2013

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

Property & Contact Information

Property Address

University Center
3322 College Dr.
Vineland, New Jersey 08360

Property ID: 3644314

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: University Center

Is this the official name of the property?

☐ Yes ☐ No

If "No", please specify: _____

2) Primary Function: College/University

Is this an accurate description of the primary use of this property?

☐ Yes ☐ No

3) Location:

3322 College Dr.
Vineland, New Jersey 08360

Is this correct and complete?

☐ Yes ☐ No

4) Gross Floor Area: 17,498 ft²

☐ Yes ☐ No

Does this represent the entire property? (i.e., no part of the building/property was excluded/subtracted from the total) If "no" please specify what space has been excluded.

5) Annual Occupancy: 100

Is this occupancy accurate for the entire 12 month period being assessed?

☐ Yes ☐ No

6) Number of Buildings: 1

Does this number accurately represent all structures?

☐ Yes ☐ No

Notes:

Indoor Environmental Standards

1) Ventilation for Acceptable Indoor Air Quality

Does this property meet the ASHRAE Standard 62 for ventilation for acceptable indoor air quality?

☐ Yes ☐ No

2) Acceptable Thermal Environmental Conditions

Does this property meet the ASHRAE Standard 55 for thermal comfort?

☐ Yes ☐ No

3) Adequate Illumination

Does this property adhere to the IESNA Lighting Handbook for lighting quality?

☐ Yes ☐ No

Notes:

2. Review of Property Use Details

College/University: Building Use

1) Gross Floor Area: 17,498

Is this the total size, as measured between the principal exterior surfaces of the enclosing fixed walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross

☐ Yes ☐ No

Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) Weekly Operating Hours: 60

Is this the total number of hours per week that the property is occupied by the majority of the employees? It does not include hours when the property is occupied only by maintenance, security, or other support personnel. The Weekly Operating Hours is not the same as the hours during which the HVAC equipment is run, but rather should be based on the hours during which your property is actually occupied by the majority of the tenants. For properties with a schedule that varies during the year, Weekly Operating Hours refers to the schedule most often followed.

☐ Yes ☐ No

3) Enrollment: Not entered

Is this the total student enrollment for the year (i.e. number of students)?

☐ Yes ☐ No

4) Number of Full Time Equivalent (FTE) Workers: Not entered

Is this the total number of hours worked by all workers in a week divided by the standard hours worked by one full time worker in a week? Workers may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Workers should not include visitors to the property such as clients, customers, or patients.

☐ Yes ☐ No

5) Number of Computers: 27

Is this the total number of computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment.

☐ Yes ☐ No

6) Grant Dollars: Not entered

Is this the annual amount of grant dollars received by the college/university?

☐ Yes ☐ No

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu)	1,320,050.9 (43.8%)
Natural Gas (kBtu)	1,694,361 (56.2%)
Total Energy (kBtu)	3,014,411.9

National Median Comparison

National Median Site EUI (kBtu/ft ²)	133.6
National Median Source EUI (kBtu/ft ²)	262.6
% Diff from National Median Source EUI	28.97%

Energy Intensity

Site (kBtu/ft ²)	172.3	Emissions (based on site energy use)	
Source (kBtu/ft ²)	338.6	Greenhouse Gas Emissions ()	257.1

Power Generation Plant or Distribution Utility:
Vineland NJ (City of)

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values.

Meter Name	Fuel Type	Start Date	End Date	Associated With
Electric Grid Meter	Electric	06/11/2012	In Use	University Center
Natural Gas	Natural Gas	06/11/2012	In Use	University Center

Total Energy Use

☐ Yes ☐ No

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels

☐ Yes ☐ No

Do the meters above include all fuel *types* at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy

☐ Yes ☐ No

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: University Center

Start Date	End Date	Usage	Green Power?
06/12/2012	07/12/2012	34,385.56 ← estimate	No

Start Date	End Date	Usage	Green Power?
07/13/2012	08/13/2012	36,747.21 ⚡ estimate	No
08/14/2012	09/12/2012	34,810.66 ⚡ estimate	No
09/13/2012	10/10/2012	30,087.37 ⚡ estimate	No
10/11/2012	11/12/2012	33,629.83 ⚡ estimate	No
11/13/2012	12/10/2012	28,386.98 ⚡ estimate	No
12/11/2012	01/11/2013	29,378.87 ⚡ estimate	No
01/12/2013	02/12/2013	33,251.97 ⚡ estimate	No
02/13/2013	03/11/2013	28,528.68 ⚡ estimate	No
03/12/2013	04/09/2013	30,181.83 ⚡ estimate	No
04/10/2013	05/09/2013	33,204.74 ⚡ estimate	No
05/10/2013	06/11/2013	34,291.09 ⚡ estimate	No
06/12/2013	07/12/2013	34,385.56 ⚡ estimate	No
Total Consumption (kWh (thousand Watt-hours)):			421,270.35
Total Consumption (kBtu (thousand Btu)):			1,437,374.4

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas (therms)

Associated With: University Center

Start Date	End Date	Usage
06/11/2012	07/11/2012	815.2 ⚡ estimate
07/12/2012	08/13/2012	837.43 ⚡ estimate
08/14/2012	09/13/2012	921.87 ⚡ estimate
09/14/2012	10/15/2012	1,286.73 ⚡ estimate
10/16/2012	11/09/2012	1,335.27 ⚡ estimate
11/10/2012	12/12/2012	2,184.43 ⚡ estimate
12/13/2012	01/11/2013	1,445.89 ⚡ estimate
01/12/2013	02/11/2013	2,180.55 ⚡ estimate

Start Date	End Date	Usage
02/12/2013	03/13/2013	1,817.07 ← estimate
03/14/2013	04/12/2013	2,036.42 ← estimate
04/13/2013	05/09/2013	911.73 ← estimate
05/10/2013	06/10/2013	1,171.02 ← estimate
06/11/2013	07/11/2013	815.2
Total Consumption (therms):		17,758.81
Total Consumption (kBtu (thousand Btu)):		1,775,881

Total Energy Consumption for this Meter ☐ Yes ☐ No

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

_____ (Name) visited this site on _____ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature: _____ Date: _____

Licensed Professional

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineer Stamp
(if applicable)



LEARN MORE AT
energystar.gov

ENERGY STAR® Statement of Energy Performance

N/A

University Center

Primary Property Function: College/University

Gross Floor Area (ft²): 17,498

Built: 2008

**ENERGY STAR®
Score¹**

For Year Ending: June 30, 2013

Date Generated: August 17, 2013

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

University Center
3322 College Dr.
Vineland, New Jersey 08360

Property Owner

Cumberland County College
3322 College Drive
Vineland, NJ 08362
() -

Primary Contact

Brian Ewan
3322 College Drive
Vineland, NJ 08362
856-691-86-00
contact@real-eng.com

Property ID: 3644314

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

172.3 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	1,320,051 (44%)
Natural Gas (kBtu)	1,694,361 (56%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	133.6
National Median Source EUI (kBtu/ft²)	262.6
% Diff from National Median Source EUI	29%

Source EUI

338.6 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (MtCO ₂ e/year)	257
---	-----

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

Ersin Gercek
205 Route 46
Suite 12
Totowa, NJ 07512
9738376066
egercek@real-eng.com



**Professional Engineer Stamp
(if applicable)**



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

EQUIPMENT INVENTORY LISTS

CUMBERLAND COUNTY COLLEGE
Academic Building

Air Handling Units - AHU																
Building	Tag#	Location	Area Serving	Equipment	Mfg.	Model	Quantity	Cooling Source	Supply Air CFM	Fan HP	Supply Fan VFD	Cooling Capacity (tons)	Heating Source	Age	Estimated Service Life	Serial Numbers
Academic Building	AH-AC-1	MER	Building	Air Handling Unit	Arizon	M12915-AH-AC-1-DLOPSOWN00	1	Chilled Water	25000	25	Yes	120	Hot water	5	15	M12914
Academic Building	AH-AC-2	MER	Building	Air Handling Unit	Arizon	M12915-AH-AC-2-DLOPSOWN00	1	Chilled Water	25000	25	Yes	120	Hot water	5	15	M12915

Roof top units - RTU																	
Building	Tag#	Location	Area Serving	Equipment	Mfg.	Model	Quantity	Cooling Source	Supply Air CFM	Fan HP	Cooling Capacity (tons)	Heating Source	Age	Estimated Service Life	Remaining Life	EER	Serial Number
Academic Building	RTU 1	Roof	Computer Annex	Roof Top Unit	Carrier	48HJD012	1	DX	4000	3	10	Natural Gas	12	15	3	N/A	2001G33142
Academic Building	RTU-3	Roof	Lecture Hall #2	Roof Top Unit	Carrier	50TFQ005	1	DX	1800	1.5	4	Heat Pump	5	15	10	8.9	1508G30491
Academic Building	RTU-4	Roof	Av Studio	Roof Top Unit	Carrier	50TFQ005	1	DX	1200	10	4	Heat Pump	5	15	10	8.9	1508G30492
Academic Building	N/A	Roof	Academic Support Labs.	Roof Top Unit	Carrier	N/A	2	DX	N/A	N/A	15	Heat Pump	5	15	10	8.9	N/A
Academic Building	N/A	Roof	Computer Tech.	Roof Top Unit	Carrier	N/A	4	DX	N/A	N/A	7.5	Hot Water	20	15	-5	8	N/A

Domestic Hot Water Heaters																
Building	Tag#	Location	Area Serving	Equipment	Quantity	Mfg.	Model	Fuel	Input BRU/h	Gross output	Age	Estimated Service Life	Capacity (Gallon)	Watts	Serial Number	Circulator
Academic Building	DHW-1	MER	Entire Building	Domestic HW	1	Bradford White	M-I-20U5SS-12	Electric	N/A		21	15	19.9	1500	J80096961	N
Academic Building	DHW-2	MER	Entire Building	Domestic HW	1	A.O Smith	BTC-197	Natural Gas	197000		22	15	100	N/A	MH91-0207063	y

Pumps													
Building	Tag#	Location	Area Serving	Equipment	Motor mfg.	Motor Model	Quantity	GPM	Head ft.	HP	Efcy.	Motor RPM	Estimated Life
Academic Building	CHWP-1	MER	Entire Building	CHWP	Dynamatic Division	-	1	61	5	5	-	1750	15
Academic Building	CHWP-2	MER	Entire Building	CHWP	Marathon Electric	RVC 184TTDR7026DF	1	-	-	5	85.5	1740	15
Academic Building	HWP-3	MER	Entire Building	HWP	Wagner	213-71962	1	-	-	3	82.5	1750	15
Academic Building	HWP-4	MER	Entire Building	HWP	Baldor	35L101T676	1	-	-	3	82.5	1725	15
Academic Building	HWP-5	MER	Entire Building	HW Circulation	Hydro-Flo	-	1	-	-	5	-	1750	15

CUMBERLAND COUNTY COLLEGE
Administration Building

Air Handling Units - AHU																
Building	Tag#	Location	Area Serving	Equipment	Mfg.	Model	Quantity	Cooling Technology	Supply Air CFM	Fan HP	Supply Fan VFD	Cooling Capacity (tons)	Heating Source	Age	Estimated Service Life	Serial Number
Administration Building	AHU-1	MER	Entire Building	Air Handling Unit	N/A	N/A	1	Chilled Water	N/A	15	Y	50 (Est.)	Hot Water	25 (Est.)	-	N/A

Roof top units - RTU																	
Building	Tag#	Location	Area Serving	Equipment	Mfg.	Model	Quantity	Cooling Technology	SEER	Fan HP	Supply Fan VFD	Cooling Capacity (tons)	Heating Technology	Age	Estimated Service Life	Remaining Life	Serial Number
Administration Building	RTU-1-2	Roof	-	Roof Top Unit	Carrier	50TC-A06A2A6A0A0A0	2	DX	13	-	N	5	Electric	3	15	12	4610G10279

Domestic Hot Water Heaters													
Building	Tag#	Location	Area Serving	Equipment	Quantity	Mfg.	Model	Fuel	Input (Mbh)	Gross output Btu/h	Estimated Service Life	Capacity (Gallons)	
Administration Building	N/A	MER	Building	N/A	1	N/A	N/A	Electric	N/A	N/A	N/A	20 (Est.)	

Pumps													
Building	Tag#	Location	Area Serving	Equipment	Motor mfg.	Motor Model	Quantity	GPM	Head ft.	HP	Eff	Motor RPM	Estimated Life
Administration Building	CWHP-1-2	MER	Entire Building	Circulator	Unimount	-	2	50	50	2	-	1725	15
Administration Building	HWP-1-2	MER	Entire Building	Circulator	Unimount	-	2	45	45	1.5	82.5	1750	15

Air Handling Units - AHU																	
Building	Tag#	Location	Area Serving	Equipment	Mfg.	Model	Quantity	Cooling Technology	Supply Air CFM	Fan HP	Supply Fan VFD	Cooling Capacity (tons)	Heating Source	Age	Estimated Service Life	Serial Number	Return Fan
Library	AHU-1	MER	Building	Air Handling Unit	York	XTI-051X090-FMJ046A	1	Chilled Water	-	20	-	60	Hot Water	2	15	CGSMXT0063	7.5

AHU-1 is equipped with an energy recovery ventilator. The unit has an energy wheel.

Domestic Hot Water Heaters															
Building	Tag#	Location	Area Serving	Equipment	Quantity	Mfg.	Model	Fuel	Input (Mbh)	Gross output Btu/h	Age	Estimated Service Life	Capacity (Gallons)	Input Watts	Serial Number
Library	DHW-1	MER	Entire Building	Domestic hot water heater	1	A.O Smith	Del-30-110	Electric	N/A	N/A	8	20	30	4500	L05M006911

Pumps													
Building	Tag#	Location	Area Serving	Equipment	Motor mfg.	Motor Model	Quantity	GPM	Head ft.	HP	Eff	Motor RPM	Estimated Life
Library	P-1-2	MER	Entire Building	CHWP	MEG	005180T3E184T	1	140	80	5	89.5	1755	15
Library	P-3-4	MER	Entire Building	HWP	Marathon	145TTDR56318D	1	60	60	2	84	1735	15
Library	P-5	MER	Entire Building	Circulator	Marathon	EQF 56C17D5536F	1	-	-	0.5	-	-	15

CUMBERLAND COUNTY COLLEGE
Luciano Conference Center

Air Handling Units - AHU																
Building	Tag#	Location	Area Serving	Equipment	Mfg.	Model	Quantity	Cooling Technology	Supply Air CFM	Fan HP	Supply Fan VFD	Cooling Capacity (tons)	Heating Source	Age	Estimated Service Life	Serial Number
Luciano Conference Center	AHU-1	MER	Conference area, lobby	Air Handling Unit	MCQuay	CAH040FDAG	1	Chilled Water	16000	15	Yes	77.5	Hot Water	10	15	FB0U0411001105
Luciano Conference Center	AHU-2	MER	3 small meeting rooms, board room	Air Handling Unit	MCQuay	CAH025FDAC	1	Chilled Water	9300	7.5	Yes	32	Hot Water	10	15	FB0U0411001106
Luciano Conference Center	AHU-3	MER		Office area	Air Handling Unit	MCQuay	CAH006FDAC	1	Chilled Water	2800	3	Yes	8	Hot Water	10	15
Luciano Conference Center	AHU-4	MER	Kitchen area	Air Handling Unit	MCQuay	CAH010FDAC	1	Chilled Water	4800	7.5	Yes	36	Hot Water	10	15	FB0U0411001108
Luciano Conference Center	AC-1	Equip Rm	Server Room	-	Liebert	Mini Mate	1	DX	1250	-	-	3	-	10	15	

Domestic Hot Water Heaters															
Building	Tag#	MER	Area Serving	Equipment	Quantity	Mfg.	Model	Fuel	Input Btu/h	Gross output Btu/h	Age	Estimated Service Life	Capacity (Gallons)	Serial Number	Circulator
Luciano Conference Center	DHW-1	MER	Entire Building	DHWH	1	PVI	500N225A-TP	Natural Gas	399000		10	20	225	1104114557	N

Pumps														
Building	Tag#	Location	Area Serving	Equipment	Motor mfg.	Motor Model	Quantity	GPM	Head ft.	HP	Eff	Motor RPM	Estimated Life	
Luciano Conference Center	CHWP 1-2	MER	Entire Building	CHW	Marathon Electric	215TTDBA4026AN	2	360	65	10	89.5	1760	15	
Luciano Conference Center	HW- 1-2	MER	Entire Building	HW	Marathon Electric	213TTDBA4026AA	2	180	75	7.5	88.5	1760	15	

CUMBERLAND COUNTY COLLEGE
Navone Healthcare Center

Air Handling Units - AHU																
Building	Tag#	Location	Area Serving	Equipment	Mfg.	Model	Quantity	Cooling Technology	Supply Air CFM	Fan HP	Supply Fan VFD	Cooling Capacity (tons)	Heating Source	Age	Estimated Service Life	Serial Number
Navone Healthcare Center	AHU-1	MER	Building	Air Handling Unit	York	XTI-069X108-FBNL046A	1	Chilled Water	N/A	25	Y	52	Hot Water	6	15	CHSMXT0175
Navone Healthcare Center	AHU-2	MER	Building	Air Handling Unit	York	XTI-045X078-FBKHO46A	1	Chilled Water	N/A	10	Y	52	Hot Water	6	15	CHSMXT0176

Domestic Hot Water Heaters																
Building	Tag#	Location	Area Serving	Equipment	Quantity	Mfg.	Model	Fuel	Input Btu/h	Gross output Btu/h	Age	Estimated Service Life	Capacity (Gallons)	Power, Watts	Serial Number	
Navone Healthcare Center	DHW-1	MER	Entire Building	Domestic hot water heater	1	A.O Smith	DSE30	Electric	-	-	6	20	30	12000	177955-H07	

Pumps														
Building	Tag#	Location	Area Serving	Equipment	Motor mfg.	Motor Model	Quantity	GPM	Head ft.	HP	Eff	Motor RPM	Estimated Life	
Navone Healthcare Center	CHWP-1-2	MER	Entire Building	CHWP	Marathon	184TTDB4026BR	2	125	55	5	87.5	1745	15	
Navone Healthcare Center	HWP-1-2	MER	Entire Building	HWP	Marathon	184TTDB4026BR	2	125	55	5	87.5	1745	15	

CUMBERLAND COUNTY COLLEGE
Service Center

Roof top units - RTU																	
Building	Tag#	Location	Area Serving	Equipment	Mfg.	Model	Quantity	Cooling Technology	Supply Air CFM	Fan HP	Supply Fan VFD	Cooling Capacity (tons)	Heating Technology	Age	Estimated Service Life	EER	Serial Number
Service Building	RTU-1-2	ROOF	Building	Roof Top Unit	York	B3CH048A46ECC	2	WSHP	1600	-	-	4	Heat Pump	17	15	8	NDEM041555-NFEM065003

Domestic Hot Water Heaters														
Building	Tag#	Location	Area Serving	Equipment	Quantity	Mfg.	Model	Fuel	Input (Btu/h)	Gross output Btu/h	Age	Estimated Service Life	Capacity (Gallons)	Serial Number
Service Building	DHW-1	MER	Building	DHW	1	State	SRX75NQRT60	Natural Gas	75100		25	20	75	L88827641

Pumps														
Building	Tag#	Location	Area Serving	Equipment	Motor mfg.	Motor Model	Quantity	GPM	Head ft.	HP	Eff	Motor RPM	Estimated Life	
Service Building	CHWP	MER	Chilled Water Loop	CHWP	Super-E	-	2	360	-	7.5	91	1770	15	
Service Building	P-C2	MER	Chilled Water Loop	CHWP	Super-E	VEJRR33111	1	360	-	7.5	91	1770	15	
Service Building	PC-4	MER	Chilled Water Loop	CHWP	US Electric	A393	1	720	48	15	91.7	1760	15	
Service Building	PC-5	MER	Chilled Water Loop	CHWP	WEG	A393	1	760	40	10	91.7	1765	15	
Service Building	PCW-4	MER	Chilled Water Loop	CHWP	WEG	015180T3E254T	1	630	70	15	93	1775	15	
Service Building	PCW-5	MER	Chilled Water Loop	CHWP	US Electric	AS93	2	630	70	15	93	1780	15	
Service Building	PCW-6	MER	Chilled Water Loop	CHWP	US Electric	AS93	2	600	70	15	93	1780	15	
Service Building	P-CT-1-2	MER	Condenser Water Loop	CWP	US Electric	R354	2	900	63	25	92.4	1185	15	
Service Building	P-CT-3	MER	Condenser Water Loop	Filtration Circuit	WEG	01ABR10	1	-	-	7.5	86.5	3480	15	
Service Building	-	MER	Condenser Water Loop	CWP	Marathon	324TTDC6076AA	2	1125	60	25	93	1190	15	
Service Building	HWP-1	MER	Hot Water Loop	HWP	Super-E	VEJNN3216T	1	215	25	5	89.5	1750	15	
Service Building	P-B5	MER	Hot Water Loop	HWP	Baldor	EM3311T	1	400	35	7.5	91	1770	15	
Service Building	P-B4	MER	Hot Water Loop	HWP	WEG	01ABR10	1	400	35	7.5	91	1760	15	
Service Building	P-HW-6	MER	Hot Water Loop	HWP	WEG	007180T3E213T	1	160	70	7.5	91	1760	15	
Service Building	P-HW-5	MER	Hot Water Loop	HWP	US Electric	R341	2	160	70	7.5	91	1760	15	

Boilers													
Building	Tag#	Location	Area Serving	Mfg.	Model	Quantity	Fuel	SV Capacity (BTU/Hr)	Object Capacity (BTU/Hr)	Age	Estimated Service Life	Serial Number	
Service Building	B-1	MER		HB Smith	C3-G0-25	1	Natural Gas	6,440,000	2,330,400	33	35	HSB-06322	
Service Building	B-2-3	MER		HB Smith	-	1	Natural Gas	6,440,000	2,717,400	47	35	HSB-06321	
Service Building	B-4	MER		Hurst	34-X-150-30W	2	Natural Gas	6,215,055	6,000,000	10	35	NB11173-112175	

Chiller														
Building	Tag#	Location	Area Serving	Mfg.	Model	Condenser Type	Quantity	Ton	ARI Rated Full Load Efficiency (kW/ton)	Integrated Part-load Efficiency (IPLV)	Condenser Type	Age	Serial Number	
Service Building	C-1	MER		Carrier	23XRV3737NRVAA5	Water Cooled	1	375	0.56		134a	3	3310Q20006	
Service Building	C-2	MER		York	YK-AD-AD-P1-CJF	Water Cooled	1	300	0.58	0.37	134a	10	SLMM-097330	
Service Building	-	MER		Carrier	30HXC146RY-661KA	Water Cooled	3	146	0.72	0.54	134a	4	453-1109Q17380-1509Q17452	

CUMBERLAND COUNTY COLLEGE
Student Center

Air Handling Units - AHU																
Building	Tag#	Location	Area Serving	Equipment	Mfg.	Model	Quantity	Cooling Technology	Supply Air CFM	Fan HP	Supply Fan VFD	Cooling Capacity (tons)	Heating Source	Age	Estimated Service Life	Serial Number
Student Center	AHU-1	MER	Meeting Room-TV room Store	Air Handling Unit	McQuay	CAH030FDAC	1	Chilled Water	12765	15	Yes	40	Hot Water	9	15	FB0U041100109
Student Center	AHU-2	MER	Office Area	Air Handling Unit	McQuay	CAH010FDAC	1	Chilled Water	4000	5	Yes	15	Hot Water	9	15	FB0U041100110
Student Center	AHU-3	MER	Café	Air Handling Unit	McQuay	CAH017FDAC	1	Chilled Water	8000	10	Yes	36	Hot Water	9	15	FB0U041100111
Student Center	AHU-4	MER	1st Floor	Air Handling Unit	McQuay	WY-350-GHS	1	Chilled Water	12000	15	Yes	35	Hot Water	9	15	FB0U041100115
Student Center	RTU-1	Roof	-	Roof Top Unit	McQuay	OACO25GVAC	1	WSHP	12000	10	-	25	Hot Water	9	15	FB0U051200450
Domestic Hot Water Heaters																
Building	Tag#	MER	Area Serving	Equipment	Quantity	Mfg.	Model	Fuel	Input Btu/h	Gross output Btu/h	Age	Estimated Service Life	Capacity (Gallons)	Serial Number		
Student Center	DHW-1	MER	Entire Building	DHWH	1	AO Smith	BTR-154-110	Natural Gas	-	154000	9	20	81	H04M005432		
Pumps																
Building	Tag#	Location	Area Serving	Equipment	Motor mfg.	Motor Model	Quantity	GPM	Head ft.	HP	Eff	Motor RPM	Estimated Life			
Student Center	CHWP-1-2	MER	Entire Building	CHWP	US Motors	AE53	2	400	65	15	88.5	1775	15			
Student Center	HWP-1-2	MER	Entire Building	HWP	Marathon	215TTDBA4026AN	2	325	65	10	89.5	1760	15			

CUMBERLAND COUNTY COLLEGE
University Center

Air Handling Units - AHU																
Building	Tag#	Location	Area Serving	Equipment	Mfg.	Model	Quantity	Cooling Technology	Supply Air CFM	Fan HP	Supply Fan VFD	Cooling Capacity (tons)	Heating Technology	Age	Estimated Service Life	Serial Number
University Center	AHU-1	MER	Building	Air Handling Unit	Carrier	N/A	1	Chilled Water	N/A	15	N/A	25 (Est.)	Hot water	6	15	N/A
University Center	AHU-2	MER	Building	Air Handling Unit	Carrier	39MPSTF04NJGBXXG4	1	Chilled Water	18000	25	N/A	39	Hot water	6	15	2607U19338

Domestic Hot Water Heaters																
Building	Tag#	Location	Area Serving	Equipment	Quantity	Mfg.	Model	Fuel	Input Btu/h	Gross output Btu/h	Estimated Service Life	Capacity (Gallons)		Age	Estimated Service Life	
University Center	DHW-1	MER	Entire Building	DHWH	1	A.O Smith	-	Electric	-	-	-	-		6	10	

Pumps																
Building	Tag#	Location	Area Serving	Equipment	Motor mfg.	Motor Model	Quantity	GPM	Head ft.	HP	Eff	Motor RPM	Estimated Life	Age	Estimated Service Life	
University Center	CHWP 1-2	MER	Entire Building	CHW	Marathon Electric	184TTDR6026FP	2	-	-	5	89.5	1750	15	6	20	
University Center	HWP-1	MER	Entire Building	HHW	Emerson	AT66	2	59	46	2	86.5	1740	15	6	20	

AHU Motors										
Building	Tag#	Location	Motor mfg.	Motor Model	Quantity	HP	Eff	Motor RPM	Age	Estimated Service Life
University Center	AHU-2 Supply	MER	Baldor	EH3M9242T	1	25	92.4	1775	6	15
University Center	AHU-1 Supply	MER	Baldor	EH3M9235T	1	15	91.7	1760	6	15



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM LIST

(Page left blank intentionally)



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #1:

VENDING MACHINE POWER MANAGEMENT

Vending Machine Power Management

	Existing Condition	Proposed System	Savings
Soda Machine Power Consumption	100%	54%	-
Annual Op Cost	\$3,873	\$2,092	-
Run Hours	8,760	8,760	-
Annual Energy Consumption (kWh)	29,434	15,894	13,539
Annual Cost and Savings \$	\$3,873	\$2,092	\$1,782

Cost Each	\$289
Total Cost	\$4,046
PB	2.27

	Academic Building	Admin Building	Student Center	University Center	Navone Building	Total
Soda Vending Machine Count	2	1	2	1	1	7
Snack Vending Machine Count	2	1	2	1	1	7
Annual Run-Time Factor	100%	100%	100%	100%	100%	100%

Soda Machine Power Consumption,kW	0.4
Snack Machine Power Consumption,kW	0.08
Annual Savings %	46%
Electrical Unit Cost, \$ per kWh	\$0.132
Annual Energy Savings	\$1,782

Academic	Existing Condition	Proposed System	Savings	Cost	PB
Soda Machine Power Consumption	100%	54%	-	\$1,156	2.3
Annual Op Cost	\$1,107	\$598	-		
Run Hours	8,760	8,760	-		
Annual Energy Consumption (kWh)	8,410	4,541	3,868		
Annual Cost and Savings \$	\$1,107	\$598	\$509		

Admin Building	Existing Condition	Proposed System	Savings	Cost	PB
Soda Machine Power Consumption	100%	54%	-	\$578	2.3
Annual Op Cost	\$553	\$299	-		
Run Hours	8,760	8,760	-		
Annual Energy Consumption (kWh)	4,205	2,271	1,934		
Annual Cost and Savings \$	\$553	\$299	\$255		
Navone Building	Existing Condition	Proposed System	Savings	Cost	PB
Soda Machine Power Consumption	100%	54%	-	\$578	2.3
Annual Op Cost	\$553	\$299	-		
Run Hours	8,760	8,760	-		
Annual Energy Consumption (kWh)	4,205	2,271	1,934		
Annual Cost and Savings \$	\$553	\$299	\$255		
Student Center	Existing Condition	Proposed System	Savings	Cost	PB
Soda Machine Power Consumption	100%	54%	-	\$1,156	2.3
Annual Op Cost	\$1,107	\$598	-		
Run Hours	8,760	8,760	-		
Annual Energy Consumption (kWh)	8,410	4,541	3,868		
Annual Cost and Savings \$	\$1,107	\$598	\$509		
University Center	Existing Condition	Proposed System	Savings	Cost	PB
Soda Machine Power Consumption	100%	54%	-	\$578	2.3
Annual Op Cost	\$553	\$299	-		
Run Hours	8,760	8,760	-		
Annual Energy Consumption (kWh)	4,205	2,271	1,934		
Annual Cost and Savings \$	\$553	\$299	\$255		



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #2:

DOMESTIC WATER HEATER TIMERS

Domestic Water Heater Timers

Gas Rate	\$0.948								
Electric Rate	\$0.132								
Building	Equipment	Quantity	Manfuacturer	Model Number	Fuel Type	Input Btu/h	Input Watts	Capacity (gallons)	Add Timer
Academic Building	DHW	1	Bradford White	M-I-20U5SS-12	Electric	N/A	1,500	19.9	Y
Admin Building	DHW	1	N/A	N/A	Electric	N/A	N/A	20	Y
Conference Center	DHW	1	PVI	500N225A-TP	Natural Gas	399,000	N/A	225	Y
Navone Center	DHW	1	A.O Smith	DSE30	Electric	N/A	12,000	30	N
Library	DHW	1	A.O Smith	Del-30-110	Electric	N/A	4,500	30	Y
Student Center	DHW	1	AO Smith	BTR-154-110	Natural Gas	154,000	N/A	81	Y
University Center	DHW	1	AO Smith	N/A	Electric	N/A	N/A	N/A	N

Pipe Heat Loss During Unoccupied Periods

Building	Equipment	Diameter (in)	Length (ft)	Pipe Surface Area (sq.ft.)	Pipe Temp (°F)	Interior Space Temp (°F)	Hours per Year	Pipe Material	Emissivity	Estimated Insulation Thickness (in)	Insulated Pipe Thermal Conductivity (Btu-in/hr/ft^2/°F)	Heat Loss (BTU/hr/ft)	Energy Savings (MBTU/yr)	Energy Savings Gas (therms/yr)	Energy Savings Electricity (kWh/yr)
Academic Building	DHW Pipe	0.75	50	9.8	140	75	2,236	Copper	0.44	0.5	0.27	8.9	994	0	291
Admin Building	DHW Pipe	0.75	100	19.6	140	75	2,236	Copper	0.44	0.5	0.27	8.9	1,988	20	0
Conference Center	DHW Pipe	0.75	250	49.1	140	75	2,236	Copper	0.44	0.5	0.27	8.9	4,970	50	0
Library	DHW Pipe	0.75	100	19.6	140	75	2,236	Copper	0.44	0.5	0.27	8.9	1,988	0	583
Student Center	DHW Pipe	0.75	250	49.1	140	75	2,236	Copper	0.44	0.5	0.27	8.9	4,970	50	0
Total													14,909	119	874

r1	r2	ln(r2/r1)
0.4	0.9	0.8
0.4	0.9	0.8
0.4	0.9	0.8
0.4	0.9	0.8
0.4	0.9	0.8
0.4	0.9	0.8

Material	Emissivity
Brass	0.05
Copper	0.44
Steel	0.94

Domestic Water Heater Timers

DWH Circulator Timer Savings								
Estimated Circulator Power Watts	Hours Savings	kWh Savings	Number of Timers	Total kWh savings	Total Savings \$	Cost Each	Cost Total	
50	2236	111.8	5	559	73.5085	\$300	\$1,500	

Total Savings kWh	Total Savings Therms	Total Savings \$	Total Cost \$	Total Incentives \$	Total Cost After Incentives \$
1,433	119	\$301	\$1,500	\$0	\$1,500

	Savings kWh	Savings Therms	Savings \$	Incentives	Cost		PB
Academic Building	403	0	\$53	\$0	\$600	\$600	11.3
Admin Building	112	20	\$34	0	\$300	\$300	8.9
Conference Center	112	50	\$62	0	\$300	\$300	4.9
Library	694	0	\$91	0	\$300	\$300	3.3
Student Center	112	50	\$62	0	\$300	\$300	4.9
	1433	119	\$301		\$1,800		



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #3:

COMPUTER POWER MANAGEMENT

Network Computer Power Management System				
School	Number of Computers	Electric Savings, kWh	Savings, \$	Cost, \$
Library	118	4,130	\$544	3,540
University Center	27	945	\$124	810
Academic Building	320	11,200	\$1,474	9,600
Luciano Center	27	945	\$124	810
Administration Building	34	1,190	\$157	1,020
Navone Health Care	60	2,100	\$276	1,800
Student Services	96	3,360	\$442	2,880
Service Center	7	245	\$32	210
Total	689	24,115	\$3,174	20,670

Average Total Consumption per PC per Year	500	kWh
Average Energy and Cost Waste per PC per Year	350	kWh
Average savings per PC	70	kWh
Average savings per Imac	50	kWh
Diversity Factor	50%	

Price of Electricity \$/kWh	0.1316
Cost of Each Unit, \$	30



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #4:

LIGHTING EQUIPMENT AND CONTROL UPGRADES



LIGHTING RETROFIT SUMMARY FOR: Academic Building 3322 College Dr. Vineland, NJ 08630

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS						FINANCIAL						
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTION	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Academic Building	47,818	737	52,502	132,490	1.10	737	39,247	100,525	0.82	13,255	31,966	7,692	39,658	\$3,956	\$952	\$4,907	10.6	\$7,775	\$31,849	\$13,050	\$44,899	7.6

17%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
76%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
13%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
10%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER: Cumberland County College								FACILITY SQ. FT. 47,818				DATE OF AUDIT: 7/11/2013			
	FACILITY: Academic Building															

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							910									910								\$0.124			
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	First Flr	Office North 1	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,070	1,071	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	300	Ceiling	1	378	1,770	782	669	23	139	300	288	113	\$50	\$324	\$250	\$479
2	First Flr	Office North 2	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
3	First Flr	Office North 3	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
4	First Flr	Reception	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,070	714	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	0		0	252	2,070	522	522	23	93	0	192	0	\$24	\$216	\$0	\$176
5	First Flr	Storage	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	360	93	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	63	0		0	189	360	68	68	23	69	0	25	0	\$3	\$162	\$0	\$132
6	First Flr	Vestibule	2'x2' Recessed Troffer, No Lens, w/ (2) F8032T8/835, 32w 800 Lamps & (1) Electronic Ballast	6	65	390	4,680	1,825	New 2'x2' Recessed Troffer, silver reflectors, no Lens, w/ (3) F17T8.17w 800 Lamps & (1) Electronic Ballast	6	48	0		0	288	4,680	1,348	1,348	17	102	0	477	0	\$59	\$720	\$0	\$720
7	First Flr	Copy Rm	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	356	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	0		0	126	2,070	261	261	23	46	0	95	0	\$12	\$108	\$0	\$88
8	First Flr	Conference Center	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,070	714	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	0		0	252	2,070	522	522	23	93	0	192	0	\$24	\$216	\$0	\$176
9	First Flr	Classroom 12	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	86	862	2,300	1,983	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	10	63	300	Ceiling	1	630	2,000	1,449	1,260	23	232	300	534	189	\$89	\$540	\$250	\$655
10	First Flr	Classroom 13	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,300	1,784	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	2,000	1,304	1,134	23	209	300	480	170	\$80	\$486	\$250	\$611
11	First Flr	Classroom 13	4' Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, No Lens	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
12	First Flr	Classroom 14	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,300	1,784	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	2,000	1,304	1,134	23	209	300	480	170	\$80	\$486	\$250	\$611
13	First Flr	Classroom 14	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
14	First Flr	Classroom 15	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,300	1,784	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	2,000	1,304	1,134	23	209	300	480	170	\$80	\$486	\$250	\$611
15	First Flr	Classroom 15	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
16	First Flr	Classroom 16	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,300	1,784	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	2,000	1,304	1,134	23	209	300	480	170	\$80	\$486	\$250	\$611
17	First Flr	Classroom 16	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
18	First Flr	Office West 1	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
19	First Flr	Office West 2	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
20	First Flr	Office West 3	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,070	714	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	300	Ceiling	1	252	1,770	522	446	23	93	300	192	76	\$33	\$216	\$250	\$391
21	First Flr	Office West 4	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
22	First Flr	Office West 5	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
23	First Flr	Office West 6	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,070	1,071	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	300	Ceiling	1	378	1,770	782	669	23	139	300	288	113	\$50	\$324	\$250	\$479
24	First Flr	Electrical Rm	4' Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, No Lens	2	62	124	1,149	142	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	0		0	84	1,149	97	97	20	40	0	46	0	\$6	\$100	\$0	\$80
25	First Flr	Electrical Rm	1'x4' Pendant Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	1,149	142	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	0		0	84	1,149	97	97	20	40	0	46	0	\$6	\$100	\$0	\$80
26	First Flr	Closet	4' Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, No Lens	2	62	124	360	45	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	0		0	84	360	30	30	20	40	0	14	0	\$2	\$100	\$0	\$80
27	First Flr	Classroom 10	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,293	2,300	2,974	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	15	63	0		0	945	2,300	2,174	2,174	23	348	0	800	0	\$99	\$810	\$0	\$660
28	First Flr	Classroom 10	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	300	Ceiling	1	126	2,000	290	252	20	60	300	138	38	\$22	\$150	\$250	\$335
29	First Flr	Vestibule	Screw-in Compact Fluorescent Lamp (23W)	1	52	52	4,680	243	None	1	52	0		0	52	4,680	243	243	0	0	0	0	0	\$0	\$0	\$0	\$0
30	First Flr	Vestibule	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	1	52	52	4,680	243	None	1	52	0		0	52	4,680	243	243	0	0	0	0	0	\$0	\$0	\$0	\$0
31	First Flr	Classroom 11	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,300	1,784	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	2,000	1,304	1,134	23	209	300	480	170	\$80	\$486	\$250	\$611
32	First Flr	Classroom 11	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
33	First Flr	Office West 7	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
34	First Flr	Office West 8	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER: Cumberland County College						FACILITY SQ. FT. 47,818			DATE OF AUDIT: 7/11/2013		
	FACILITY: Academic Building											

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							910									910								\$0.124			
35	First Flr	Office West 9	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
36	First Flr	Office West 10	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
37	First Flr	Office West 11	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
38	First Flr	Office West 12	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
39	First Flr	Office West 13	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
40	First Flr	Office West 14	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
41	First Flr	Office West 15	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
42	First Flr	Office West 16	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
43	First Flr	Reception	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,070	714	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	0		0	252	2,070	522	522	23	93	0	192	0	\$24	\$216	\$0	\$176
44	First Flr	Office West 17	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
45	First Flr	Office West 18	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
46	First Flr	Office West 19	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
47	First Flr	Corridor near West Offices	2'x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T5HO, 24w 800 Lamp & (1) Electronic Ballast	6	28	168	4,680	786	None	6	28	0		0	168	4,680	786	786	0	0	0	0	0	\$0	\$0	\$0	\$0
48	First Flr	Vestibule	Screw-in Compact Fluorescent Lamp (23W)	2	52	104	4,680	487	None	2	52	0		0	104	4,680	487	487	0	0	0	0	0	\$0	\$0	\$0	\$0
49	First Flr	Vestibule	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	1	52	52	4,680	243	None	1	52	0		0	52	4,680	243	243	0	0	0	0	0	\$0	\$0	\$0	\$0
50	First Flr	Lecture Hall 1	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,293	2,070	2,677	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	15	63	0		0	945	2,070	1,956	1,956	23	348	0	720	0	\$89	\$810	\$0	\$660
51	First Flr	Lecture Hall 1	14W LED Recessed Downlights	16	14	224	2,070	464	None	16	14	0		0	224	2,070	464	464	0	0	0	0	0	\$0	\$0	\$0	\$0
52	First Flr	Men Restroom	1'x4' Pendant strip with matte reflector, No Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	2	92	184	3,500	644	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	2	84	300	Wall	1	168	3,200	588	538	8	16	300	56	50	\$13	\$116	\$120	\$196
53	First Flr	Men Restroom	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	3	52	156	3,500	546	None	3	52	0			156	3,500	546	546	0	0	0	0	0	\$0	\$0	\$0	\$0
54	First Flr	Women Restroom	1'x4' Pendant strip with matte reflector, No Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	2	92	184	3,500	644	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	2	84	300	Wall	1	168	3,200	588	538	8	16	300	56	50	\$13	\$116	\$120	\$196
55	First Flr	Women Restroom	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	3	52	156	3,500	546	None	3	52	0		0	156	3,500	546	546	0	0	0	0	0	\$0	\$0	\$0	\$0
56	First Flr	Staff Restroom	2'x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	107	427	3,500	1,494	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	4	84	300	Wall	1	336	3,200	1,176	1,075	23	91	300	318	101	\$52	\$232	\$120	\$292
57	First Flr	Lecture Hall 2	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,293	2,070	2,677	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	15	63	0		0	945	2,070	1,956	1,956	23	348	0	720	0	\$89	\$810	\$0	\$660
58	First Flr	Lecture Hall 2	14W LED Recessed Downlights	26	14	364	2,070	753	None	26	14	0		0	364	2,070	753	753	0	0	0	0	0	\$0	\$0	\$0	\$0
59	First Flr	Corridor Main	2'x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T5HO, 24w 800 Lamp & (1) Electronic Ballast	31	28	868	4,680	4,062	None	31	28	0		0	868	4,680	4,062	4,062	0	0	0	0	0	\$0	\$0	\$0	\$0
60	First Flr	Corridor South	2'x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T5HO, 24w 800 Lamp & (1) Electronic Ballast	5	28	140	4,680	655	None	5	28	0		0	140	4,680	655	655	0	0	0	0	0	\$0	\$0	\$0	\$0
61	First Flr	Corridor North	2'x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T5HO, 24w 800 Lamp & (1) Electronic Ballast	5	28	140	4,680	655	None	5	28	0		0	140	4,680	655	655	0	0	0	0	0	\$0	\$0	\$0	\$0
62	First Flr	Corridor South Wing	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	19	86	1,638	4,680	7,665	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	19	63	0		0	1,197	4,680	5,602	5,602	23	441	0	2,063	0	\$255	\$1,026	\$0	\$836
63	First Flr	Computer Lab S1	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	16	86	1,379	2,688	3,707	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	16	63	300	Ceiling	1	1,008	2,388	2,710	2,407	23	371	300	998	302	\$161	\$864	\$250	\$919
64	First Flr	Computer Lab S2	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,293	2,688	3,476	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	15	63	300	Ceiling	1	945	2,388	2,540	2,257	23	348	300	935	284	\$151	\$810	\$250	\$875
65	First Flr	Computer Lab S3	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,688	2,780	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	12	63	300	Ceiling	1	756	2,388	2,032	1,805	23	278	300	748	227	\$121	\$648	\$250	\$743
66	First Flr	Storage	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	360	93	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	63	0		0	189	360	68	68	23	69	0	25	0	\$3	\$162	\$0	\$132
67	First Flr	Computer Lab N1	1'x4' Pendant Direct/indirect Fixture, w/ (3) F32T8 700 Lamps & (1) Electronic Ballast	10	86	860	2,688	2,312	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	10	63	300	Ceiling	1	630	2,388	1,693	1,504	23	230	300	618	189	\$100	\$540	\$250	\$655
68	First Flr	Computer Lab N2	1'x4' Pendant Direct/indirect Fixture, w/ (3) F32T8 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,688	3																			



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER: Cumberland County College						FACILITY SQ. FT. 47,818				DATE OF AUDIT: 7/11/2013			
	FACILITY: Academic Building													

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							910									910		\$0.124									
69	First Flr	Computer Lab N3	1'x4' Pendant Direct/indirect Fixture, w/ (3) F32T8 700 Lamps & (1) Electronic Ballast	15	86	1,290	2,688	3,468	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	15	63	300	Ceiling	1	945	2,388	2,540	2,257	23	345	300	927	284	\$150	\$810	\$250	\$875
70	First Flr	Computer Lab N4	1'x4' Pendant Direct/indirect Fixture, w/ (3) F32T8 700 Lamps & (1) Electronic Ballast	10	86	860	2,688	2,312	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	10	63	300	Ceiling	1	630	2,388	1,693	1,504	23	230	300	618	189	\$100	\$540	\$250	\$655
71	Second Flr	Classroom 20	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,300	2,379	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	12	63	300	Ceiling	1	756	2,000	1,739	1,512	23	278	300	640	227	\$107	\$648	\$250	\$743
72	Second Flr	Classroom 20	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42				126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
73	Second Flr	Classroom 21	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,300	1,784	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	2,000	1,304	1,134	23	209	300	480	170	\$80	\$486	\$250	\$611
74	Second Flr	Classroom 21	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
75	Second Flr	Classroom 22	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,300	1,784	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	2,000	1,304	1,134	23	209	300	480	170	\$80	\$486	\$250	\$611
76	Second Flr	Classroom 22	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
77	Second Flr	Classroom 23	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,300	2,379	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	12	63	300	Ceiling	1	756	2,000	1,739	1,512	23	278	300	640	227	\$107	\$648	\$250	\$743
78	Second Flr	Classroom 23	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
79	Second Flr	Classroom 24	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,293	2,300	2,974	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	15	63	300	Ceiling	1	945	2,000	2,174	1,890	23	348	300	800	284	\$134	\$810	\$250	\$875
80	Second Flr	Classroom 24	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	300	Ceiling	1	126	2,000	290	252	20	60	300	138	38	\$22	\$150	\$250	\$335
81	Second Flr	Computer Rm	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,688	2,085	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	2,388	1,524	1,354	23	209	300	561	170	\$91	\$486	\$250	\$611
82	Second Flr	Computer Rm	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,688	500	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	300	Ceiling	1	126	2,388	339	301	20	60	300	161	38	\$25	\$150	\$250	\$335
83	Second Flr	Classroom 25	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,293	2,300	2,974	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	15	63	300	Ceiling	1	945	2,000	2,174	1,890	23	348	300	800	284	\$134	\$810	\$250	\$875
84	Second Flr	Classroom 25	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
85	Second Flr	Vestibule	2'x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T5HO, 24w 800 Lamp & (1) Electronic Ballast	1	28	28	4,680	131	None	1	28	0		0	28	4,680	131	131	0	0	0	0	0	\$0	\$0	\$0	\$0
86	Second Flr	Classroom 26	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,300	2,379	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	12	63	300	Ceiling	1	756	2,000	1,739	1,512	23	278	300	640	227	\$107	\$648	\$250	\$743
87	Second Flr	Classroom 26	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
88	Second Flr	Classroom 27	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,300	1,784	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	2,000	1,304	1,134	23	209	300	480	170	\$80	\$486	\$250	\$611
89	Second Flr	Classroom 27	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
90	Second Flr	Classroom 28	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,300	1,784	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	2,000	1,304	1,134	23	209	300	480	170	\$80	\$486	\$250	\$611
91	Second Flr	Classroom 28	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
92	Second Flr	Classroom 29	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,300	2,379	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	12	63	300	Ceiling	1	756	2,000	1,739	1,512	23	278	300	640	227	\$107	\$648	\$250	\$743
93	Second Flr	Classroom 29	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,300	428	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	2,300	290	290	20	60	0	138	0	\$17	\$150	\$0	\$120
94	Second Flr	Vestibule	2'x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T5HO, 24w 800 Lamp & (1) Electronic Ballast	1	28	28	4,680	131	None	1	28	0		0	28	4,680	131	131	0	0	0	0	0	\$0	\$0	\$0	\$0
95	Second Flr	Office 23.15	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	690	2,070	1,427	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	1,770	1,043	892	23	186	300	384	151	\$66	\$432	\$250	\$567
96	Second Flr	Reception	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,070	1,606	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	0		0	567	2,070	1,174	1,174	23	209	0	432	0	\$53	\$486	\$0	\$396
97	Second Flr	Office 23.16	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	690	2,070	1,427	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	1,770											



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER:	Cumberland County College	FACILITY SQ. FT.	DATE OF AUDIT:
	FACILITY:	Academic Building	47,818	7/11/2013

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
							910									910								\$0.124			
103	Second Flr	Office 23.5	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
104	Second Flr	Office 23.6	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
105	Second Flr	Office 23.7	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
106	Second Flr	Office 23.8	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
107	Second Flr	Office 23.9	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
108	Second Flr	Office 23.10	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
109	Second Flr	Office 23.10	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	0		0	126	2,070	261	261	23	46	0	96	0	\$12	\$108	\$0	\$88
110	Second Flr	Office 23.10	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	0		0	126	2,070	261	261	23	46	0	96	0	\$12	\$108	\$0	\$88
111	Second Flr	Office 23.10	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	0		0	126	2,070	261	261	23	46	0	96	0	\$12	\$108	\$0	\$88
112	Second Flr	Office 23.11	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
113	Second Flr	Office 23.12	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
114	Second Flr	Office 23.13	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
115	Second Flr	Office 23.14	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
116	Second Flr	Corridor near West Offices	2'x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T5HO, 24w 800 Lamp & (1) Electronic Ballast	10	28	280	2,070	580	None	10	28	0		0	280	2,070	580	580	0	0	0	0	0	\$0	\$0	\$0	\$0
117	Second Flr	Staff Lounge	2'x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T5HO, 24w 800 Lamp & (1) Electronic Ballast	8	28	224	2,070	464	None	8	28	0		0	224	2,070	464	464	0	0	0	0	0	\$0	\$0	\$0	\$0
118	Second Flr	Men Restroom	1'x4' Pendant strip with matte reflector, No Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	2	92	184	3,566	656	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	2	84	300	Wall	1	168	3,266	599	549	8	16	300	57	50	\$13	\$116	\$120	\$196
119	Second Flr	Men Restroom	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	3	52	156	3,566	556	None	3	52	0		0	156	3,566	556	556	0	0	0	0	0	\$0	\$0	\$0	\$0
120	Second Flr	Women Restroom	1'x4' Pendant strip with matte reflector, No Lens, w/ (4) F32T8/32w 800 Lamps & (1) Electronic Ballast	2	92	184	3,566	656	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	2	84	300	Wall	1	168	3,266	599	549	8	16	300	57	50	\$13	\$116	\$120	\$196
121	Second Flr	Women Restroom	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	3	52	156	3,566	556	None	3	52	0		0	156	3,566	556	556	0	0	0	0	0	\$0	\$0	\$0	\$0
122	Second Flr	Mechanical Rm	4' Fluorescent Recessed Strip with (2) F32T12 700 Lamps & (1) Energy Saving Magnetic Ballast	6	73	438	2,070	907	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	6	42	0		0	252	2,070	522	522	31	186	0	385	0	\$48	\$300	\$0	\$240
123	Second Flr	Multimedia Rm	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,070	534	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	63	0		0	189	2,070	391	391	23	69	0	143	0	\$18	\$162	\$0	\$132
124	Second Flr	Multimedia Rm	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,070	1,071	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	300	Wall	1	378	1,770	782	669	23	139	300	288	113	\$50	\$324	\$120	\$364
125	Second Flr	Office	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188
126	Second Flr	Copy Rm	1'x4' Recessed Fixture, silver reflector, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	2,300	143	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	1	42	0		0	42	2,300	97	97	20	20	0	46	0	\$6	\$50	\$0	\$40
127	Second Flr	TV Studio	1'x4' Pendant Fixture with w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast, Wireguard	6	62	372	2,070	770	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	42	0		0	252	2,070	522	522	20	120	0	248	0	\$31	\$300	\$0	\$240
128	Second Flr	Corridor	2'x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T5HO, 24w 800 Lamp & (1) Electronic Ballast	31	28	868	4,680	4,062	None	31	28	0		0	868	4,680	4,062	4,062	0	0	0	0	0	\$0	\$0	\$0	\$0
129	Second Flr	Exterior	75W Recessed incandescent canopy lighting	4	65	260	4,368	1,136	Relamp 18 Watt LED Lamp	4	18	0		0	72	4,368	314	314	47	188	0	821	0	\$102	\$400	\$0	\$320
130	Second Flr	Exterior	Wall pack-100W incandescent	1	100	100	4,368	437	42 Watt LED Wall Pack	1	42	0		0	42	4,368	183	183	58	58	0	253	0	\$31	\$235	\$0	\$185
				737		52,502		132,490		737				73	39,247		100,525	92,832				31,966	7,692	\$4,907	\$31,849	\$13,050	\$37,124



LIGHTING RETROFIT SUMMARY FOR:
Administration Building
3322 College Dr. Vineland, NJ 08630

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL					
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTI ON	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSOR S	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Administration Building	9,202	161	12,558	26,809	1.36	161	7,816	16,820	0.85	4,742	9,989	2,032	12,021	\$1,368	\$278	\$1,646	3.3	\$2,385	\$8,150	\$5,930	\$14,080	7.1

17%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
63%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
13%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
8%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		CUSTOMER: FACILITY:				Cumberland County College Administration Building				FACILITY SQ. FT. 9,202				DATE OF AUDIT: 7/11/2013												
						REPLACEMENT FIXTURES												ENERGY ANALYSIS						COST ANALYSIS		
PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES		
				910									910		\$0.137											
4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	4	73	292	2,070	604	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	4	42	300	Ceiling	1	168	1,770	348	297	31	124	300	257	50	\$42	\$200	\$250	\$375		
2'x4" Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	690	2,070	1,427	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	1,770	1,043	892	23	186	300	384	151	\$73	\$432	\$250	\$567		
2'x4" Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	690	2,070	1,427	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	1,770	1,043	892	23	186	300	384	151	\$73	\$432	\$250	\$567		
4' Vanity fixture, w/ (2) F32T8/32W Lamp and Electronic ballas	4	62	248	2,610	647	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	4	42	300	Ceiling	1	168	2,310	438	388	20	80	300	209	50	\$35	\$200	\$250	\$415		
2'x4" Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,070	2,141	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	12	63	300	Ceiling	1	756	1,770	1,565	1,338	23	278	300	576	227	\$110	\$648	\$250	\$743		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	6	73	438	2,070	907	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	6	42	300	Ceiling	1	252	1,770	522	446	31	186	300	385	76	\$63	\$300	\$250	\$455		
1'x4" Pendant Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,070	385	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	3	42	300	Wall	1	126	1,770	261	223	20	60	300	124	38	\$22	\$150	\$120	\$220		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	4	73	292	2,070	604	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	4	42	300	Ceiling	1	168	1,770	348	297	31	124	300	257	50	\$42	\$200	\$250	\$375		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	4	73	292	2,070	604	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	4	42	300	Ceiling	1	168	1,770	348	297	31	124	300	257	50	\$42	\$200	\$250	\$375		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	4	73	292	2,070	604	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	4	42	300	Ceiling	1	168	1,770	348	297	31	124	300	257	50	\$42	\$200	\$250	\$375		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	11	73	803	2,070	1,662	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	11	42	300	Ceiling	1	462	1,770	956	818	31	341	300	706	139	\$116	\$550	\$250	\$655		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	4	73	292	2,070	604	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	4	42	300	Ceiling	1	168	1,770	348	297	31	124	300	257	50	\$42	\$200	\$250	\$375		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	10	73	730	2,070	1,511	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	10	42	300	Ceiling	1	420	1,770	869	743	31	310	300	642	126	\$105	\$500	\$250	\$615		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	6	73	438	2,070	907	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	6	42	300	Ceiling	1	252	1,770	522	446	31	186	300	385	76	\$63	\$300	\$250	\$455		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	4	73	292	2,070	604	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	4	42	300	Ceiling	1	168	1,770	348	297	31	124	300	257	50	\$42	\$200	\$250	\$375		
2'x4" Recessed Direct/indirect Fixture, w/ (2) F40TTL/40w 4-pin CFL & (1) Electronic Ballast	2	80	160	4,380	701	None	2	80	0		0	160	4,380	701	701	0	0	0	0	0	\$0	\$0	\$0	\$0		
2'x4" Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,070	1,071	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	300	Ceiling	1	378	1,770	782	669	23	139	300	288	113	\$55	\$324	\$250	\$479		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,070	302	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	1,770	174	149	31	62	300	128	25	\$21	\$100	\$120	\$180		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,070	302	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	1,770	174	149	31	62	300	128	25	\$21	\$100	\$120	\$180		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	4	73	292	2,070	604	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	4	42	300	Ceiling	1	168	1,770	348	297	31	124	300	257	50	\$42	\$200	\$250	\$375		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,070	302	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	1,770	174	149	31	62	300	128	25	\$21	\$100	\$120	\$180		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,070	302	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	1,770	174	149	31	62	300	128	25	\$21	\$100	\$120	\$180		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	10	73	730	2,070	1,511	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	10	42	300	Ceiling	1	420	1,770	869	743	31	310	300	642	126	\$105	\$500	\$250	\$615		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,070	302	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	1,770	174	149	31	62	300	128	25	\$21	\$100	\$120	\$180		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,070	302	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	1,770	174	149	31	62	300	128	25	\$21	\$100	\$120	\$180		
1'x4" Recessed Troffer, Prismatic Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	21	73	1,533	2,070	3,173	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	21	42	0		0	882	2,070	1,826	1,826	31	651	0	1,348	0	\$185	\$1,050	\$0	\$840		
1'x4" Pendant strip, No Lens, w/ (2) F32T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,070	302	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	1,770	174	149	31	62	300	128	25	\$21	\$100	\$120	\$180		
1'x4" Pendant strip, No Lens, w/ (2) F32T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,070	302	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	1,770	174	149	31	62	300	128	25	\$21	\$100	\$120	\$180		
1'x4" Pendant strip, No Lens, w/ (2) F32T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,070	302	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	73	1,770	151	129	31	62	300	128	22	\$21	\$100	\$120	\$180		
2'x4" Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	107	213	2,070	442	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	2	84	300	Wall	1	107	1,770	221	189	23	45	300	94	32	\$17	\$116	\$120	\$196		
2'x4" Recessed Troffer, Prismatic Lens																										



LIGHTING RETROFIT SUMMARY FOR: **Luciano Conference Center** **3322 College Dr. Vineland, NJ 08630**

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL					
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTION	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Luciano Conference Center	23,212	426	19,358	52,760	0.83	334	16,863	46,579	0.73	2,495	6,181	3,446	9,627	\$765	\$426	\$1,191	2.0	\$935	\$5,618	\$2,750	\$8,368	6.2

11%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
88%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
10%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
9%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		CUSTOMER: FACILITY:		Cumberland County College Luciano Conference Center		FACILITY SQ. FT. 23,212		DATE OF AUDIT: 7/11/2013	
--	--	------------------------	--	--	--	----------------------------	--	-----------------------------	--

SPACE DESCRIPTION									REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.124	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	First Floor	Office Executive Board Room 136	2x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T8HO, 24w 800 Lamp & (1) Electronic Ballast	12	28	336	1,885	633	None	12	28	300	Ceiling	1	336	1,585	633	533	0	0	300	0	101	\$12	\$0	\$250	\$215
2	First Floor	Office 134	Recessed round fixture w/ (2) 26W Compact Fluorescent Lamp (CFL), No Lens	18	52	936	2,070	1,938	None	18	52	300	Ceiling	1	936	1,770	1,938	1,657	0	0	300	0	281	\$35	\$0	\$250	\$215
3	First Floor	Forum Room	2x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T8HO, 24w 800 Lamp & (1) Electronic Ballast	18	28	504	1,885	950	None	18	28	300	Ceiling	1	504	1,585	950	799	0	0	300	0	151	\$19	\$0	\$250	\$215
4	First Floor	Forum Room	Recessed round fixture w/ (2) 26W Compact Fluorescent Lamp (CFL), No Lens	14	52	728	1,885	1,372	None	14	52	300	Ceiling	1	728	1,585	1,372	1,154	0	0	300	0	218	\$27	\$0	\$250	\$215
5	First Floor	Office 130	2x4' Recessed Troffer, No Lens, w/ (3) F32T9/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,070	2,141	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	12	63	300	Ceiling	1	756	1,770	1,565	1,338	23	278	300	576	227	\$99	\$648	\$250	\$743
6	First Floor	Server Room 131	2x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T9/32w 700 Lamps & (1) Electronic Ballast	2	62	124	4,380	543	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	0		0	84	4,380	368	368	20	40	0	175	0	\$22	\$100	\$0	\$100
7	First Floor	Office 126	2x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T9/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,070	257	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Ceiling	1	84	1,770	174	149	20	40	300	83	25	\$13	\$100	\$250	\$315
8	First Floor	Office 127	2x4' Recessed Troffer, No Lens, w/ (3) F32T9/32w 700 Lamps & (1) Electronic Ballast	9	86	776	2,070	1,606	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	1,770	1,174	1,004	23	209	300	432	170	\$75	\$486	\$250	\$611
9	First Floor	Office 123	2x4' Recessed Troffer, No Lens, w/ (3) F32T9/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Ceiling	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$250	\$303
10	First Floor	Meeting Room 114	2x4' Recessed Troffer, No Lens, w/ (3) F32T9/32w 700 Lamps & (1) Electronic Ballast	6	86	517	1,885	975	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	0		0	378	1,885	713	713	23	139	0	262	0	\$32	\$324	\$0	\$264
11	First Floor	Meeting Room 115	2x4' Recessed Troffer, No Lens, w/ (3) F32T9/32w 700 Lamps & (1) Electronic Ballast	6	86	517	1,885	975	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	0		0	378	1,885	713	713	23	139	0	262	0	\$32	\$324	\$0	\$264
12	First Floor	Meeting Room 116	2x4' Recessed Troffer, No Lens, w/ (3) F32T9/32w 700 Lamps & (1) Electronic Ballast	6	86	517	1,885	975	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	0		0	378	1,885	713	713	23	139	0	262	0	\$32	\$324	\$0	\$264
13	First Floor	Storage 117	2x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T9/32w 700 Lamps & (1) Electronic Ballast	6	62	372	360	134	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	6	42	0		0	252	360	91	91	20	120	0	43	0	\$5	\$300	\$0	\$300
14	First Floor	Corridor by meeting room	2x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T9/32w 700 Lamps & (1) Electronic Ballast	8	62	496	1,885	935	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	42	0		0	336	1,885	633	633	20	160	0	302	0	\$37	\$400	\$0	\$400
15	First Floor	Vestibule	2x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T9/32w 700 Lamps & (1) Electronic Ballast	3	62	186	4,680	870	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	42	0		0	126	4,680	590	590	20	60	0	281	0	\$35	\$150	\$0	\$150
16	First Floor	Kitchen Area	2x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T9/32w 700 Lamps & (1) Electronic Ballast	13	107	1,387	4,380	6,075	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	13	84	300	Ceiling	1	1,092	4,080	4,783	4,455	23	295	300	1,293	328	\$200	\$754	\$250	\$839
17	First Floor	Banquet Room	Recessed round fixture w/ (2) 26W Compact Fluorescent Lamp (CFL), No Lens	16	52	832	1,885	1,568	None	16	52	0		0	832	1,885	1,568	1,568	0	0	0	0	0	\$0	\$0	\$0	\$0
18	First Floor	Banquet Room	Recessed round fixture, No lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	36	26	936	1,885	1,764	None	36	26	0		0	936	1,885	1,764	1,764	0	0	0	0	0	\$0	\$0	\$0	\$0
19	First Floor	Banquet Room	Architectural Pendant w/ Direct Indirect Fixture w/ (4) 26W Compact Fluorescent Lamp (CFL)	24	104	2,496	1,885	4,705	None	24	104	0		0	2,496	1,885	4,705	4,705	0	0	0	0	0	\$0	\$0	\$0	\$0
20	First Floor	Entrance	Recessed round fixture, w/ (2) 13W Compact Fluorescent Lamp (CFL), No Lens	12	26	312	4,680	1,460	None	12	26	0		0	312	4,680	1,460	1,460	0	0	0	0	0	\$0	\$0	\$0	\$0
21	First Floor	Closet	1x4' Pendant Fixture, No Lens, w/ (2) F32T9/32w 700 Lamps & (1) Electronic Ballast	1	62	62	360	22	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	1	42	0		0	42	360	15	15	20	20	0	7	0	\$1	\$50	\$0	\$40
22	First Floor	Men Restroom	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	2	52	104	2,610	271	None	2	52	300	Ceiling	1	104	2,310	271	240	0	0	300	0	31	\$4	\$0	\$250	\$215
23	First Floor	Men Restroom	2x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T9/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,610	324	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	0		0	84	2,610	219	219	20	40	0	104	0	\$13	\$100	\$0	\$100
24	First Floor	Women Restroom	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	2	52	104	2,610	271	None	2	52	300	Ceiling	1	104	2,310	271	240	0	0	300	0	31	\$4	\$0	\$250	\$215
25	First Floor	Women Restroom	2x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T9/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,610	324	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	2	42	0		0	84	2,610	219	219	20	40	0	104	0	\$13	\$100	\$0	\$100
26	First Floor	Cost Check 122	Recessed round fixture w/ (2) 26W Compact Fluorescent Lamp (CFL), No Lens	6	52	312	4,680	1,460	None	6	52	0		0	312	4,680	1,460	1,460	0	0	0	0	0	\$0	\$0	\$0	\$0
27	First Floor	Corridor 126	Recessed round fixture w/ (2) 26W Compact Fluorescent Lamp (CFL), No Lens	35	52	1,820	4,680	8,518	None	35	52	0		0	1,820	4,680	8,518	8,518	0	0	0	0	0	\$0	\$0	\$0	\$0
28	First Floor	Atrium	Recessed round fixture, No lens w/ (2) 32W Compact Fluorescent Lamp (CFL)	9	64	576	4,680	2,696	None	9	64	0		0	576	4,680	2,696	2,696	0	0	0	0	0	\$0	\$0	\$0	\$0
29	First Floor	Atrium	Architectural Pendant w/ Direct Indirect Fixture w/ (4) 26W Compact Fluorescent Lamp (CFL)	5	104	520	4,680	2,434	None	5	104	0		0	520	4,680	2,434	2,434	0	0	0	0	0	\$0	\$0	\$0	\$0
30	First Floor	Atrium	Wall Sconce w/ acrylic lens w/ (2) 13W Compact Fluorescent Lamp (CFL)	5	26	130	4,680	608	None	5	26	0		0	130	4,680	608	608	0	0	0	0	0	\$0	\$0	\$0	\$0
31	First Floor	Atrium	2x2' Recessed Direct/Indirect Fixture, w/ (1) FP24 T8HO, 24w 800 Lamp & (1) Electronic Ballast	8	28	224	4,680	1,048	None	8	28	0		0	224	4,680	1,048	1,048	0	0	0	0	0	\$0	\$0	\$0	\$0
32	First Floor	Mechanical Room	2x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T9/32w 700 Lamps & (1) Electronic Ballast	20	62	1,240	1,150	1,426	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	20	42	0		0	840	1,150	966	966	40	400	0	460	0	\$57	\$1,000	\$0	\$1,000
33	First Floor	Exterior	Exterior Light 80W Metal Halide	7	65	455	4,368	1,987	30 Watt LED Wall Pack	7	18	0		0	126	4,368	550	550	47	329	0	1,437	0	\$178	\$350	\$0	\$350
34	First Floor	Exterior	Recessed round fixture w/ (2) 26W Compact Fluorescent Lamp (CFL), No Lens	5	52	260	4,368	1,136	None	5	52	0		0	260	4,368	1,136	1,136	0	0	0	0	0	\$0	\$0	\$0	\$0
				426		19,358		52,760		334				11	16,863		46,579	44,978				6,181	3,446	\$963	\$5,618	\$2,750	\$7,433



LIGHTING RETROFIT SUMMARY FOR:

Library

3322 College Dr. Vineland, NJ 08630

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL					
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTION	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Library	17,590	332	27,820	70,913	1.58	332	20,198	51,060	1.15	7,622	19,852	1,392	21,245	\$2,457	\$172	\$2,629	6.6	\$3,375	\$17,922	\$2,110	\$20,032	6.3

17%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
72%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
18%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
13%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER:		Cumberland County College		FACILITY SQ. FT.		DATE OF AUDIT:	
	FACILITY:		Library		17,590		7/11/2013	

SPACE DESCRIPTION									REPLACEMENT FIXTURES											ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES	
							910																	910				\$0.124
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
1	First Floor	Entrance	Recessed round fixture w/ prismatic lens w/ (2) 13W Compact Fluorescent Lamp (CFL)	10	26	260	4,680	1,217	None	10	26	0		0	260	4,680	1,217	1,217	0	0	0	0	0	\$0	\$0	\$0	\$0	
2	First Floor	Storage	1x4' Pendant Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	360	22	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	1	42	0		0	42	360	15	15	20	20	0	7	0	\$1	\$50	\$0	\$40	
3	First Floor	Mechanical Rm	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	1,150	99	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	1	63	0		0	63	1,150	72	72	23	23	0	26	0	\$3	\$54	\$0	\$44	
4	First Floor	Mechanical Rm	1x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	1,150	143	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	0		0	84	1,150	97	97	20	40	0	46	0	\$6	\$100	\$0	\$80	
5	First Floor	Closet	1x4' Pendant Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	360	22	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	1	42	0		0	42	360	15	15	20	20	0	7	0	\$1	\$50	\$0	\$40	
6	First Floor	Office 1	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,500	645	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	63	300	Wall	1	189	2,200	473	416	23	69	300	173	57	\$28	\$162	\$120	\$232	
7	First Floor	Restroom	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,610	224	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	1	63				63	2,610	164	164	23	23	0	60	0	\$7	\$54	\$0	\$44	
8	First Floor	Reception	2x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	7	107	747	2,500	1,867	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	7	84				588	2,500	1,470	1,470	23	159	0	397	0	\$49	\$406	\$0	\$336	
9	First Floor	Office 2	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,500	862	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	300	Ceiling	1	252	2,200	630	554	23	93	300	232	76	\$38	\$216	\$250	\$391	
10	First Floor	Office 3	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	690	2,500	1,724	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	2,200	1,260	1,109	23	186	300	464	151	\$76	\$432	\$250	\$567	
11	First Floor	Main Area	2x4' Recessed Troffer, Prismatic Lens, w/ (4) F32T8/32w 700 Lamps & (1) Electronic Ballast	16	107	1,707	2,500	4,268	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	16	84				1,344	2,500	3,360	3,360	23	363	0	908	0	\$112	\$928	\$0	\$768	
12	First Floor	Main Area	1x4' Pendant Direct/Indirect Fixture, w/ (3) F32T8 700 Lamps & (1) Electronic Ballast	189	86	16,254	2,500	40,635	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	189	63				11,907	2,500	29,768	29,768	23	4,347	0	10,868	0	\$1,345	\$10,206	\$0	\$8,316	
13	First Floor	Main Area	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	86	862	2,500	2,155	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	10	63				630	2,500	1,575	1,575	23	232	0	580	0	\$72	\$540	\$0	\$440	
14	First Floor	Office 4	1x4' Pendant Direct/Indirect Fixture, w/ (3) F32T8 700 Lamps & (1) Electronic Ballast	16	86	1,376	2,500	3,440	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	16	63	300	Ceiling	1	1,008	2,200	2,520	2,218	23	368	300	920	302	\$151	\$864	\$250	\$919	
15	First Floor	Computer Rm	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	690	2,500	1,724	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	2,200	1,260	1,109	23	186	300	464	151	\$76	\$432	\$250	\$567	
16	First Floor	Study Room 1	2x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,500	310	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	2,200	210	185	20	40	300	100	25	\$15	\$100	\$120	\$200	
17	First Floor	Study Room 2	1x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,500	620	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	42				168	2,500	420	420	20	80	0	200	0	\$25	\$200	\$0	\$160	
18	First Floor	Study Room 3	2x4' Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,500	310	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	2,200	210	185	20	40	300	100	25	\$15	\$100	\$120	\$200	
19	First Floor	Study Room 4	1x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,500	620	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	42				168	2,500	420	420	20	80	0	200	0	\$25	\$200	\$0	\$160	
20	First Floor	Study Room 5	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,500	862	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	300	Ceiling	1	252	2,200	630	554	23	93	300	232	76	\$38	\$216	\$250	\$391	
21	First Floor	Study Room 6	1x4' Pendant Direct/Indirect Fixture, w/ (3) F32T8 700 Lamps & (1) Electronic Ballast	14	86	1,204	2,500	3,010	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	14	63	300	Ceiling	1	882	2,200	2,205	1,940	23	322	300	805	265	\$132	\$756	\$250	\$831	
22	First Floor	Study Room 7	1x4' Pendant Direct/Indirect Fixture, w/ (3) F32T8 700 Lamps & (1) Electronic Ballast	14	86	1,204	2,500	3,010	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	14	63	300	Ceiling	1	882	2,200	2,205	1,940	23	322	300	805	265	\$132	\$756	\$250	\$831	
23	First Floor	Exterior	70W Recessed incandescent canopy lighting	7	65	455	4,368	1,987	Relamp 18 Watt LED Lamp	7	18	0		0	126	4,368	550	550	47	329	0	1,437	0	\$178	\$700	\$0	\$560	
24	First Floor	Exterior	Exterior Light 60W Metal Halide	4	65	260	4,368	1,136	20 Watt LED Wall Pack	4	18	0		0	72	4,368	314	314	47	188	0	821	0	\$102	\$400	\$0	\$400	
				332		27,820		70,913		332				10	20,198		51,060	49,668				19,852	1,392	\$2,629	\$17,922	\$2,110	\$16,517	



LIGHTING RETROFIT SUMMARY FOR: Navone Healthcare Center 3322 College Dr. Vineland, NJ 08630

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL					
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTION	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Navone Healthcare Center	16,165	248	19,787	49,556	1.22	248	14,782	38,168	0.91	5,005	11,388	2,967	14,356	\$1,559	\$406	\$1,966	3.8	\$1,650	\$12,209	\$6,038	\$18,247	8.4

9%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
#####	
77%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
14%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
11%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL				CUSTOMER: FACILITY: Cumberland County College Navone Healthcare Center				FACILITY SQ. FT. 16,165				DATE OF AUDIT: 7/10/2013			
--	--	--	--	--	--	--	--	----------------------------	--	--	--	-----------------------------	--	--	--

SPACE DESCRIPTION										REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRI FIXTURE DESCRIPTION	PRI FIXT. QTY	PRI WATTS / FIXT.	PRI TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRI ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES	
							910																					
1		3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
1	First Floor	Classroom 1	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,290	2,369	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	12	63	300	Ceiling	1	756	1,990	1,731	1,504	23	278	300	638	227	\$118	\$648	\$250	\$743	
2	First Floor	Classroom 1	1x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,290	426	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	42	300	Wall	1	126	1,990	289	251	20	60	300	137	38	\$24	\$150	\$120	\$220	
3	First Floor	Nursing Lab 2	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	774	1,400	1,084	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	1,100	794	624	23	207	300	290	170	\$63	\$486	\$250	\$611	
4	First Floor	Nursing Lab 3	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	1,400	724	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	300	Ceiling	1	378	1,100	529	416	23	139	300	195	113	\$42	\$324	\$250	\$479	
5	First Floor	Nursing Lab 3	1x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	1,400	174	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	1,100	118	92	20	40	300	56	25	\$11	\$100	\$120	\$180	
6	First Floor	Nursing Lab 1	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	9	86	774	1,400	1,084	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	9	63	300	Ceiling	1	567	1,100	794	624	23	207	300	290	170	\$63	\$486	\$250	\$611	
7	First Floor	Control Room	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,070	534	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	63	300	Wall	1	189	1,770	391	335	23	69	300	143	57	\$27	\$162	\$120	\$232	
8	First Floor	Office 142	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
9	First Floor	Office 141	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
10	First Floor	Office 140	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
11	First Floor	Office 139	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
12	First Floor	Office 138	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
13	First Floor	Office 137	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
14	First Floor	Office 136	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
15	First Floor	Office 135	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
16	First Floor	Office 134	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
17	First Floor	Office 133	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
18	First Floor	Office 132	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
19	First Floor	Office 131	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
20	First Floor	Office 130	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
21	First Floor	Office 129	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,070	714	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	300	Ceiling	1	252	1,770	522	446	23	93	300	192	76	\$37	\$216	\$250	\$391	
22	First Floor	Radiology Tech. Storage	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	360	62	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	0		0	126	360	45	45	23	46	0	17	0	\$2	\$108	\$0	\$88	
23	First Floor	Copy Rm 121	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	356	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	95	38	\$18	\$108	\$120	\$188	
24	First Floor	Office 120	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,070	1,071	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	300	Ceiling	1	378	1,770	782	669	23	139	300	288	113	\$55	\$324	\$250	\$479	
25	First Floor	Radiography Lab 118	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	1,400	724	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	0		0	378	1,400	529	529	23	139	0	195	0	\$27	\$324	\$0	\$264	
26	First Floor	Computer Room 114	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	15	86	1,293	1,400	1,810	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	15	63	300	Ceiling	1	945	1,100	1,323	1,040	23	348	300	487	284	\$106	\$810	\$250	\$1,060	
27	First Floor	Classroom 119	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	688	2,290	1,576	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	1,990	1,154	1,003	23	184	300	421	151	\$78	\$432	\$250	\$682	
28	First Floor	Nursing Lab Storage 115	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	688	1,400	963	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	1,100	706	554	23	184	300	258	151	\$56	\$432	\$250	\$682	
29	First Floor	Women Restroom 146	1x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	10	62	620	2,610	1,618	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	10	42	300	Ceiling	1	420	2,310	1,096	970	20	200	300	522	126	\$89	\$500	\$250	\$750	
30	First Floor	Women Restroom 146	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	258	2,610	673	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	63	0		0	189	2,610	493	493	23	69	0	180	0	\$25	\$162	\$0	\$162	
31	First Floor	Men Restroom 144	2x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,610	449	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Ceiling	1	126	2,310	329	291	23	46	300	120	38	\$22	\$108</			



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL				CUSTOMER: FACILITY:				Cumberland County College Navone Healthcare Center				FACILITY SQ. FT. 16,165				DATE OF AUDIT: 7/10/2013											
				REPLACEMENT FIXTURES												ENERGY ANALYSIS					COST ANALYSIS						
PRE FIXTURE DESCRIPTION				PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.137	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast				2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188
2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast				2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$228
2x4' Recessed Direct/Indirect Fixture, w/ (2) F40TTL/40w 4-pin CFL & (1) Electronic Ballast				32	80	2,560	4,860	12,442	None	32	80	0		0	2,560	4,860	12,442	12,442	0	0	0	0	0	\$0	\$0	\$0	\$0
2x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast				16	62	992	4,860	4,821	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 2/32 Elec. Low-Power High Efficiency Ballast	16	42	0		0	672	4,860	3,266	3,266	20	320	0	1,555	0	\$213	\$800	\$0	\$640
Exterior Light 80W Metal Halide				4	65	260	4,368	1,136	30 Watt LED Wall Pack	4	18	0		0	72	4,368	314	314	47	188	0	821	0	\$112	\$800	\$0	\$720
75W Recessed incandescent canopy lighting				3	65	195	4,368	852	Relamp 18 Watt LED Lamp	3	18	0		0	54	4,368	236	236	47	141	0	616	0	\$84	\$300	\$0	\$240
				248		19,787		49,556		248				36	14,782		38,168	35,201				11,388	2,967	\$22,702	\$12,209	\$6,038	\$16,431



LIGHTING RETROFIT SUMMARY FOR:

Service Building
3322 College Dr. Vineland, NJ 08630

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL					
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTION	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Service Building	10,898	91	9,164	33,994	0.84	103	6,454	23,723	0.59	2,710	10,271	233	10,504	\$1,406	\$32	\$1,438	3.4	\$435	\$4,683	\$778	\$5,461	3.5

8%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
70%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
14%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
10%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL			CUSTOMER: FACILITY:		Cumberland County College Service Building					FACILITY SQ. FT. 10,898				DATE OF AUDIT: 7/10/2013										
			REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS					
PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.137	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
8' Fluorescent Strip with (2) F96T12 60W Lamps & (1) Magnetic Ballast, Pendant, No Lens	16	115	1,843	4,380	8,073	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	16	84	0		0	1,344	4,380	5,887	5,887	31	499	0	2,186	0	\$299	\$800	\$0	\$800
1'x4' Pendant strip, No Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	16	73	1,168	4,380	5,116	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	16	42	0		0	672	4,380	2,943	2,943	31	496	0	2,172	0	\$297	\$800	\$0	\$640
8' Fluorescent Strip with (2) F96T12 60W Lamps & (1) Magnetic Ballast, Pendant, No Lens	16	115	1,843	4,380	8,073	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	16	84	0		0	1,344	4,380	5,887	5,887	31	499	0	2,186	0	\$299	\$800	\$0	\$800
2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,600	896	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	300	Ceiling	1	252	2,300	655	580	23	93	300	241	76	\$43	\$216	\$250	\$391
2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,600	896	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	300	Ceiling	1	252	2,300	655	580	23	93	300	241	76	\$43	\$216	\$250	\$391
2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	4,380	1,133	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	63	0		0	189	4,380	828	828	23	70	0	305	0	\$42	\$162	\$0	\$132
8' Fluorescent Strip with (2) F96T12 60W Lamps & (1) Magnetic Ballast, Pendant, No Lens	6	115	691	4,380	3,027	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	6	84	0		0	504	4,380	2,208	2,208	31	187	0	820	0	\$112	\$300	\$0	\$300
8' Fluorescent Strip with (2) F96T12 60W Lamps & (1) Magnetic Ballast, Pendant, No Lens	19	115	2,189	2,340	5,122	Relamp & Reballast w/ (4) F28T8 Lamps & (1) 4/32 Elec. Low-Power High Efficiency Ballast	19	84	0		0	1,596	2,340	3,735	3,735	31	593	0	1,387	0	\$190	\$950	\$0	\$950
1'x4' Recessed Troffer, Prismatic Lens, w/ (1) F34T12/34w Lamp & (1) Energy Saving Magnetic Ballast	3	44	132	4,380	578	Relamp & Reballast w/ (1) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	25	0		0	75	4,380	329	329	19	57	0	250	0	\$34	\$150	\$0	\$120
2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,600	672	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	63	300	Ceiling	1	189	2,300	491	435	23	70	300	181	57	\$33	\$162	\$250	\$347
Wall pack 70W HPS	1	91	91	4,368	397	20 Watt LED Wall Pack	1	20	0		0	20	4,368	87	87	71	71	0	310	0	\$42	\$100	\$0	\$100
	91		9,164		33,994		103				19	6,454		23,723	23,517				10,305	233	\$1,462	\$4,683	\$778	\$5,000



LIGHTING RETROFIT SUMMARY FOR: **Student Center** **3322 College Dr. Vineland, NJ 08630**

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL					
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTION	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
Student Center	29,326	499	33,422	89,186	1.14	499	24,754	67,941	0.84	8,668	21,245	2,909	24,154	\$2,909	\$398	\$3,308	7.0	\$4,045	\$21,802	\$6,608	\$28,410	7.4

14%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
76%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
14%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
10%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL				CUSTOMER: FACILITY: Cumberland County College Student Center				FACILITY SQ. FT. 29,326				DATE OF AUDIT: 7/10/2013			
--	--	--	--	--	--	--	--	----------------------------	--	--	--	-----------------------------	--	--	--

SPACE DESCRIPTION										REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.137	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES	
1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
1	First Floor	Director Office 101	2x4 Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	356	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	95	38	\$18	\$108	\$120	\$188	
2	First Floor	Exec. Dir. 102	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,070	714	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	300	Ceiling	1	252	1,770	522	446	23	93	300	192	76	\$37	\$216	\$250	\$391	
3	First Floor	Office 103	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,070	714	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	300	Ceiling	1	252	1,770	522	446	23	93	300	192	76	\$37	\$216	\$250	\$391	
4	First Floor	Office 104	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
5	First Floor	Office 105	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
6	First Floor	Office 107	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
7	First Floor	Office 108	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
8	First Floor	Office 109	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
9	First Floor	Office 110	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
10	First Floor	Office 111	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
11	First Floor	Office 112	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
12	First Floor	Office 113	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
13	First Floor	Office 114	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
14	First Floor	Office 115	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
15	First Floor	Office 116	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
16	First Floor	Office 117	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
17	First Floor	Office 118	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
18	First Floor	Office 119	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
19	First Floor	Office 131	2x4 Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$18	\$108	\$120	\$188	
20	First Floor	Enrollment 130	1x4 Pendant Direct/Indirect Fixture with w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	46	62	2,852	2,070	5,904	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	46	42	0	0	1,932	2,070	3,999	3,999	20	920	0	1,904	0	\$261	\$2,484	\$0	\$2,484		
21	First Floor	Bursar 128	1x4 Pendant Direct/Indirect Fixture with w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	17	62	1,054	2,070	2,182	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	17	42	300	Wall	1	714	1,770	1,478	1,264	20	340	300	704	214	\$126	\$918	\$120	\$1,018	
22	First Floor	Server 127	2x4 Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	62	62	4,380	272	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	1	42	0	0	0	42	4,380	184	184	20	20	0	88	0	\$12	\$50	\$0	\$40	
23	First Floor	Student Support 126	1x4 Pendant Direct/Indirect Fixture with w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	62	744	2,070	1,540	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	12	42	300	Wall	1	504	1,770	1,043	892	20	240	300	497	151	\$89	\$648	\$120	\$748	
24	First Floor	Financial Aid 124	2x4 Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	688	2,070	1,424	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	1,770	1,043	892	23	184	300	381	151	\$73	\$432	\$250	\$567	
25	First Floor	Men Toilet	2x4 Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,610	324	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	2,310	219	194	20	40	300	104	25	\$18	\$100	\$120	\$180	
26	First Floor	Men Toilet	4 Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, No Lens	4	62	248	2,610	647	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	42	0	0	168	2,610	438	438	20	80	0	209	0	\$29	\$200	\$0	\$200		
27	First Floor	Women Toilet	2x4 Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,610	324	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	2,310	219	194	20	40	300	104	25	\$18	\$100	\$120	\$180	
28	First Floor	Women Toilet	4 Fluorescent Recessed Strip with (2) F32T8 700 Lamps & (1) Electronic Ballast, No Lens	4	62	248	2,610	647	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	42	0	0	168	2,610	438	438	20	80	0	209	0	\$29	\$200	\$0	\$200		
29	First Floor	Entrance	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	4	52	208	4,680	973	None	4	52	0	0	208	4,680	973	973	0	0	0	0	0	0	\$0	\$0	\$0	-\$80	
30	First Floor	Vestibule	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	3	52	156	4,680	730	None	3	52	0	0	156	4,680	730	730	0	0	0	0	0	0	\$0	\$0	\$0	-\$60	
31	First Floor	Corridor	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	69	52	3,588	4,680	16,792	None	69	52	0	0	3,588	4,680	16,792	16,792	0	0	0	0	0	0	\$0	\$0	\$0	-\$1,380	
32	First Floor	Corridor	2x4 Recessed Troffer, Prismatic Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	25	62	1,550	4,680	7,254	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	25	42	0	0	1,050	4,680	4,914	4,914	20	500	0	2,340							



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL				CUSTOMER: FACILITY:				Cumberland County College Student Center				FACILITY SQ. FT. 29,326				DATE OF AUDIT: 7/10/2013																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
PRE FIXTURE DESCRIPTION				PRE FIXT. QTY PRE WATTS / FIXT. PRE TOTAL WATTS / LINE DEFAULT ANNUAL HOURS PRE ANNUAL KWH				REPLACEMENT FIXTURES										ENERGY ANALYSIS						COST ANALYSIS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
								PROPOSED FIXTURE DESCRIPTION				POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
				910										910																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													



LIGHTING RETROFIT SUMMARY FOR:

University Center

3322 College Dr. Vineland, NJ 08630

BUILDING INFORMATION		EXISTING FIXTURES				PROPOSED FIXTURES				SAVINGS							FINANCIAL					
BUILDING	SQ. FT.	PRE TOTAL FIXT. QTY	PRE TOTAL FIXT. WATTS	PRE ANNUAL KWH CONSUMPTION	PRE WATTS / SQ. FT	POST TOTAL FIXT. QTY	POST TOTAL FIXT. WATTS	POST ANNUAL KWH CONSUMPTION	POST WATTS / SQ. FT	WATTS SAVED	ANNUAL KWH SAVED WITH FIXTURES	ANNUAL KWH SAVED WITH SENSORS	TOTAL ANNUAL KWH SAVED	ANNUAL SAVINGS \$ FIXT.	ANNUAL SAVINGS \$ SENSORS	ANNUAL SAVINGS \$ TOTAL	CO2 REDUCTION (TONS)	NJ Smart Start REBATE \$	FIXTURES TOTAL (INSTALLED) COST \$	SENSORS TOTAL (INSTALLED) COST \$	MATERIAL TOTAL (INSTALLED) COST \$	SIMPLE PAYBACK AFTER REBATE (YEARS)
University Center	17,498	268	19,272	50,337	1.10	268	14,958	40,716	0.85	4,314	9,621	2,733	12,354	\$1,191	\$338	\$1,529	3.2	\$2,970	\$12,062	\$7,320	\$19,382	10.7

15%	PERCENTAGE OF REBATES IN TOTAL INSTALLED COST
81%	PERCENTAGE OF CONSUMPTION COMPARE TO EXISTING STATE
13%	EXISTING PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING
11%	PROPOSED PERCENTAGE OF LIGHTING ENERGY CONSUMPTION OF THE WHOLE BUILDING



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL		CUSTOMER: FACILITY:		Cumberland County College University Center		FACILITY SQ. FT. 17,498		DATE OF AUDIT: 7/11/2013	
--	--	------------------------	--	--	--	----------------------------	--	-----------------------------	--

SPACE DESCRIPTION									REPLACEMENT FIXTURES											ENERGY ANALYSIS						COST ANALYSIS		
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS)	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST (MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES	
							910																	\$0.124				
1	First Floor	Office 105	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,070	714	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	63	300	Ceiling	1	252	1,770	522	446	23	93	300	192	76	\$33	\$216	\$250	\$391	
2	First Floor	Office 106	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188	
3	First Floor	Office 107	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188	
4	First Floor	Office 108	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	86	259	2,070	535	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	63	300	Wall	1	189	1,770	391	335	23	70	300	144	57	\$25	\$162	\$120	\$232	
5	First Floor	Office 109	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188	
6	First Floor	Storage 110	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	360	31	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	1	63	300	Wall	1	63	60	23	4	23	23	300	8	19	\$3	\$54	\$120	\$144	
7	First Floor	Office 111	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188	
8	First Floor	Office 112	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188	
9	First Floor	Storage 115	2'x4' Recessed Troffer w/ Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	1	86	86	2,070	178	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	1	63	300	Wall	1	63	1,770	130	112	23	23	300	48	19	\$8	\$54	\$120	\$144	
10	First Floor	Office 116	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,070	357	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,770	261	223	23	46	300	96	38	\$17	\$108	\$120	\$188	
11	First Floor	Reception 104	2'x4' Recessed Direct/Indirect Fixture, w/ (2) F40TTL40w 4-pin CFL & (1) Electronic Ballast	4	52	208	2,070	431	None	4	52	300	Ceiling	1	208	1,770	431	368	0	0	300	0	62	\$8	\$0	\$250	\$215	
12	First Floor	Waiting 103	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	4	52	208	2,070	431	None	4	52	0	0	208	2,070	431	431	431	0	0	0	0	0	\$0	\$0	\$0	\$0	
13	First Floor	Waiting 103	2'x4' Recessed Direct/Indirect Fixture, w/ (2) F40TTL40w 4-pin CFL & (1) Electronic Ballast	13	52	676	2,070	1,399	None	13	52	0	0	676	2,070	1,399	1,399	1,399	0	0	0	0	0	\$0	\$0	\$0	\$0	
14	First Floor	Computer Room 114	1'x4' Pendant Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,290	284	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	0	0	84	2,290	192	192	192	20	40	0	92	0	\$11	\$100	\$0	\$80	
15	First Floor	Electrical Room 113	1'x4' Pendant Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	1,150	143	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	0	0	84	1,150	97	97	97	20	40	0	46	0	\$6	\$100	\$0	\$80	
16	First Floor	Mechanical Room 121	1'x4' Pendant Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	1,150	285	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	42	0	0	168	1,150	193	193	193	20	80	0	92	0	\$11	\$200	\$0	\$160	
17	First Floor	Study Room 102	1'x4' Pendant Direct/Indirect Fixture with w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,290	568	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	42	300	Ceiling	1	168	1,990	385	334	20	80	300	183	50	\$29	\$200	\$250	\$375	
18	First Floor	Vestibule	2'x4' Recessed Direct/Indirect Fixture, w/ (2) F40TTL40w 4-pin CFL & (1) Electronic Ballast	3	52	156	4,680	730	None	3	52	0	0	156	4,680	730	730	730	0	0	0	0	0	\$0	\$0	\$0	\$0	
19	First Floor	Classroom 119	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	690	2,290	1,579	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	1,990	1,154	1,003	23	186	300	425	151	\$71	\$432	\$250	\$567	
20	First Floor	Classroom 119	1'x4' Pendant strip, No Lens, w/ (2) F32T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,290	334	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Ceiling	1	84	1,990	192	167	31	62	300	142	25	\$21	\$100	\$250	\$315	
21	First Floor	Classroom 120	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	690	2,290	1,579	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	1,990	1,154	1,003	23	186	300	425	151	\$71	\$432	\$250	\$567	
22	First Floor	Classroom 120	1'x4' Pendant strip, No Lens, w/ (2) F32T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,290	334	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	300	Wall	1	84	1,990	192	167	31	62	300	142	25	\$21	\$100	\$120	\$200	
23	First Floor	Classroom 121	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	12	86	1,034	2,290	2,369	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	12	63	300	Ceiling	2	756	1,990	1,731	1,504	23	278	300	638	227	\$107	\$648	\$1,000	\$1,248	
24	First Floor	Classroom 121	1'x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	3	62	186	2,290	426	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	3	42	300	Ceiling	1	126	1,990	289	251	20	60	300	137	38	\$22	\$150	\$250	\$335	
25	First Floor	Men Restroom 124	2'x4' Recessed Troffer, Prismatic Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	62	248	2,610	647	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	4	42	300	Ceiling	1	168	2,310	438	388	20	80	300	209	50	\$32	\$200	\$250	\$375	
26	First Floor	Men Restroom 124	1'x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	2,610	971	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	42	0	0	252	2,610	658	658	658	20	120	0	313	0	\$39	\$300	\$0	\$240	
27	First Floor	Women Restroom 126	2'x4' Recessed Direct/Indirect Fixture, w/ (2) F40TTL40w 4-pin CFL & (1) Electronic Ballast	4	52	208	2,610	543	None	4	52	300	Ceiling	1	208	2,310	543	480	0	0	300	0	62	\$8	\$0	\$250	\$215	
28	First Floor	Women Restroom 126	1'x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	62	372	2,610	971	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	42	0	0	252	2,610	658	658	658	20	120	0	313	0	\$39	\$300	\$0	\$240	
29	First Floor	Storage 125	1'x4' Pendant Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	360	45	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	0	0	84	360	30	30	30	20	40	0	14	0	\$2	\$100	\$0	\$80	
30	First Floor	Classroom 127	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,290	1,184	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	300	Ceiling	1	378	1,990	866	752	23	139	300	319	113	\$53	\$324	\$250	\$479	
31	First Floor	Classroom 127	1'x4' Recessed Troffer, No Lens, w/ (2) F34T12/34w Lamps & (1) Energy Saving Magnetic Ballast	2	73	146	2,290	334	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	2	42	0	0	84	2,290	192	192	192	31	62	0	142	0	\$18	\$100	\$0	\$80	
32	First Floor	Classroom 128	2'x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,290	1,184	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3/32 Elec. Low-Power High Efficiency Ballast	6	63	300	Ceiling	1	378	1,990	866	752	23	139	300	319	113	\$53	\$324	\$250	\$479	
33	First Floor	Classroom 128	1'x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,290	284	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3/																			



LIGHTING UPGRADE PROJECT LINE x LINE DETAIL	CUSTOMER: FACILITY:		Cumberland County College University Center		FACILITY SQ. FT. 17,498		DATE OF AUDIT: 7/11/2013	

SPACE DESCRIPTION										REPLACEMENT FIXTURES								ENERGY ANALYSIS						COST ANALYSIS			
LINE	FLOOR	SPACE DESCRIPTION	PRE FIXTURE DESCRIPTION	PRE FIXT. QTY	PRE WATTS / FIXT.	PRE TOTAL WATTS / LINE	DEFAULT ANNUAL HOURS 910	PRE ANNUAL KWH	PROPOSED FIXTURE DESCRIPTION	POST FIXT. QTY	POST WATTS / FIXT.	ANNUAL HOURS SAVED	SENSOR TYPE	QTY SENSORS / LINE	POST TOTAL WATTS / LINE	ANNUAL HOURS 910	POST ANNUAL KWH	POST ANNUAL KWH WITH OCC SENSOR	WATTS SAVED / FIXT.	TOTAL WATTS SAVED / LINE	ANNUAL HOURS SAVED	ANNUAL KWH SAVED FROM FIXT.	ANNUAL KWH SAVED WITH OCC	TOTAL ANNUAL \$ SAVINGS / LINE (INCLUDING SENSORS) \$0.124	TOTAL FIXTURE COST (MATERIAL PLUS LABOR)	TOTAL SENSOR COST MATERIAL PLUS LABOR)	TOTAL INSTALLED COST AFTER INCENTIVES
44	First Floor	Classroom 135	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	6	86	517	2,290	1,184	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3'32' Elec. Low-Power High Efficiency Ballast	6	63	300	Ceiling	1	378	1,990	866	752	23	139	300	319	113	\$53	\$324	\$250	\$479
45	First Floor	Classroom 135	2x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,290	284	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3'32' Elec. Low-Power High Efficiency Ballast	2	42				84	2,290	192	192	20	40	0	92	0	\$11	\$100	\$0	\$80
46	First Floor	Classroom 136	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	8	86	690	2,290	1,579	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3'32' Elec. Low-Power High Efficiency Ballast	8	63	300	Ceiling	1	504	1,990	1,154	1,003	23	186	300	425	151	\$71	\$432	\$250	\$567
47	First Floor	Classroom 136	2x4' Recessed Fixture, No Lens, w/ (2) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	62	124	2,290	284	Relamp & Reballast w/ (2) F28T8 Lamps & (1) 3'32' Elec. Low-Power High Efficiency Ballast	2	42				84	2,290	192	192	20	40	0	92	0	\$11	\$100	\$0	\$80
48	First Floor	Classroom 137	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	2	86	172	2,290	395	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3'32' Elec. Low-Power High Efficiency Ballast	2	63	300	Wall	1	126	1,990	289	251	23	46	300	106	38	\$18	\$108	\$120	\$188
49	First Floor	Classroom 138	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	4	86	345	2,290	790	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3'32' Elec. Low-Power High Efficiency Ballast	4	63	300	Ceiling	1	252	1,990	577	501	23	93	300	213	76	\$36	\$216	\$250	\$391
50	First Floor	Classroom 139	2x4' Recessed Troffer, No Lens, w/ (3) F32T8/32w 700 Lamps & (1) Electronic Ballast	5	86	431	2,290	987	Relamp & Reballast w/ (3) F28T8 Lamps & (1) 3'32' Elec. Low-Power High Efficiency Ballast	5	63	300	Ceiling	1	315	1,990	721	627	23	116	300	266	95	\$45	\$270	\$250	\$435
51	First Floor	Vestibule 131	2x4' Recessed Direct/Indirect Fixture, w/ (2) F40TTL40w 4-pin CFL & (1) Electronic Ballast	1	52	52	4,680	243	None	1	52				52	4,680	243	243	0	0	0	0	0	\$0	\$0	\$0	\$0
52	First Floor	Atrium	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	17	52	884	4,680	4,137	None	17	52				884	4,680	4,137	4,137	0	0	0	0	0	\$0	\$0	\$0	\$0
53	First Floor	Atrium	Suspended direct/indirect fluorescent fixture	9	38	342	4,680	1,601	None	9	38				342	4,680	1,601	1,601	0	0	0	0	0	\$0	\$0	\$0	\$0
54	First Floor	Coridor	2x4' Recessed Direct/Indirect Fixture, w/ (2) F40TTL40w 4-pin CFL & (1) Electronic Ballast	15	74	1,110	4,680	5,195	None	15	74				1,110	4,680	5,195	5,195	0	0	0	0	0	\$0	\$0	\$0	\$0
55	First Floor	Exterior	Exterior Light 80W Metal Halide	11	52	572	4,368	2,498	30 Watt LED Wall Pack	11	52				572	4,368	2,498	2,498	0	0	0	0	0	\$0	\$2,200	\$0	\$2,200
				268		19,272		50,337		268				33	14,958		40,716	37,983				9,621	2,733	\$1,529	\$12,062	\$7,320	\$16,412



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #5:

CHILLER PLANT OPTIMIZATION

Description:	Fahrenheit-based cooling degree days for a base temperature of 65F
Source:	www.degreedays.net (using temperature data from www.wunderground.com)
Accuracy:	Estimates were made to account for missing data: the "% Estimated" column shows how much each figure was affected (0% is best, 100% is worst)
Station:	NEWARK INTERNATIONAL AIRPORT, NJ, US (74.17W,40.68N)
Station ID:	KEWR

Chilled Water Pumps								Condenser Water Pumps						
		Constant Volume		Variable Volume					Constant Volume		Variable Volume			
Month starting	CDD	CHW Speed	Power	Est Pump Spd	Pump Power	Days	Savings	CDD	CW Speed	Power	Est Pump Spd	Pump Power	Days	Savings
8/1/2012	388	100%	100%	85%	61%	30	39%	388	100%	100%	90%	73%	30	27%
9/1/2012	172	100%	100%	80%	51%	30	49%	172	100%	100%	85%	61%	30	39%
10/1/2012	29	100%	100%	75%	42%	15	58%	29	100%	100%	80%	51%	15	49%
11/1/2012	0	0	0	0%	0%	0	0%	0	0	0	0%	0%	0	0%
12/1/2012	0	0	0	0%	0%	0	0%	0	0	0	0%	0%	0	0%
1/1/2013	0	0	0	0%	0%	0	0%	0	0	0	0%	0%	0	0%
2/1/2013	0	0	0	0%	0%	0	0%	0	0	0	0%	0%	0	0%
3/1/2013	0	0	0	0%	0%	0	0%	0	0	0	0%	0%	0	0%
4/1/2013	18	100%	100%	75%	42%	15	58%	18	100%	100%	80%	51%	15	49%
5/1/2013	108	100%	100%	80%	51%	30	49%	108	100%	100%	85%	61%	30	39%
6/1/2013	264	100%	100%	85%	61%	30	39%	264	100%	100%	90%	73%	30	27%
7/1/2013	484	100%	100%	90%	73%	30	27%	484	100%	100%	95%	86%	30	14%
Average Annual Savings 53%								Average Annual Savings 44%						

Chiller Plant Optimization

Variable Chilled Water and Condenser Water Loop Energy Savings

BUILDING	EQUIPMENT	Flow, GPM	Head, ft	Nominal HP	Annual Hours	EXISTING ENERGY CONSUMPTION, kWh	VFD Energy Saving %	IMPROVED ENERGY CONSUMPTION, kWh	ENERGY SAVINGS, kWh	ENERGY SAVINGS, \$	Total Installed Cost	Incentives	Net Cost
Chilled Water Pumps	P-CW #1	630	70	11.1	2,184	22,423	53%	10,470	11,953	\$1,573	\$7,243	\$0	\$7,243
	P-CW #2	630	70	11.1	2,184	22,423	53%	10,470	11,953	\$1,573	\$7,243	\$0	\$7,243
	P-CW #3	630	70	11.1	2,184	22,423	53%	10,470	11,953	\$1,573	\$7,243	\$0	\$7,243
	P-CW #4	630	70	11.1	2,184	22,423	53%	10,470	11,953	\$1,573	\$7,243	\$0	\$7,243
	P-CW #5	630	70	11.1	2,184	22,423	53%	10,470	11,953	\$1,573	\$7,243	\$0	\$7,243
	P-CW #6	630	70	11.1	2,184	22,423	53%	10,470	11,953	\$1,573	\$7,243	\$0	\$7,243
Condenser Water Pumps	P-CT #1	900	63	14.3	2,184	28,829	44%	16,233	12,597	\$1,658	\$9,914	\$0	\$9,914
	P-CT #2	1125	60	17.1	2,184	34,321	44%	19,325	14,996	\$1,973	\$9,914	\$0	\$9,914
	P-CT #3	450	63	7.2	2,184	14,415	44%	8,116	6,298	\$829	\$9,914	\$0	\$9,914
	P-CT #4	900	63	14.3	2,184	28,829	44%	16,233	12,597	\$1,658	\$9,914	\$0	\$9,914
											\$83,116	\$0	\$83,116
PF =		0.90											
Motor Efcy =		0.90							118,204	\$15,556	Total		\$83,116

Annual Hours: 24 hrs/day during cooling season. 1 to 2 pumps run at all times.

Chiller Plant Optimization

Optimized Chiller Sequencing with Variable Flow Pumping and Condenser Water Reset

Existing Configuration											Proposed Configuration									ENERGY SAVINGS			
Ambient Temp (DB)	MCWB	Bin Hours	Total Clg Load	Entering CW Temp	Load CH #1,2,3	Load CH #4	Load CH #5	kW/Ton #1,2,3	kW/Ton #4	kW/Ton #5	Total Load	Entering CW Temp	Load CH #1,2,3	Load CH #4	Load CH #5	kW/Ton #1,2,3	kW/Ton #4	kW/Ton #5	Existing kW	Proposed kW	Savings kW	Savings kWh	
101 - 105	80	5	650	92		300	350		0.60	0.55	650	88		300	350		0.60	0.55	373	373	0	0	
96 - 100	78	72	609	90		281	328		0.55	0.50	609	86		281	328		0.55	0.50	319	319	0	0	
91 - 95	76	141	569	88		263	306		0.55	0.50	569	84		263	306		0.55	0.50	298	298	0	0	
91 - 95	65	69	528	85		244	284		0.50	0.45	528	73		244	284		0.50	0.45	250	250	0	0	
86 - 90	64	154	488	85		225	263		0.50	0.45	488	72		225	263		0.45	0.40	231	206	24	3,761	
86 - 90	58	131	447	83		206	241		0.50	0.45	447	66		206	241		0.40	0.35	211	167	45	5,860	
81 - 85	63	152	406	80	406			0.70			406	71	116		290	0.70		0.40	284	197	87	13,207	
81 - 85	55	198	366	80	366			0.65			366	65			366			0.32	238	117	121	23,890	
76 - 80	62	154	325	80	325			0.65			325	70			325			0.35	211	114	98	15,043	
76 - 80	55	257	284	80	284			0.60			284	70			284			0.35	171	100	71	18,281	
71 - 75	57	129	244	80	244			0.60			244	70			244			0.35	146	85	61	7,835	
71 - 75	48	309	203	80	203			0.60			203	70			203			0.35	122	71	51	15,670	
66 - 70	52	463	163	80	163			0.60			163	70	163			0.60			98	98	0	0	
61 - 65	50	460	122	80	122			0.60			122	70	122			0.60			73	73	0	0	
56 - 60	46	409	81	80	81			0.60			81	70	81			0.60			49	49	0	0	
51 - 55	42	345	0	80	0			0.60															
Energy Savings (kWh)																			103,547				

Total Savings = Chiller Energy Savings + Pumping Energy Savings

=103,547 kWh + 62,485 kWh

221,751 kWh



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #6:

ROOFTOP UNIT FUEL SWITCHING

Rooftop Unit Fuel Switch

Total Load Cool Load (Tons)		Exist SEER=	-	New SEER=	-
Est. Heating Capacity (MBH)	30	Exist AFUE=	-	New AFUE=	80%

(Before 5% estimated loss in the campus heating loop)

HEATING ENERGY SAVINGS ELECTRIC HEAT VS GAS FIRED HEAT														
Ambient Bin Deg F	Avg. Temp DB (deg F)	R.H. Relative Humidity (%)	01-08 (Hrs)	09-16 (Hrs)	17-24 (Hrs)	Total Bin Hours During Occupy Hours	MBH	Therms/Yr	kWh Hrs/Yr	Existing EER / AFUE	Proposed EER / AFUE	Existing Unit kWh	Proposed Unit Therms	Cost Savings
50-55	52.5	62.51%	218.0	223.0	289.0	730.00	3	24	713	1.00	75%	713	32.44	\$63.10
45-50	47.5	59.88%	243.0	196.0	195.0	634.00	7	42	1,239	1.00	75%	1,239	56.36	\$109.60
40-45	42.5	66.11%	193.0	171.0	149.0	513.00	10	51	1,504	1.00	75%	1,504	68.40	\$133.02
35-40	37.5	69.31%	357.0	311.0	355.0	1,023.00	13	136	3,998	1.00	75%	3,998	181.87	\$353.68
30-35	32.5	68.99%	277.0	221.0	236.0	734.00	17	122	3,585	1.00	75%	3,585	163.11	\$317.21
25-30	27.5		159.0	98.0	134.0	391.00	20	78	2,292	1.00	75%	2,292	104.27	\$202.77
20-25	22.5		89.0	48.0	58.0	195.00	23	46	1,334	1.00	75%	1,334	60.67	\$117.98
15-20	17.5		74.0	20.0	31.0	125.00	27	33	977	1.00	75%	977	44.44	\$86.43
10-15	12.5		35.0	7.0	5.0	47.00	30	14	413	1.00	75%	413	18.80	\$36.56
5-10	7.5		17.0	9.0	8.0	34.00	30	10	299	1.00	75%	299	13.60	\$26.45
0-5	2.5		1.0	0.0	0.0	1.00	30	0	9	1.00	75%	9	0.40	\$0.78
-5-0	-2.5		0.0	0.0	0.0	0.00	30	0	0	1.00	75%	0	0.00	\$0.00
4,427.00												16,362	744	\$1,448

Elec Rate (\$/kWh)	\$0.132	Gas Rate (\$/Therm)	\$0.948
--------------------	---------	---------------------	---------

Number of Units	2
Cooling Total Saving, Kwh	0
Heating Total Saving, kWh	32,724
Heating Total Saving, therms	-1,489
Total Savings, \$	\$2,895

kWh Therms



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #7:

DAYLIGHT HARVESTING

Daylight Harvesting

Building	Floor	Space Description	Fixture Description	Quantity	Watt/ Fixtures	Total Watts/Line	Annual Hours	Annual kWh	Daylight Saving Hours	Annual Hours after day lighting	Annual kWh with day lighting	Saving, kWh	Savings, \$	Cost	PayBack
University Center	First Flr	Attrium	Recessed round fixture w/ prismatic lens w/ (2) 26W Compact Fluorescent Lamp (CFL)	9	38	342	4,680	1,601	1,404	3,276	1,120	480	\$268	\$3,000	11.2
University Center	First Flr	Attrium	Suspended direct/indirect florescent fixture	15	74	1,110	4,680	5,195	1,404	3,276	3,636	1,558			
Conference Center	First Flr	Attrium	Recessed round fixture, w/ (2) 13W Compact Fluorescent Lamp (CFL), No Lense	20	26	520	4,680	2,434	1,404	3,276	1,704	730	\$323	\$4,000	12.4
Conference Center	First Flr	Attrium	Architectural Pandtant w/ Direct Indirect Fixture w/ (4) 26W Compact Fluorescent Lamp (CFL)	5	104	520	4,680	2,434	1,404	3,276	1,704	730			
Conference Center	First Flr	Attrium	Wall Sconce w/ acrylic lens w/ (2) 13W Compact Fluorescent Lamp (CFL)	5	26	130	4,680	608	1,404	3,276	426	183			
Conference Center	First Flr	Attrium	Recessed round fixture, No lens w/ (2) 32W Compact Fluorescent Lamp (CFL)	9	64	576	4,680	2,696	1,404	3,276	1,887	809			
Total									8,424	19,656	10,477	4,490	\$591	\$7,000	12
Electricity Rate	\$ 0.132														



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #8:

PREMIUM EFFICIENCY ELECTRIC MOTORS

Premium Efficiency Motors

Equipment	Motor HP	Hours of Operation	Existing Efficiency	Proposed NEMA Efficiency	Power Savings, kW	Energy Savings, kWh	Energy Cost Savings	Installed Cost	Incentives	Cost After Incentives	Payback After Rebate	Replace	Net Installed Cost	Power Savings, kW	Energy Cost Savings	Payback After Rebate
Academic Building - CHWP-1	5.0	2,190	85.5%	89.5%	0.18	386	\$51	\$1,723	\$60	\$1,663	33	N	\$0	0	\$0	0
Academic Building - CHWP-2	5.0	2,190	85.5%	89.5%	0.18	386	\$51	\$1,723	\$60	\$1,663	33	N	\$0	0	\$0	0
Admin Building - AHU-1 Supply	15.0	4,784	88.5%	92.4%	0.48	2,310	\$304	\$4,016	\$115	\$3,901	13	Y	\$4,016	2,310	\$304	12.8
Conference Center - AHU-1 Supply	7.5	4,784	91.0%	91.7%	0.04	203	\$27	\$2,181	\$90	\$2,091	78	N	\$0	\$0	\$0	0
Conference Center - AHU-4 Supply	7.5	4,784	91.0%	91.7%	0.04	203	\$27	\$2,181	\$90	\$2,091	78	N	\$0	\$0	\$0	0
Conference Center - CHWP-1	10.0	2,190	89.5%	91.7%	0.18	396	\$52	\$2,827	\$100	\$2,727	52	N	\$0	\$0	\$0	0
Conference Center - CHWP-2	10.0	2,190	89.5%	91.7%	0.18	396	\$52	\$2,827	\$100	\$2,727	52	N	\$0	\$0	\$0	0
Conference Center - HWP-1	7.5	2,190	89.5%	91.7%	0.13	297	\$39	\$2,181	\$90	\$2,091	53	N	\$0	\$0	\$0	0
Conference Center - HWP-2	7.5	2,190	89.5%	91.7%	0.13	297	\$39	\$2,181	\$90	\$2,091	53	N	\$0	\$0	\$0	0
Library - AHU-1 Supply	7.5	4,784	88.5%	91.7%	0.20	955	\$126	\$2,181	\$90	\$2,091	17	Y	\$2,181	955	\$126	16.6
Library - AHU-1 Return	5.0	4,784	87.5%	89.5%	0.09	412	\$54	\$1,723	\$60	\$1,663	31	N	\$0	\$0	\$0	0
Navone Building - HWP-1	5.0	2,190	87.5%	89.5%	0.09	189	\$25	\$1,723	\$60	\$1,663	67	N	\$0	\$0	\$0	0
Navone Building - HWP-2	5.0	2,190	87.5%	89.5%	0.09	189	\$25	\$1,723	\$60	\$1,663	67	N	\$0	\$0	\$0	0
Navone Building - CHWP-1	5.0	2,190	87.5%	89.5%	0.09	189	\$25	\$1,723	\$60	\$1,663	67	N	\$0	\$0	\$0	0
Navone Building - CHWP-2	5.0	2,190	87.5%	89.5%	0.09	189	\$25	\$1,723	\$60	\$1,663	67	N	\$0	\$0	\$0	0
Student Center - CHWP-1	15.0	2,190	88.5%	92.4%	0.48	1,058	\$139	\$4,016	\$115	\$3,901	28	N	\$0	\$0	\$0	0
Student Center - CHWP-2	15.0	2,190	88.5%	92.4%	0.48	1,058	\$139	\$4,016	\$115	\$3,901	28	N	\$0	\$0	\$0	0
Student Center - HWP-1	10.0	2,190	89.5%	91.7%	0.18	396	\$52	\$2,827	\$100	\$2,727	52	N	\$0	\$0	\$0	0
Student Center - HWP-2	10.0	2,190	89.5%	91.7%	0.18	396	\$52	\$2,827	\$100	\$2,727	52	N	\$0	\$0	\$0	0
Service Building - HWP	7.5	2,190	91.0%	91.7%	0.04	93	\$12	\$2,181	\$90	\$2,091	171	N	\$0	\$0	\$0	0
Service Building - HWP	7.5	2,190	91.0%	91.7%	0.04	93	\$12	\$2,181	\$90	\$2,091	171	N	\$0	\$0	\$0	0
Service Building - HWP	7.5	2,190	91.0%	91.7%	0.04	93	\$12	\$2,181	\$90	\$2,091	171	N	\$0	\$0	\$0	0
Service Building - HWP	7.5	2,190	91.0%	91.7%	0.04	93	\$12	\$2,181	\$90	\$2,091	171	N	\$0	\$0	\$0	0
Service Building - CHWP	7.5	2,190	91.0%	91.7%	0.04	93	\$12	\$2,181	\$90	\$2,091	171	N	\$0	\$0	\$0	0
Service Building - CHWP	7.5	2,190	91.0%	91.7%	0.04	93	\$12	\$2,181	\$90	\$2,091	171	N	\$0	\$0	\$0	0
Service Building - CHWP	15.0	2,190	91.7%	92.4%	0.08	183	\$24	\$4,016	\$115	\$3,901	162	N	\$0	\$0	\$0	0
Total	67.5												\$6,197	3,265	\$430	13.9

This measure is not recommended for implementation at this time due to its long payback.



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #9:

VARIABLE FREQUENCY DRIVES & 2-WAY VALVE INSTALLATION

Variable Frequency Drives and 2-Way Valves

BUILDING	EQUIPMENT	NOMINAL POWER, HP	Existing Efficiency	Proposed NEMA Prm Efficiency	HOURS of OPERATION	EXISTING ENERGY CONSUMPTION, kWh	VFD Energy Saving %	IMPROVED ENERGY CONSUMPTION, kWh	ENERGY SAVINGS, kWh	ENERGY SAVINGS, \$	Demand Savings	Total Installed Cost	Incentives	Net Cost	Estimated Payback Period
Academic Building	CHWP	5.0	85.5%	89.5%	2190	8,492	57%	3,468	5,024	\$661	0.2	\$7,746	\$54	\$7,692	11.6
Academic Building	CHWP	5.0	85.5%	89.5%	2190	8,492	57%	3,468	5,024	\$661	0.2	\$7,746	\$54	\$7,692	11.6
Conference Center	CHWP	10.0	89.5%	91.7%	2190	16,226	57%	6,770	9,456	\$1,244	0.2	\$18,542	\$90	\$18,452	14.8
Conference Center	CHWP	10.0	89.5%	91.7%	2190	16,226	57%	6,770	9,456	\$1,244	0.2	\$18,542	\$90	\$18,452	14.8
Conference Center	HWP	7.5	88.5%	91.7%	2190	12,307	40%	7,131	5,176	\$681	0.2	\$12,554	\$81	\$12,473	18.3
Conference Center	HWP	7.5	88.5%	91.7%	2190	12,307	40%	7,131	5,176	\$681	0.2	\$12,554	\$81	\$12,473	18.3
Library	CHWP	5.0	89.5%	89.5%	2190	8,113	57%	3,468	4,645	\$611	0.0	\$6,804	\$0	\$6,804	11.1
Library	CHWP	5.0	89.5%	89.5%	2190	8,113	57%	3,468	4,645	\$611	0.0	\$6,804	\$0	\$6,804	11.1
Navone Building	CHWP	5.0	87.5%	89.5%	2190	8,298	57%	3,468	4,830	\$636	0.1	\$11,158	\$54	\$11,104	17.5
Navone Building	CHWP	5.0	87.5%	89.5%	2190	8,298	57%	3,468	4,830	\$636	0.1	\$11,158	\$54	\$11,104	17.5
Navone Building	HWP	5.0	87.5%	89.5%	2190	8,298	40%	4,871	3,427	\$451	0.1	\$11,158	\$54	\$11,104	24.6
Navone Building	HWP	5.0	87.5%	89.5%	2190	8,298	40%	4,871	3,427	\$451	0.1	\$11,158	\$54	\$11,104	24.6
Student Center	CHWP	15.0	88.5%	92.4%	2190	24,614	57%	10,078	14,536	\$1,913	0.4	\$22,863	\$104	\$22,759	11.9
Student Center	CHWP	15.0	88.5%	92.4%	2190	24,614	57%	10,078	14,536	\$1,913	0.4	\$22,863	\$104	\$22,759	11.9
Student Center	HWP	10.0	89.5%	91.7%	2190	16,226	40%	9,508	6,718	\$884	0.2	\$18,542	\$90	\$18,452	20.9
Student Center	HWP	10.0	89.5%	91.7%	2190	16,226	40%	9,508	6,718	\$884	0.2	\$18,542	\$90	\$18,452	20.9
University Center	CHWP	5.0	89.5%	89.5%	2190	8,113	57%	3,468	4,645	\$611	0.0	\$6,591	\$54	\$6,537	10.7
University Center	CHWP	5.0	89.5%	89.5%	2190	8,113	57%	3,468	4,645	\$611	0.0	\$6,591	\$54	\$6,537	10.7
Total									116,911	15,386	2	231,916	1,162	230,754	15.0

Cost of Electricity	0.132	/kWh
Load Factor	80%	
Power Factor	90%	

Variable Frequency Drives and 2-Way Valves

Description:	Fahrenheit-based heating degree days for a base temperature of 65F
Source:	www.degreedays.net (using temperature data from www.wunderground.com)
Accuracy:	Estimates were made to account for missing data: the "% Estimated" column shows how much each figure was affected (0% is best, 100% is worst)
Station:	NEWARK INTERNATIONAL AIRPORT, NJ, US (74.17W,40.68N)
Station ID:	KEWR

Heating Degree Days								Cooling Degree Days							
		Constant Volume		Variable Volume					Constant Volume		Variable Volume (Ave.)				
Month starting	HDD	HW Speed	Power	Est Pump Spd	Pump Power	Days	Savings	CDD	CW Speed	Power	Est Pump Spd	Pump Power	Days	Savings	
8/1/2012	1	0	0	0	0	0	0	388	100%	100%	90%	73%	30	27%	
9/1/2012	40	0	0	0%	0%	0	0	172	100%	100%	80%	51%	30	49%	
10/1/2012	219	100%	100%	65%	27%	15	73%	29	100%	100%	70%	34%	15	66%	
11/1/2012	656	100%	100%	72%	37%	30	63%	0	0	0	0%	0%	0	0%	
12/1/2012	732	100%	100%	80%	51%	30	49%	0	0	0	0%	0%	0	0%	
1/1/2013	914	100%	100%	100%	100%	30	0%	0	0	0	0%	0%	0	0%	
2/1/2013	863	100%	100%	94%	84%	30	16%	0	0	0	0%	0%	0	0%	
3/1/2013	772	100%	100%	84%	60%	30	40%	0	0	0	0%	0%	0	0%	
4/1/2013	380	100%	100%	65%	27%	15	73%	18	100%	100%	70%	34%	15	66%	
5/1/2013	162	0%		0%	0%	0	0	108	100%	100%	80%	51%	30	49%	
6/1/2013	19	0%		0%	0%	0	0	264	100%	100%	90%	73%	30	27%	
7/1/2013	0	0%		0%	0%	0	0	484	100%	100%	100%	100%	30	0%	
Average Annual Savings							40%	Average Annual Savings							57%



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #10:

DEMAND CONTROLLED KITCHEN VENTILATION



INTELLI-HOOD VARIABLE EXHAUST CONTROLLER

ENERGY SAVINGS REPORT

CUSTOMER: Cumberland CC

COMPANY: 0

RETROFIT

ADDRESS: 3322 College Dr

Vineland, NJ 08360

Aug-27-13

APPLICATION: Student Center I

- MOTOR OPERATING SAVINGS: \$872 /YEAR

- HEATING SAVINGS: \$624 /YEAR

- COOLING SAVINGS: \$396 /YEAR

- TOTAL SAVINGS: \$1,893 /YEAR

- INSTALLED COST: \$33,500

- PAYBACK PERIOD: 17.7 YEARS

- RATE OF RETURN - 5 YEARS: N/A

10 YEARS: -6.9 %

The projected savings shown above are based on the above store's operating hours, HVAC system, cooking load, and geographic location.

I. MOTOR OPERATING SAVINGS

INPUT DATA:

A Operating Hours Per Day	8.8	HRS/DAY
B Operating Days Per Week	5	DAYS/WK
C Operating Weeks Per Year	50	WKS/YR
D Horsepower of Fan Motor(s)	6	HP
E Load Factor of Fan Motor(s)	0.9	
F Cost Per Kilowatt Hour	0.1316	\$/KWHR

CONSTANT EXHAUST VOLUME ANALYSIS:

G Total Time (A x B x C)	2200	HRS/YR
H Total KWHR/HP/YR (0.746/0.9 x G)	1823.6	KWHR/HP/YR

VARIABLE EXHAUST VOLUME ANALYSIS:

% Rated RPM H	% Run Time I	Time HRS/YR J=FxI	Output KW/HP K	System Effic. L	Input KW/HP M=K/L	KWHR/ HP/YR N=JxM
100	5	110	0.746	0.9	0.829	91.2
90	10	220	0.544	0.9	0.604	133.0
80	15	330	0.382	0.9	0.424	140.1
70	15	330	0.256	0.9	0.284	93.9
60	25	550	0.161	0.9	0.179	98.4
50	10	220	0.093	0.9	0.103	22.7
40	10	220	0.048	0.9	0.053	11.7
30	10	220	0.020	0.9	0.022	4.9
20	0	0	0.015	0.9	0.017	0.0
10	0	0	0.010	0.90	0.011	0.0
O Total KWH/HP/YR (Total of Column N)						595.8

CALCULATION:

$$\text{SAVINGS} = (H - O) \times D \times E \times F = \text{\$872 /YEAR}$$

=====

II. CONDITIONED MAKE-UP AIR - HEATING

INPUT DATA:

A Previous Net Exhaust Volume	4500	CFM
B New Net Exhaust Volume (1)	2858	CFM
C Winter Building Temperature	70	F
D Previous Net Heat Load (2)	225479	kBTU
E New Net Heat Load (2)	143179	kBTU
F Operating Hours Per Day	8.80	HRS/DAY
G Operating Days Per Week	5	DAYS/WK
- Heating Fuel Type	Gas	
H Cost Per Fuel Unit (3)	0.948	\$/UNIT
J BTU Per Fuel Unit (4)	100	kBTU/UNIT
K System Efficiency (4)	75%	

CALCULATION:

$$\text{SAVINGS} = (D - E) \times 0.6 \times H / (J \times K)$$

$$= \$624 \text{ /YEAR}$$

=====

NOTES:

(1) Determine the New Exhaust Volume by completing TABLE 1. The New Exhaust Volume equals the AVG % RPM x the Previous Exhaust Volume.

(2) Using design weather data via the Outdoor Airload Calculator and multiplied by days/year ratio.

(3) Using local energy costs.

(4) Using typical system efficiency.

TABLE 1		
% Rated RPM (F)	% Run Time (I)	F x I
100	5	5
90	10	9
80	15	12
70	15	11
60	25	15
50	10	5
40	10	4
30	10	3
20	0	0
10	0	0
AVG % RPM =		64%

III. CONDITIONED MAKE-UP AIR SAVINGS - COOLING

INPUT DATA:

A Previous Net Exhaust Volume	4500 CFM
B New Net Exhaust Volume (1)	2858 CFM
C Previous Net Cooling Load (2)	123781 kBTU
D New Net Cooling Load (2)	78601 kBTU
E AC Correction Factor (3)	1
F Cost Per Fuel Unit (5)	0.1316 \$/kWH
G COP (6)	2.6

CALCULATION:

SAVINGS = $(C - D) \times 0.6 \times E \times F / (3.413 \times G)$

= \$396 /YEAR
=====

NOTES:

(1) Using New Exhaust Volume from CONDITIONED MAKE-UP AIR SAVINGS - HEATING on page 2. See Note 1.

(2) Obtained from Outdoor Airload Calculator

(3) Using design weather data.

(4) The multiplier corrects for actual % outside air.

(5) Using local energy costs.

(6) Using typical system efficiency.

AFTER-TAX CASH FLOW ANALYSIS

INPUT DATA:

FIRST YEAR SAVINGS	\$1,893 /YEAR
INITIAL COST PLUS INSTALLATION	\$33,500
MARGINAL TAX RATE	0%
ESTIMATED ANNUAL INCREASE IN ENERGY COSTS	3%

<u>YEAR</u>	<u>SAVINGS</u>	<u>COST</u>	DEPREC. %	DEPREC. \$	NET AFTER-TAX CASH FLOW
0		-33,500			-33,500
1	1893	-	29	9715	1893
2	1950	-	20	6700	1950
3	2008	-	13	4355	2008
4	2069	-	10	3350	2069
5	2131	-	9	3015	2131
6	2195	-	9	3015	2195
7	2260	-	9	3015	2260
8	2328	-			2328
9	2398	-			2398
10	2470	-			2470

CALCULATIONS:

NET PRESENT VALUE : -\$23,319 ; INTERNAL RATE
5 YEARS @ 15% OF RETURN (IRR) = -29.8 %

NET PRESENT VALUE : -\$19,970 ; INTERNAL RATE
10 YEARS @ 15% OF RETURN (IRR) = -6.9 %

NOTE:

Net After-tax Cash Flow is calculated as follows:

$$\text{NATCF} = \text{SAVINGS} - \text{COSTS} - \text{TAX RATE}(\text{SAVINGS} - \text{COSTS} - \text{DEPRECIATION})$$

Net Present Value is calculated as follows:

$$\text{NPV} = C(0) + C(1)/(1 + r) + C(2)/(1 + r)^2 + \dots + C(n)/(1 + r)^n$$

(where C(n) is the net cash flow for the nth year
and r is the opportunity cost of capital)

IRR is calculated by trial and error using the formula:

$$\text{NPV} = C(0) + C(1)/(1 + \text{IRR}) + C(2)/(1 + \text{IRR})^2 + \dots + C(n)/(1 + \text{IRR})^n$$



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #11:

BOILER REPLACEMENT

Boiler Replacement

Month	Natural Gas Therms	Total Cost	\$/Therm	Est. Existing Boiler Efcy	Proposed Boiler Efcy	Proposed Natural Gas Therms	Energy Savings, Therms
Jun-12	12,789	\$12,373	\$0.97	75%	90%	10,658	2,132
Jul-12	13,138	\$12,786	\$0.97	75%	90%	10,948	2,190
Aug-12	14,462	\$13,873	\$0.96	75%	90%	12,052	2,410
Sep-12	20,186	\$19,169	\$0.95	80%	90%	17,943	2,243
Oct-12	20,948	\$19,883	\$0.95	80%	88%	19,044	1,904
Nov-12	34,270	\$32,202	\$0.94	80%	86%	31,879	2,391
Dec-12	22,683	\$21,625	\$0.95	80%	84%	21,603	1,080
Jan-13	34,209	\$31,882	\$0.93	80%	82%	33,374	834
Feb-13	28,506	\$26,734	\$0.94	80%	84%	27,149	1,357
Mar-13	31,948	\$29,802	\$0.93	80%	86%	29,719	2,229
Apr-13	14,303	\$13,881	\$0.97	75%	90%	11,919	2,384
May-13	18,371	\$17,753	\$0.97	75%	92%	14,976	3,395
	265,814	\$251,964	\$0.95			241,265	24,549

Existing Conditions and Assumptions

- 1 - Smaller (80 HP, HB Smith) boilers fired during off season for reheat
- 2 - 80 HP HB Smith boilers' estimated efficiency = 75%
- 3 - Larger (150 HP, Hurst) boilers fire during heating season
- 4 - 150 HP Hurst boilers' estimated efficiency = 80%
- 5 - Hot water supply temperature kept high year round for cast iron boilers' safety

Boiler Replacement - Design Basis

Boiler	Capacity, HP	Capacity, MBH	Action	Basis
#1	70 HP	2,330	Replace	Aerco BMK 3.0 or similar
#2	80 HP	2,717	Replace	Aerco BMK 3.0 or similar
#3	80 HP	2,717	Replace	Aerco BMK 3.0 or similar
#4	150 HP	5,022	Keep	-
#5	150 HP	5,022	Keep	-

Total Cost	Material	\$240,000
	Labor	\$210,000
	Total	\$450,000

Proposed Sequence of Operation

- 1 - Run high efficiency condensing boilers at all times
- 2 - Run 150 HP boilers only during high heating demand in winter
- 3 - Hot water supply temperature during off season should be set as low as possible (130-140°F)



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #12:

HEAT RECOVERY CHILLER INSTALLATION

Heat Recovery Chiller Installation

Heat Recovery Chiller (Chiller Heater) Installation - Energy Savings

Existing Configuration											
Ambient Temp (DB)	MCWB	Bin Hours	Total Clg Load	Entering CW Temp	Load CH #1,2,3	Load CH #4	Load CH #5	kW/Ton #1,2,3	kW/Ton #4	kW/Ton #5	Cond. Pump, kW
101 - 105	80	5	650	92		300	350		0.60	0.55	30
96 - 100	78	72	609	90		281	328		0.55	0.50	30
91 - 95	76	141	569	88		263	306		0.55	0.50	30
91 - 95	65	69	528	85		244	284		0.50	0.45	30
86 - 90	64	154	488	85		225	263		0.50	0.45	30
86 - 90	58	131	447	83		206	241		0.50	0.45	30
81 - 85	63	152	406	80	406			0.70			15
81 - 85	55	198	366	80	366			0.65			15
76 - 80	62	154	325	80	325			0.65			15
76 - 80	55	257	284	80	284			0.60			15
71 - 75	57	129	244	80	244			0.60			15
71 - 75	48	309	203	80	203			0.60			15
66 - 70	52	463	163	80	163			0.60			15
61 - 65	50	460	122	80	122			0.60			15
56 - 60	46	409	81	80	81			0.60			15
51 - 55	42	345	0	80	0			0.60			

Month	Natural Gas Therms	Total Cost	\$/Therm	Est. Existing Boiler Efcy	Summer Gas Cons. Therms
Jun-12	12,789	\$12,373	\$0.97	75%	12,789
Jul-12	13,138	\$12,786	\$0.97	75%	13,138
Aug-12	14,462	\$13,873	\$0.96	75%	14,462
Sep-12	20,186	\$19,169	\$0.95	80%	20,186
Oct-12	20,948	\$19,883	\$0.95	80%	
Nov-12	34,270	\$32,202	\$0.94	80%	
Dec-12	22,683	\$21,625	\$0.95	80%	
Jan-13	34,209	\$31,882	\$0.93	80%	
Feb-13	28,506	\$26,734	\$0.94	80%	
Mar-13	31,948	\$29,802	\$0.93	80%	
Apr-13	14,303	\$13,881	\$0.97	75%	
May-13	18,371	\$17,753	\$0.97	75%	
	265,814	\$251,964	\$0.95		60,576

Heat Recovery Chiller Installation

Heat Recovery Chiller (Chiller Heater) Installation - Energy Savings

Proposed Configuration												ENERGY SAVINGS						
Total Load	Entering CW Temp	Load CH #1,2,3	Load CH #4	Load CH #5	Load Chiller Heater	kW/Ton #1,2,3	kW/Ton #4	kW/Ton #5	kW/Ton Chiller Heater	Heat Reclaim MBH	Cond. Pump, kW	Existing kW	Proposed kW	Savings kW	Savings kWh	Savings Therms	Energy Savings \$	Demand Savings \$
650	88	300		350		0.80	0.60	0.55	1.16	0	30	402	462	-60	-309	0	-\$41	\$0
609	86	281		328		0.75	0.55	0.50	1.16	0	30	349	405	-56	-4,050	0	-\$533	\$0
569	84	263		306		0.70	0.55	0.50	1.16	0	30	327	367	-39	-5,569	0	-\$733	\$0
528	73	178		350		0.70	0.50	0.45	1.16	0	21	280	303	-23	-1,624	0	-\$214	\$0
488	72	150		338		0.70	0.50	0.45	1.16	0	21	260	278	-17	-2,669	0	-\$351	\$0
447	66	-10		297	160	0.70	0.50	0.45	1.16	2499	21	241	333	-92	-12,039	3,277	\$1,522	(\$574)
406	71	246			160	0.70			1.16	2499	10	299	368	-69	-10,487	3,791	\$2,213	(\$432)
366	65	206			160	0.65			1.16	2499	10	253	330	-77	-15,271	4,947	\$2,680	(\$482)
325	70	165			160	0.65			1.17	2499	10	226	305	-79	-12,146	3,855	\$2,056	(\$492)
284	70	124			160	0.60			1.16	2499	10	186	271	-85	-21,889	6,425	\$3,210	(\$532)
244	70	94			150	0.60			1.17	2342	10	161	242	-81	-10,417	3,012	\$1,484	(\$506)
203	70	83			120	0.60			1.50	1874	10	137	240	-104	-31,945	5,782	\$1,277	(\$647)
163	70	43			120	0.60			1.3	1874	10	112	192	-80	-36,808	8,674	\$3,378	(\$497)
122	70	122				0.60					15	88	88	0	0	0	\$0	\$0
81	70	81				0.60					15	64	64	0	0	0	\$0	\$0
		0				0.60											\$0	\$0
												Total Energy Savings (kWh)			-165,223	39,762	\$15,947	(\$4,162)

\$11,785

Chiller Heater Load	Power input kW*	Cooling Tons	Heating Tons	Cooling kW/Ton	Heating MBH/Ton	Heating MBH**
100%	277.8	238.6	310.5	1.16	15.6	3726
75%	208.7	179	233	1.17	15.6	2796
50%	150.7	116	155	1.30	16.0	1860
30%	124.5	61	93	2.04	18.3	1116

* Data based on 300-Ton Carrier Heat Reclaim chiller (30XW300)

** 130F supply / 115F return (For Hot Water Reheat)

30% Condenser water pumping savings based on reduction in cooling tower water flow



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #13:

HVAC UNIT UPGRADES

AC Unit Upgrades - Summary

RTU Replacment	Cooling Capacity, Tons	Number of Units	Cooling Electricity Savings (kWh/yr)	Heating Electricity Savings (kWh/yr)	Heating Gas Savings (therms/year)	Total Savings \$	Estimated Initial Implementation Cost	Incentives	Cost After Incentives	Estimated Payback Period
Service Building	4	2	1,867	35,086	-2,233	\$2,746	\$27,744	\$368	\$27,376	10
Academic Building	7.5	4	15,038	0	0	\$1,979	\$65,680	\$548	\$65,133	33

AHU Replacment	Ton	Number of Units	Electricity Savings (kWh/yr)	Heating Electricity Savings (kWh/yr)	Gas Savings (Therms/yr)	Total Savings \$	Estimated Initial Implementation Cost	Incentives	Cost After Incentives	Estimated Payback Period
Admin Building	41	1	4,117	0	1,241	\$1,718	\$49,536	\$1,657	\$47,879	28

Service Building RTU Replacement

Total Load Cool Load (Tons)	4	Exist SEER=	9.0	New SEER=	14	
Heating Capacity (MBH)	48	Exist AFUE=	-	New AFUE=	80%	Heat Pump COP = 3

HEATING ENERGY SAVINGS														
ELECTRIC HEAT PUMP VS GAS FIRED HEAT														
Ambient Bin Deg F	Avg. Temp DB (deg F)	R.H. Relative Humidity (%)	01-08 (Hrs)	09-16 (Hrs)	17-24 (Hrs)	Total Bin Hours During Occupy Hours	MBH	Therms/Yr	kWh Hrs/Yr	Existing EER / AFUE	Proposed EER / AFUE	Existing Unit kWh	Proposed Unit Therms	Cost Savings
50-55	52.5	62.51%	218	223	289	730.00	5	39	1,141	3.00	80%	380	48.67	\$3.92
45-50	47.5	59.88%	243	196	195	634.00	11	68	1,982	3.00	80%	661	84.53	\$6.81
40-45	42.5	66.11%	193	171	149	513.00	16	82	2,406	2.50	80%	962	102.60	\$29.37
35-40	37.5	69.31%	357	311	355	1,023.00	21	218	6,396	2.00	80%	3,198	272.80	\$162.26
30-35	32.5	68.99%	277	221	236	734.00	27	196	5,737	1.50	80%	3,824	244.67	\$271.35
25-30	27.5		159	98	134	391.00	32	125	3,667	1.00	80%	3,667	156.40	\$334.32
20-25	22.5		89	48	58	195.00	37	73	2,134	1.00	80%	2,134	91.00	\$194.52
15-20	17.5		74	20	31	125.00	43	53	1,563	1.00	80%	1,563	66.67	\$142.51
10-15	12.5		35	7	5	47.00	48	23	661	1.00	80%	661	28.20	\$60.28
5-10	7.5		17	9	8	34.00	48	16	478	1.00	80%	478	20.40	\$43.61
0-5	2.5		1	0	0	1.00	48	0	14	1.00	80%	14	0.60	\$1.28
-5-0	-2.5		0	0	0	0.00	48	0	0	1.00	80%	0	0.00	\$0.00
												1,117	17,543	\$1,250
COOLING ENERGY SAVINGS														
STANDARD vs HIGH EFFICIENCY (EER)														
Ambient Bin Deg F	Avg. Temp DB (deg F)	R.H. Relative Humidity (%)	01-08 (Hrs)	09-16 (Hrs)	17-24 (Hrs)	Total Bin Hours During Occupy Hours	Tons	Ton-Hrs/Yr	Existing EER	Proposed EER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)	Cost Savings
95-100	97.5	30.34%	0	5	1	6.00	4.0	24	9.0	10.5	32.00	27.43	4.57	\$0.60
90-95	92.5	42.55%	0	33	7	40.00	4.0	160	9.0	10.5	213.33	182.86	30.48	\$4.01
85-90	87.5	47.08%	0	92	30	122.00	3.4	418	9.0	10.5	557.71	478.04	79.67	\$10.49
80-85	82.5	52.20%	0	330	162	492.00	2.9	1,406	9.0	10.5	1,874.29	1,606.53	267.76	\$35.24
75-80	77.5	59.74%	0	257	265	522.00	2.3	1,193	9.0	10.5	1,590.86	1,363.59	227.27	\$29.91
70-75	72.5	64.93%	0	236	286	522.00	1.7	895	9.0	10.5	1,193.14	1,022.69	170.45	\$22.43
65-70	67.5	69.81%	0	204	216	420.00	1.1	480	9.0	10.5	640.00	548.57	91.43	\$12.03
60-65	62.5	69.39%	0	268	301	569.00	0.6	325	9.0	10.5	433.52	371.59	61.93	\$8.15
55-60	57.5	60.04%	0	191	192	383.00	0.0	0	9.0	10.5	0.00	0.00	0.00	\$0.00
						2,693.00	0.0				6,535	5,601	934	\$123

Elec Rate (\$/kWh)	\$0.132	Gas Rate (\$/Therm)	\$0.948
--------------------	---------	---------------------	---------

Number of Units	2
Cooling Total Saving, Kwh	1,867
Heating Total Saving, kWh	35,086
Heating Total Saving, Therms	-2,233
Total Savings, \$	\$2,746

Academic Building RTU Replacement (Computer Tech Lab Units)

Total Load Cool Load (Tons)	7.5	Exist SEER=	8.0	New EER=	11
Heating Capacity (MBH)		Exist AFUE=	-	New AFUE=	

COOLING ENERGY SAVINGS														
Ambient Bin Deg F	Avg. Temp DB (deg F)	R.H. Relative Humidity (%)	01-08 (Hrs)	09-16 (Hrs)	17-24 (Hrs)	Total Bin Hours During Occupy Hours	Tons	Ton-Hrs/Yr	Existing EER	Proposed EER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)	Cost Savings
95-100	97.5	30.34%	0.0	5.0	1.0	6.00	7.5	45	8.0	11.0	67.50	49.09	18.41	\$2.42
90-95	92.5	42.55%	0.0	33.0	7.0	40.00	7.5	300	8.0	11.0	450.00	327.27	122.73	\$16.15
85-90	87.5	47.08%	0.0	92.0	30.0	122.00	6.4	784	8.0	11.0	1,176.43	855.58	320.84	\$42.22
80-85	82.5	52.20%	0.0	330.0	162.0	492.00	5.4	2,636	8.0	11.0	3,953.57	2,875.32	1,078.25	\$141.90
75-80	77.5	59.74%	0.0	257.0	265.0	522.00	4.3	2,237	8.0	11.0	3,355.71	2,440.52	915.19	\$120.44
70-75	72.5	64.93%	0.0	236.0	286.0	522.00	3.2	1,678	8.0	11.0	2,516.79	1,830.39	686.40	\$90.33
65-70	67.5	69.81%	0.0	204.0	216.0	420.00	2.1	900	8.0	11.0	1,350.00	981.82	368.18	\$48.45
60-65	62.5	69.39%	0.0	268.0	301.0	569.00	1.1	610	8.0	11.0	914.46	665.06	249.40	\$32.82
55-60	57.5	60.04%	0.0	191.0	192.0	383.00	0	0	8.0	11.0	0.00	0.00	0.00	\$0.00
						2,693.00					13,784	10,025	3,759	\$495
Elec Rate (\$/kWh)		\$0.132	Gas Rate (\$/Therm)		\$0.948									

Number of Units	4
Cooling Total Saving, Kwh	15,038
Total Savings, \$	\$1,979

Academic Building RTU Replacement (Computer Tech Lab Units) - Incremental Analysis

Total Load Cool Load (Tons)	7.5	Standard EER=	10.0	New EER=	11
Heating Capacity (MBH)		Exist AFUE=	-	New AFUE=	

COOLING ENERGY SAVINGS														
Ambient Bin Deg F	Avg. Temp DB (deg F)	R.H. Relative Humidity (%)	01-08 (Hrs)	09-16 (Hrs)	17-24 (Hrs)	Total Bin Hours During Occupy Hours	Tons	Ton-Hrs/Yr	Existing EER	Proposed EER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)	Cost Savings
95-100	97.5	30.34%	0.0	5.0	1.0	6.00	7.5	45	9.6	11.0	56.25	49.09	7.16	\$0.94
90-95	92.5	42.55%	0.0	33.0	7.0	40.00	7.5	300	9.6	11.0	375.00	327.27	47.73	\$6.28
85-90	87.5	47.08%	0.0	92.0	30.0	122.00	6.4	784	9.6	11.0	980.36	855.58	124.77	\$16.42
80-85	82.5	52.20%	0.0	330.0	162.0	492.00	5.4	2,636	9.6	11.0	3,294.64	2,875.32	419.32	\$55.18
75-80	77.5	59.74%	0.0	257.0	265.0	522.00	4.3	2,237	9.6	11.0	2,796.43	2,440.52	355.91	\$46.84
70-75	72.5	64.93%	0.0	236.0	286.0	522.00	3.2	1,678	9.6	11.0	2,097.32	1,830.39	266.93	\$35.13
65-70	67.5	69.81%	0.0	204.0	216.0	420.00	2.1	900	9.6	11.0	1,125.00	981.82	143.18	\$18.84
60-65	62.5	69.39%	0.0	268.0	301.0	569.00	1.1	610	9.6	11.0	762.05	665.06	96.99	\$12.76
55-60	57.5	60.04%	0.0	191.0	192.0	383.00	0	0	9.6	11.0	0.00	0.00	0.00	\$0.00
						2,693.00					11,487	10,025	1,462	\$192
Elec Rate (\$/kWh)		\$0.132	Gas Rate (\$/Therm)		\$0.948									

Number of Units	4
Cooling Total Saving, Kwh	5,848
Total Savings, \$	\$770

Academic Building (Computer Tech Labs) 4 x 7.5 Ton High Efficiency vs Standard A/C Units Incremental Cost and Savings Analysis	
Incremental cost of Each Unit	\$2,000
Total Incremental Cost	\$8,000
Total Incremental Savings	\$770
Simple Payback	10.4

Administration Building AHU Replacement

HW and Chilled Water Coils for Heating and Cooling

Savings due to elimination of the AHU, which is in poor condition with major air leaks

Estimated Leakage Rate 10%
Total Cooling Capacity 42 Tons
Total Heating Capacity 500 MBH

Total Load Cool Load (Tons) due to leaks		4	Exist EER=	15.0	(Estimated based on chiller and boiler plants)									
Total Heating Load Due to Leaks (MBH)		50	Exist AFUE=	75%										
HEATING ENERGY SAVINGS														
Eliminate Air Leakage														
Ambient Bin Deg F	Avg. Temp DB (deg F)	R.H. Relative Humidity (%)	01-08 (Hrs)	09-16 (Hrs)	17-24 (Hrs)	Total Bin Hours During Occupy Hours	MBH	Therms/Yr	Existing AFUE	Proposed AFUE	Existing Unit Therms	New Unit Therms	Energy Savings Therms	Cost Savings
50-55	52.5	62.51%	218.0	223.0	289.0	730.00	6	41	75%	75%	54			
45-50	47.5	59.88%	243.0	196.0	195.0	634.00	11	70	75%	75%	94			
40-45	42.5	66.11%	193.0	171.0	149.0	513.00	17	86	75%	75%	114			
35-40	37.5	69.31%	357.0	311.0	355.0	1,023.00	22	227	75%	75%	303			
30-35	32.5	68.99%	277.0	221.0	236.0	734.00	28	204	75%	75%	272			
25-30	27.5		159.0	98.0	134.0	391.00	33	130	75%	75%	174			
20-25	22.5		89.0	48.0	58.0	195.00	39	76	75%	75%	101			
15-20	17.5		74.0	20.0	31.0	125.00	44	56	75%	75%	74			
10-15	12.5		35.0	7.0	5.0	47.00	50	24	75%	75%	31			
5-10	7.5		17.0	9.0	8.0	34.00	50	17	75%	75%	23			
0-5	2.5		1.0	0.0	0.0	1.00	50	1	75%	75%	1			
-5-0	-2.5		0.0	0.0	0.0	0.00	50	0	75%	75%	0			
											1,241			

COOLING ENERGY SAVINGS														
Eliminate Air Leakage														
Ambient Bin Deg F	Avg. Temp DB (deg F)	R.H. Relative Humidity (%)	01-08 (Hrs)	09-16 (Hrs)	17-24 (Hrs)	Total Bin Hours During Occupancy Hours	Tons	Ton-Hrs/Yr	Existing EER	Proposed EER	Existing Unit kWh	New Unit kWh	Energy Savings (kWh)	Cost Savings
95-100	97.5	30.34%	0.0	5.0	1.0	6.00	4	25	15.0	15.0	20			
90-95	92.5	42.55%	0.0	33.0	7.0	40.00	4	168	15.0	15.0	134			
85-90	87.5	47.08%	0.0	92.0	30.0	122.00	4	439	15.0	15.0	351			
80-85	82.5	52.20%	0.0	330.0	162.0	492.00	3	1,476	15.0	15.0	1,181			
75-80	77.5	59.74%	0.0	257.0	265.0	522.00	2	1,253	15.0	15.0	1,002			
70-75	72.5	64.93%	0.0	236.0	286.0	522.00	2	940	15.0	15.0	752			
65-70	67.5	69.81%	0.0	204.0	216.0	420.00	1	504	15.0	15.0	403			
60-65	62.5	69.39%	0.0	268.0	301.0	569.00	1	341	15.0	15.0	273			
55-60	57.5	60.04%	0.0	191.0	192.0	383.00	0	0	15.0	15.0	0			
						2,693.00					4,117			

Elec Rate (\$/kWh)	\$0.132	Gas Rate (\$/Therm)	\$0.948
--------------------	---------	---------------------	---------

Number of Units	1
Total Saving, Kwh	4,117
Total Saving, Therms	1,241
Total Savings, \$	\$1,718



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

ECM #14:

DOMESTIC HOT WATER HEATER EQUIPMENT REPLACEMENT

Domestic Water Heater Replacement

Gas Rate	\$0.948									
Electric Rate	\$0.132									
Building	Equipment	Quantity	Manfuacturer	Model Number	Fuel Type	Input Btu/h	Input Watts	Capacity (gallons)	Replace	Add Timer
Academic Building	DHW	1	A.O Smith	BTC-197	Natural Gas	197,000	N/A	100	Y	Y
Service Building	DHW	1	State	SRX75NQRT60	Natural Gas	75,100	N/A	75	Y	Y

Pipe Heat Loss During Unoccupied Periods

Building	Equipment	Diameter (in)	Length (ft)	Pipe Surface Area (sq.ft.)	Pipe Temp (°F)	Interior Space Temp (°F)	Hours per Year	Pipe Material	Emissivity	Estimated Insulation Thickness (in)	Insulated Pipe Thermal Conductivity (Btu-in/hr/ft^2/°F)	Heat Loss (BTU/hr/ft)	Energy Savings (MBTU/yr)	Energy Savings Gas (therms/yr)	Energy Savings Electricity (kWh/yr)
Academic Building	DHW Pipe	0.75	150	29.4	140	75	2,236	Copper	0.44	0.5	0.27	8.9	2,982	30	
Academic Building	DHW Pipe	0.75	50	9.8	140	75	2,236	Copper	0.44	0.5	0.27	8.9	994		291
Service Building	DHW Pipe	0.75	150	29.4	140	75	2,236	Copper	0.44	0.5	0.27	8.9	2,982	30	
Total													6,958	60	291

r1	r2	ln(r2/r1)
0.4	0.9	0.8
0.4	0.9	0.8
0.4	0.9	0.8

Material	Emissivity
Brass	0.05
Copper	0.44
Steel	0.94

Domestic Water Heater Replacement

<http://www.pexsupply.com/AO-Smith-BTX-100-LP-50-Gallon-100000-BTU-Cyclone-Xi-Power-Direct-Vent-Commercial-Gas-Water-Heater-LP>
<http://www.pexsupply.com/AO-Smith-BTH-199-100-Gallon-199000-BTU-Cyclone-Xi-Commercial-Gas-Water-Heater>

Academic Building Domestic Water Heater Replacement Heating Energy Savings

Estimated Natural Gas Usage kBtu/sf/yr	Area Serving SF	Total GasUsage kBtu/yr	Total GasUsage Therms	Existing Efficiency	Proposed Efficiency	Total DHW Generation (therms)	Proposed Gas Usage (therms)	Gas Savings (therms)	Savings \$	Installed Cost	Incentive	Cost after Incetives
5	40,000	200,000	2,000	75%	93%	1,500	1,613	387	\$366.97	\$12,000	\$50	\$11,950

Service Building Domestic Water Heater Replacement Heating Energy Savings												
Estimated Natural Gas Usage kBtu/sf/yr	Area Serving SF	Total GasUsage kBtu/yr	Total GasUsage Therms	Existing Efficiency	Proposed Efficiency	Total DHW Generation (therms)	Proposed Gas Usage (therms)	Gas Savings (therms)	Savings \$	Installed Cost	Incentive	Cost after Incetives
15	10,898	163,470	1,635	75%	93%	1,226	1,318	316	\$299.94	\$7,500	\$50	\$7,450

DWH Circulator Timer Savings								
Estimated Circulator Power Watts	Hours Savings	kWh Savings	Number of Timers	Total kWh savings	Total Savings \$	Cost Each	Cost Total	
50	2236	111.8	7	782.6	102.9119	\$300	\$2,100	

Total Savings kWh	Total Savings Therms	Total Savings \$	Total Cost \$	Total Incentives \$	Total Cost After Incentives \$
1,074	763	\$865	\$21,600	\$100	\$21,500

	Savings kWh	Savings Therms	Savings \$	Incentives	Cost		PB
Academic Building	515	417	\$463	\$50	\$12,600	\$12,550	27.1
Service Building	112	346	\$343	\$50	\$7,800	\$7,750	22.6



www.dome-tech.com

510 Thornall Street, Suite 170
Edison, NJ 08837
Tel: 732.590.0122
Fax: 732.590.0129

RENEWABLES CALCULATIONS

(Page left blank intentionally)

**CUMBERLAND COUNTY COLLEGE
RENEWABLE CALCULATIONS
SOLAR ENERGY**

Building	Academic Building	Conference Center	Navone Health Care	Service Center	Student Center	University Center	Total
Locations to Install Panels	Roof	Roof & Parking Lot	Roof	Roof	Roof	Roof & Parking Lot	
Assumptions							
System Capacity, kW-dc(maximum utilization of roof space)	35	386	66	47	27	305	866
Annual Electric Generation, kWhrs of AC electricity produced	46,832	515,147	88,460	62,442	36,425	406,654	1,155,959
Total Annual Facility Electric Use, kWhrs	1,057,207	513,193	357,414	240,944	648,368	386,885	3,204,009
% of Total Annual Usage	4%	100%	25%	26%	6%	105%	36%
All-In Cost of Electricity Year 1	0.1315	0.1315	0.1315	0.1315	0.1315	0.1315	0.1315
Annual Electric Cost Savings	\$6,158	\$67,742	\$11,632	\$8,211	\$4,790	\$53,475	\$152,009
Estimated SREC Value (Year 1)	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC	\$100 / SREC
Estimated year 1 SREC Revenue	\$4,683	\$51,515	\$8,846	\$6,244	\$3,642	\$40,665	\$115,596
Estimated Total Annual Revenue	\$10,842	\$119,257	\$20,478	\$14,455	\$8,432	\$94,140	\$267,604
Environmental Impact							
Equivalent Annual CO2 Emission Reduction (tons per year)	15.5	170.0	29.2	20.6	12.0	134.2	381.5
Equivalent Cars Removed From Road Annually	3	29	5	4	2	23	66
Equivalent Acres of Tress Planted Annually	4	46	8	6	3	37	104
Financial Results							
System Installed Cost	\$180,000	\$1,930,000	\$330,000	\$230,000	\$140,000	\$1,520,000	\$4,330,000
Simple Payback (Years)	17	16	16	16	17	16	16
IRR (25 Years)	-1%	-1%	0%	0%	-1%	0%	0%
Net Present Value (25 yrs, 4% discount rate)	\$37,761	\$407,798	\$80,942	\$59,964	\$29,370	\$369,238	\$1,040,723
Estimated CO2 Emissions Rate: 0.66 lbs/kWh				Annual Utility Cost Escalation Rate: 3%			
EPA Estimate: 11,560 CO2 per car				Annual system capacity loss: 0.5%			
EPA Estimate:7,333 lbs CO2 per acre of trees planted				Annual maintenance cost: \$12.5/kW			

**CUMBERLAND COUNTY COLLEGE
RENEWABLE CALCULATIONS
WIND ENERGY**

Wind Turbine Economics

	Ground Mounted, 5KW	Ground Mounted, 50 kW
Gross Installation Cost Estimate	\$1,560,000	\$750,000
Number of Units	50	3
Net Installation Cost Estimate	\$1,560,000	\$750,000
Annual Energy Savings	\$38,536	\$43,613
Simple Payback	40	17
System Capacity	250	150
Annual Avoided Energy Use, kWh*	292,835	331,416
% of Annual Electricity Use	4.8%	5.5%

Cumberland County College Total : 6,069,508 kWh (Annual)

**Calculation based on 5.6 m/s average wind speed*

GHG Emissions Reduction

117 Tons CO₂ / Yr

CHP Analysis

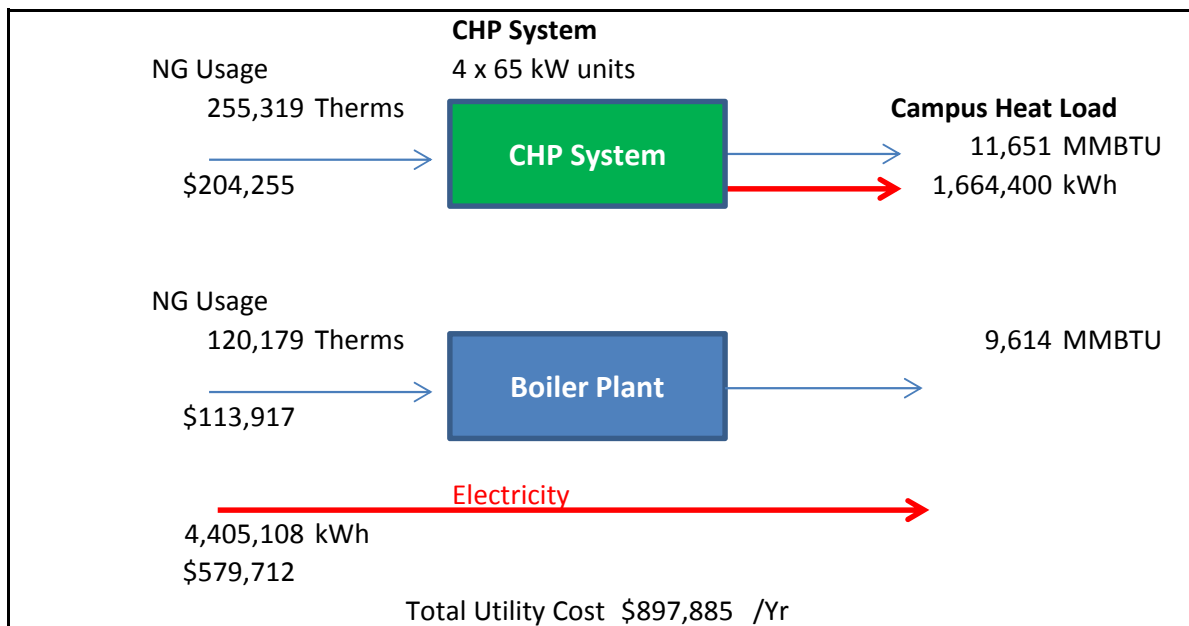
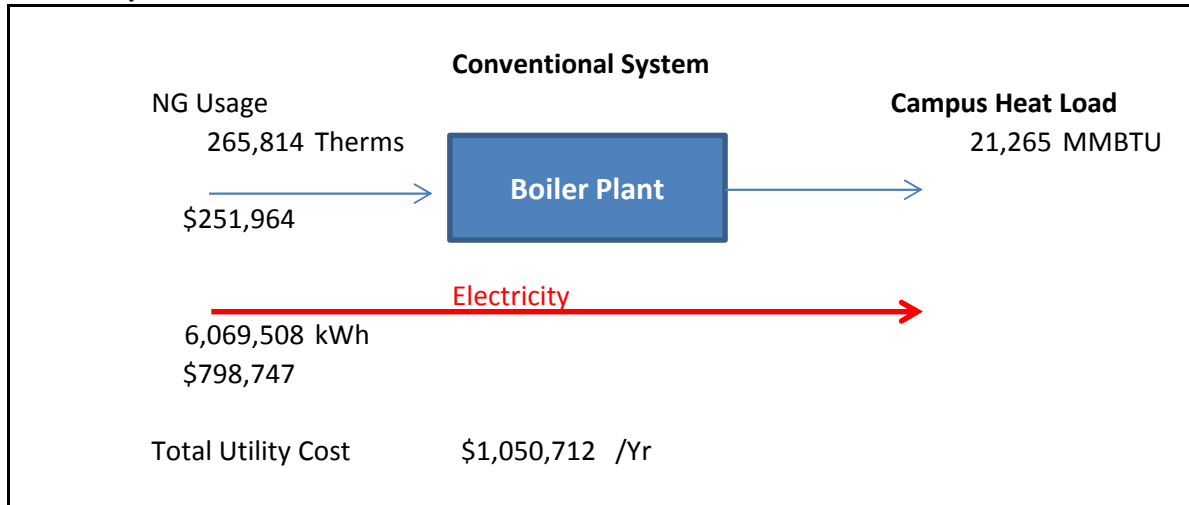
Campus Energy Usage (Vineland Electric)	2,457,300 kWh
Campus Energy Usage (Atlantic Electric)	3,612,208 kWh
Campus Total Electricity Usage	6,069,508 kWh
Campus Total Gas Usage	265,814 Therms/Yr
Campus Baseline Natural Gas Usage	12,789 Therms/Mo
Boiler Plant Efficiency	80%
Campus Baseline (Minimum) Heat Load	10,231 Therms/Mo
Average Baseline Heat Load	1,421 MBH
Number of 65kW Units Required	4
Estimated Total Heating Capacity of CHP Units	1,400 MBH
CHP Power Gross Power Output	260 kW
Auxilliary Equipment (Pumps, Gas Compressor Etc)	-60 kW
CHP Net Power Output	200 kW
Average CHP Heat Rate	11,800 Btu/kWh
Estimated Uptime	95%
Annual Hours of Operation	8,322 Hours
Annual Electricity Generation	2,163,720 kWh
Auxiliary Systems Usage	-499,320 kWh
Net Electricity Generation	1,664,400 kWh
Annual Thermal Energy Generation	116,508 Therms
Annual Fuel Consumption	255,319 Therms
Estimated Cost of Fuel (For Heating)	\$9.48 /MMBTU
Estimated Cost of Fuel (For Generation)	\$8.00 /MMBTU
Cost of Electricity which will be offset	\$0.13 /kWh
Total Annual CHP Fuel Cost	(\$204,255)
Net Annual Electricity Generation	\$219,035
Net Annual Heat Generation	\$138,047

Design Basis

Microturbine System with Hot Water Heat Recovery	
Microturbine Capacity	65 kW
Number of Units	4
Electrical Efficiency	26%
Fuel Input per unit	842 MBH
Heat Rate	11,800 BTU/kWh
Hot Water Heat Recovery per Unit	350 MBH

The system shall be interconnected to the Atlantic Energy Utility Grid

CHP Analysis



Total Utility Cost (Existing)	\$1,050,712 /Yr		
Total Utility Cost (with CHP)	\$897,885 /Yr	CHP Power Efcy	22%
Utility Cost Savings	\$152,827 /Yr	CHP Heat Efcy	46%
Maintenance Cost	(\$44,939) /Yr	Total Efcy	68%
Net Savings	\$107,888 /Yr		
CHP System Installed Cost	\$780,000		
Payback	7.2		

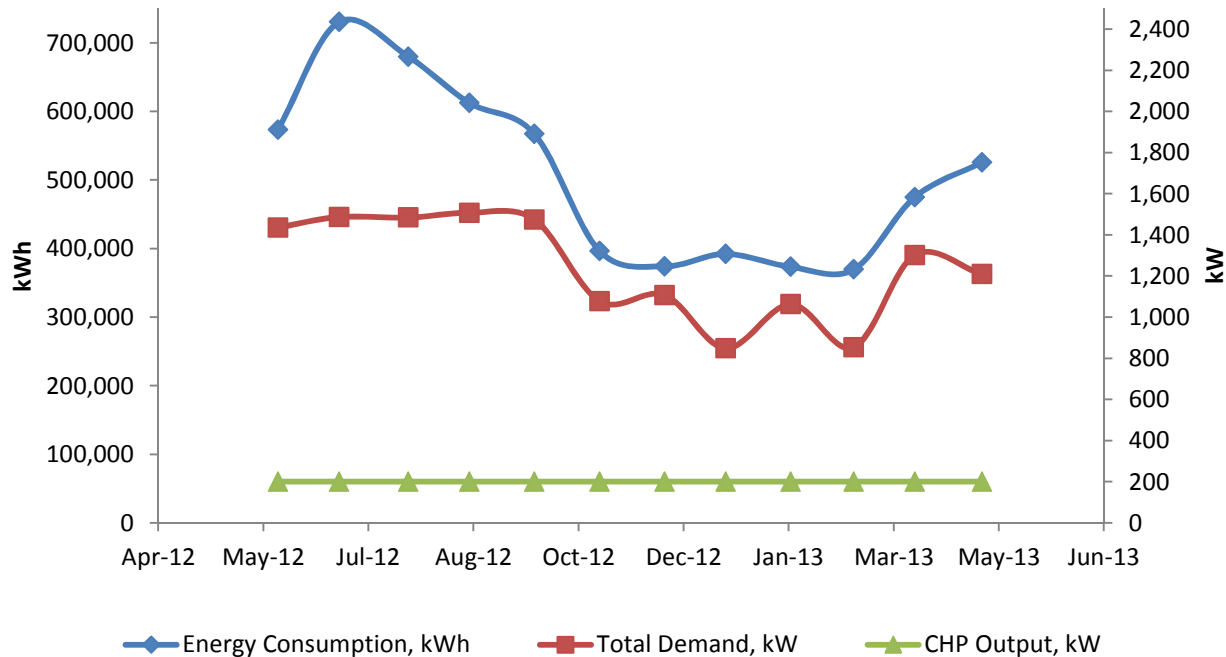
CHP Analysis

	Energy Consumption,	Total Demand, kW	CHP Output, kW
5/28/2012	573,263	1,435	200
6/26/2012	730,358	1,486	200
7/29/2012	679,862	1,484	200
8/27/2012	612,425	1,507	200
9/27/2012	567,116	1,474	200
10/28/2012	396,616	1,077	200
11/28/2012	374,212	1,107	200
12/27/2012	392,108	849	200
1/27/2013	373,292	1,063	200
2/26/2013	369,703	853	200
3/27/2013	474,841	1,302	200
4/28/2013	525,712	1,209	200

6,069,508

Demand Max	1,507
Demand Min	849

Proposed CHP System Profile



CHP Analysis

Spark Spread Analysis

Gas	Electricity	Payback
\$/MMBTU	\$/kWh	Years
\$6	\$0.17	3.4
\$6	\$0.13	4.9
\$6	\$0.10	7.1
\$8	\$0.10	13.3
\$8	\$0.13	7
\$8	\$0.17	4.5
\$12	\$0.10	None
\$12	\$0.13	121
\$12	\$0.17	10.7

This table proves that a CHP System's Economic Feasibility heavily depends on the cost of electricity and gas in the corresponding utility jurisdiction. The fluctuations in the utility cost may quickly make or break the feasibility.