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Local Government Energy Program
Energy Audit Final Report

Borough of Freehold

Department of Public Works Complex
161 Center Street
Freehold, NJ 07728

Project Number: LGEA55

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EXECUTIVE SUMMARY

The Freehold DPW complex is a single-story building with a total conditioned floor area of 16,000 square feet. The original structure was built in 1999, and there have been no major renovations or additions since then. The following chart provides an overview of current energy usage in the building based on the analysis period of January 2009 through December 2009:

Table 1: State of Building—Energy Usage

	Electric Usage, kWh/yr	Gas Usage, Therms/yr	Current Annual Cost of Energy, $	Site Energy Use Intensity, kBtu/sq ft yr	Joint Energy Consumption, MMBtu/yr
Current	76,304	7,150	22,835	60.0	975
Proposed	50,137	7,078	14,924	54.0	879
Savings	26,357	72	7,944	6.1	97
% Savings	35	1	35	10	10

There may be energy procurement opportunities for the DPW complex to reduce annual utility costs, which are $1,526 higher, when compared to the average estimated NJ commercial utility rates.

SWA has entered energy information about the DPW complex in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* energy benchmarking system. The DPW complex is categorized as a non-eligible ("Other") space type. Because it is an "Other" space type, there is no rating available. Consequently, the DPW complex is not eligible to receive a national energy performance rating at this time. The Site Energy Use Intensity is 60.0 $\frac{kBtu}{ft^2-yr}$ compared to the national average of a building consuming 77.0 $\frac{kBtu}{ft^2-yr}$. See ECM section for guidance on how to improve the building's rating.

Based on the current state of the building and its energy use, SWA recommends implementing various energy conservation measures from the savings detailed in Table 1. The measures are categorized by payback period in Table 2 below:

Table 2: Energy Conservation Measure Recommendations

ECMs	Savings ($)	Simple Payback Period (years)	Initial Investment, $	CO2 Savings, lbs/yr
0-5 Year	1,377	3.5	4,820	13,986
5-10 Year	6,535	7.9	51,546	33,660
>10 year	0	0	0	0
Total	7,912	7.1	56,366	47,646

SWA estimates that implementing the recommended ECMs is equivalent to removing approximately 7 cars from the roads each year or avoiding the need of 147 trees to absorb the annual CO_2 generated.

Other recommendations to increase building efficiency pertaining to operations and maintenance and capital improvements are listed below:

Further Recommendations:

SWA recommends that the DPW complex further explore the following:

- Capital Improvements
  - None

- Operations and Maintenance
  - Repair damaged and missing siding
  - Perform routine maintenance inspections of exterior shell
  - Adjust overhead doors to close completely and weather-strip
  - Provide water-efficient fixtures and controls
  - Always purchase the most energy-efficient equipment
  - Use smart power electric strips
  - Create an energy educational program

Financial Incentives and Other Program Opportunities

There are various incentive programs that the Borough of Freehold could apply for that could also help lower the cost of installing the ECMs. Please refer to Appendix F for details.

The Borough of Freehold DPW complex was built in 1999 and is better condition than most DPW garage-type buildings located throughout New Jersey. The building was built with exterior wall material that included insulation and also contains some insulation at the roof level. The building was observed to be sealed relatively tight with only minor thermal leaks. As such, SWA recommends that first damaged siding is replaced and overhead doors are adjusted to prevent thermal leaks. Once these issues are addressed, recommended measures should be undertaken that involve the heating and cooling loads of the building such as installing programmable thermostats.

A majority of the recommended ECMs reduce the electricity load by improving lighting fixtures, installing occupancy sensors for both lights and vending machines, as well as replacing older refrigerators and replacing the existing electric domestic hot water heater with a gas-fired unit. SWA recommends that all of these issues are addressed with the addition of installing a Solar Photovoltaic system. Currently, the incentives available for Solar Photovoltaic technology can significantly reduce the installed cost of the system as well as provide extra revenue through electricity generation as well as earning Solar Renewable Energy Credits (SRECs).

INTRODUCTION

Launched in 2008, the LGEA Program provides subsidized energy audits for municipal and local government-owned facilities, including offices, courtrooms, town halls, police and fire stations, sanitation buildings, transportation structures, schools and community centers. The Program will subsidize up to 100% of the cost of the audit. The Board of Public Utilities (BPUs) Office of Clean Energy has assigned TRC Solutions to administer the Program.

Steven Winter Associates, Inc. (SWA) is a 37-year-old architectural/engineering research and consulting firm, with specialized expertise in green technologies and procedures that improve the safety, performance, and cost effectiveness of buildings. SWA has a long-standing commitment to creating energy-efficient, cost-saving and resource-conserving buildings. As consultants on the built environment, SWA works closely with architects, developers, builders, and local, state, and federal agencies to develop and apply sustainable, 'whole building' strategies in a wide variety of building types: commercial, residential, educational and institutional.

SWA performed an energy audit and assessment for the DPW complex at 28 East Main Street. The process of the audit included facility visits on February 17, 2010, benchmarking and energy bills analysis, assessment of existing conditions, energy modeling, energy conservation measures and other recommendations for improvements. The scope of work includes providing a summary of current building conditions, current operating costs, potential savings, and investment costs to achieve these savings. The facility description includes energy usage, occupancy profiles and current building systems along with a detailed inventory of building energy systems, recommendations for improvement and recommendations for energy purchasing and procurement strategies.

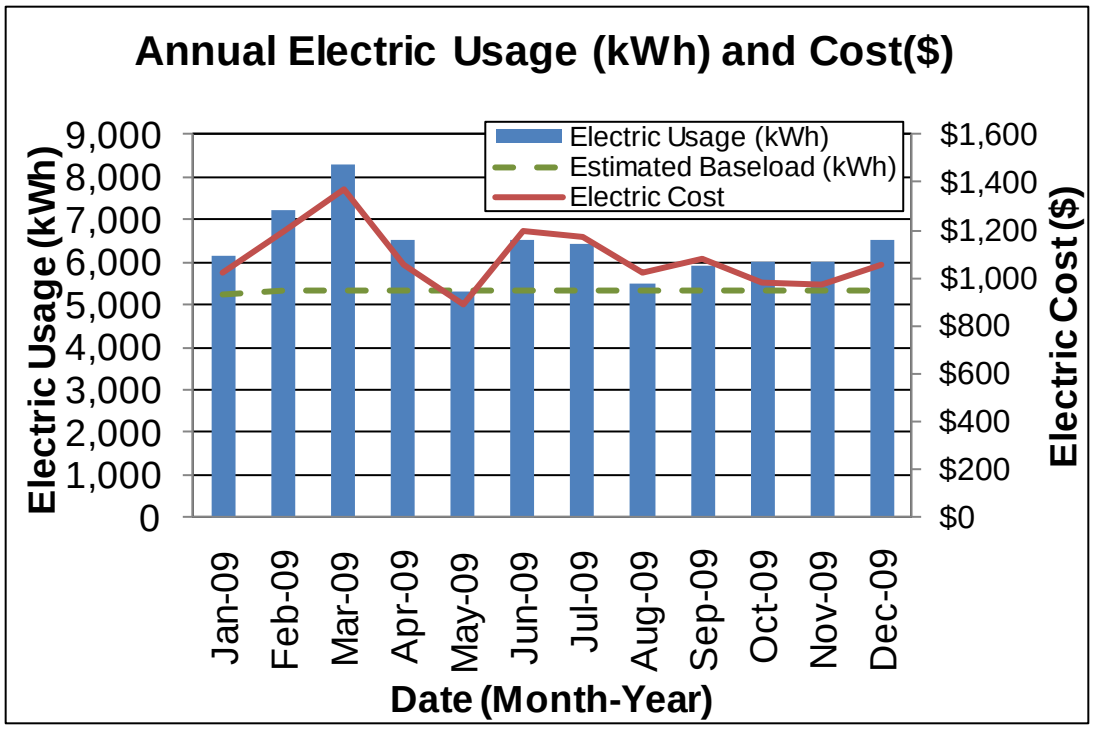
The goal of this Local Government Energy Audit (LGEA) is to provide sufficient information to the Borough of Freehold to make decisions regarding the implementation of the most appropriate and most cost-effective energy conservation measures for the DPW complex.

HISTORICAL ENERGY CONSUMPTION

1.1 Energy usage, load profile and cost analysis

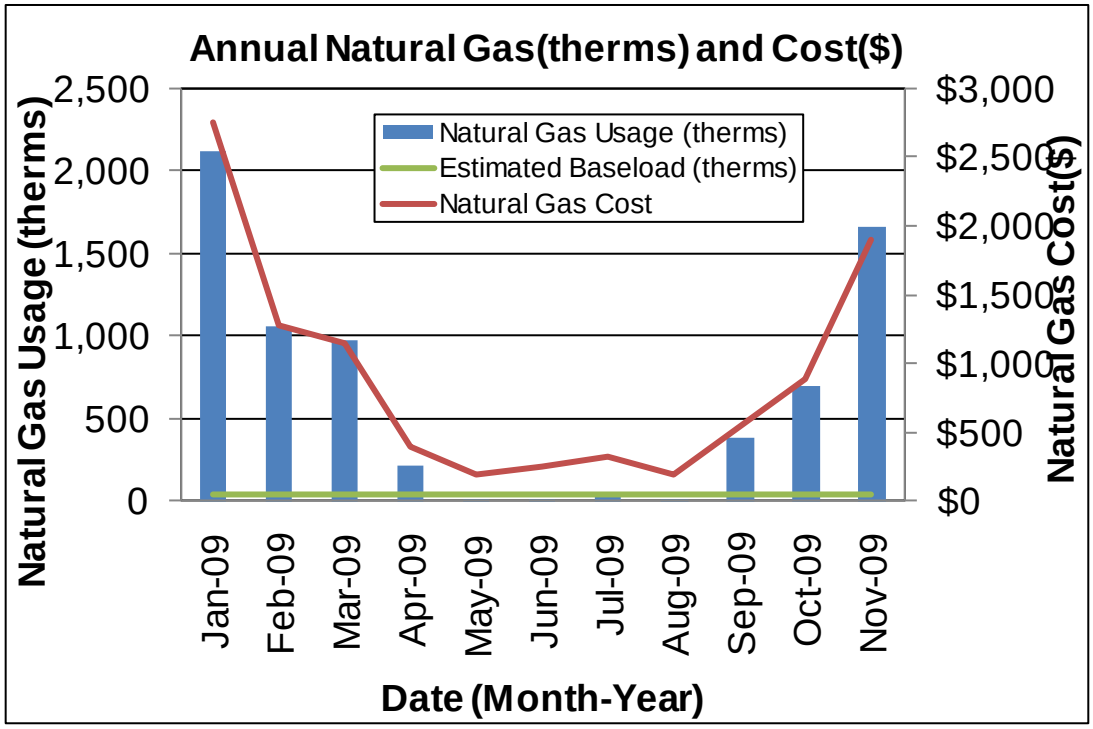
SWA reviewed utility bills from February 2008 through January 2010 that were received from the utility companies supplying the DPW complex with electric and natural gas. A 12 month period of analysis from January 2009 through December 2009 was used for all calculations and for purposes of benchmarking the building.

Electricity - The DPW complex is currently served by one electric meter. The DPW complex currently buys electricity from JCP&L at **an average aggregated rate of $0.170/kWh**. The DPW complex purchased **approximately 76,304 kWh, or $13,001 worth of electricity,** in the previous year. The average monthly demand was 21.5 kW and the annual peak demand was 22.7 kW.

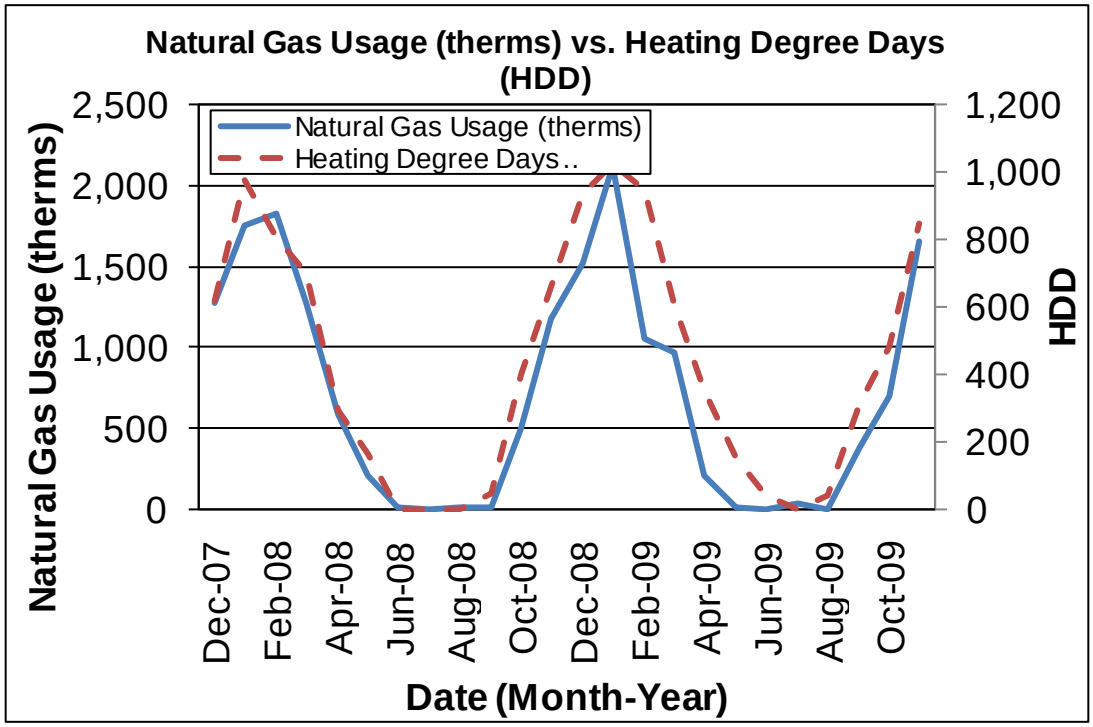


In the above chart, electricity use stays relative consistent throughout the year. There are small peaks during the summer to indicate increased electricity usage during the summer. There are also increases of electrical usage during the winter that may be the result of extended hours of use consistent with winter weather for the Department of Public Works.

Natural gas - The DPW complex is currently served by one meter for natural gas. The DPW complex currently buys natural gas from New Jersey Natural Gas Co. at **an average aggregated rate of $1.375/therm**. The DPW complex purchased **approximately 7,150 therms, or $9,834 worth of natural gas,** in the previous year.



In the above chart, natural gas usage increased as expected during the winter months as a result of increased heating load for the building.

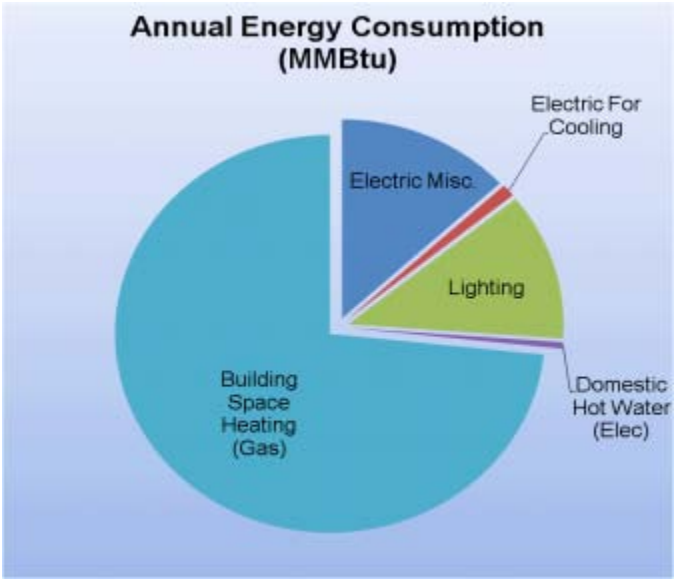


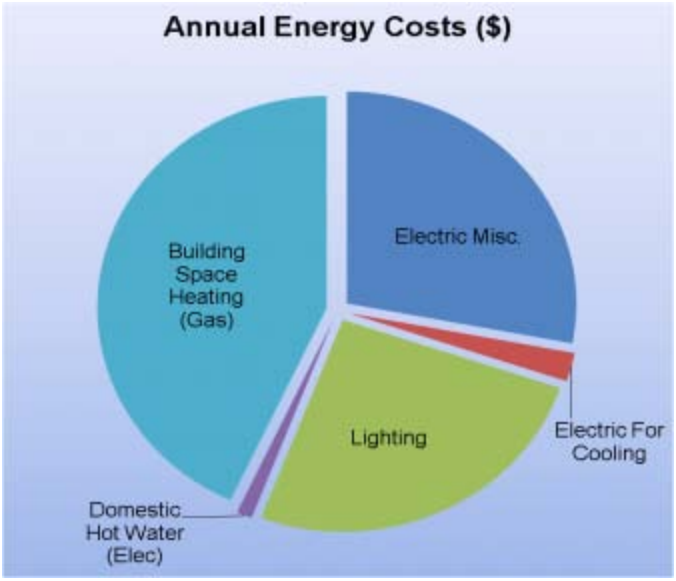
In the above chart, when comparing natural gas usage to heating degree days (HDD) for a two year period, the heating load of the building is consistent with weather-dependent heating loads. Heating degree days are a function of outside temperature and can be used to compare heating

loads of the building in order to determine if heating usage follows cold weather temperatures as expected.

The following graphs, pie charts, and table show energy use for the DPW complex based on utility bills for the 12 month period. Note: electrical cost at $50/MMBtu of energy is almost 4 times as expensive as natural gas at $14/MMBtu

2009 Annual Energy Consumption / Costs					
	MMBtu	% MMBtu	$	% $	$/MMBtu
Electric Miscellaneous	128	13%	$6,391	28%	50
Electric For Cooling	10	1%	$499	2%	50
Lighting	117	12%	$5,842	26%	50
Domestic Hot Water (Elec)	5	1%	$250	1%	50
Building Space Heating (Gas)	715	73%	$9,834	43%	14
Totals	975	100%	$22,835	100%	
Total Electric Usage	260	27%	$13,001	57%	50
Total Gas Usage	715	73%	$9,834	43%	14
Totals	975	100%	$22,835	100%	

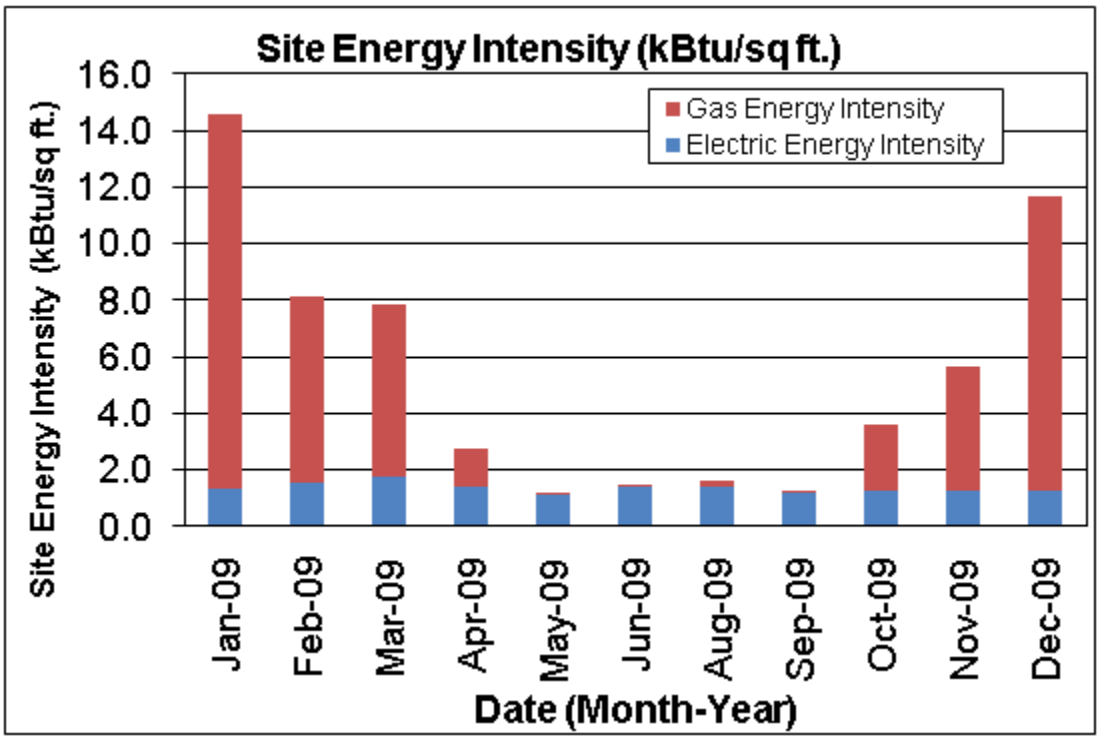




1.2. Energy Benchmarking

SWA has entered energy information about the DPW complex in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* energy benchmarking system. The DPW complex is categorized as a non-eligible ("Other") space type. Because it is an "Other" space type, there is no rating available. Consequently, the DPW complex is not eligible to receive a national energy performance rating at this time. The Site Energy Use Intensity is 60.0 $\frac{kBtu}{ft^2-yr}$ compared to the national average of a building consuming 77.0 $\frac{kBtu}{ft^2-yr}$. See ECM section for guidance on how to improve the building's rating.

Due to the nature of its calculation based upon a survey of existing buildings of varying usage, the national average for "Other" space types is very subjective, and is not an absolute bellwether for gauging performance.



Per the LGEA program requirements, SWA has assisted the borough of Freehold to create an *Energy Star Portfolio Manager* account and share the DPW complex's information to allow future data to be added and tracked using the benchmarking tool. SWA has shared this Portfolio Manager account information with the Municipality (user name of "boroughoffreehold" with a password of "*freehold")* and TRC Solutions.

1.2.1. Tariff analysis

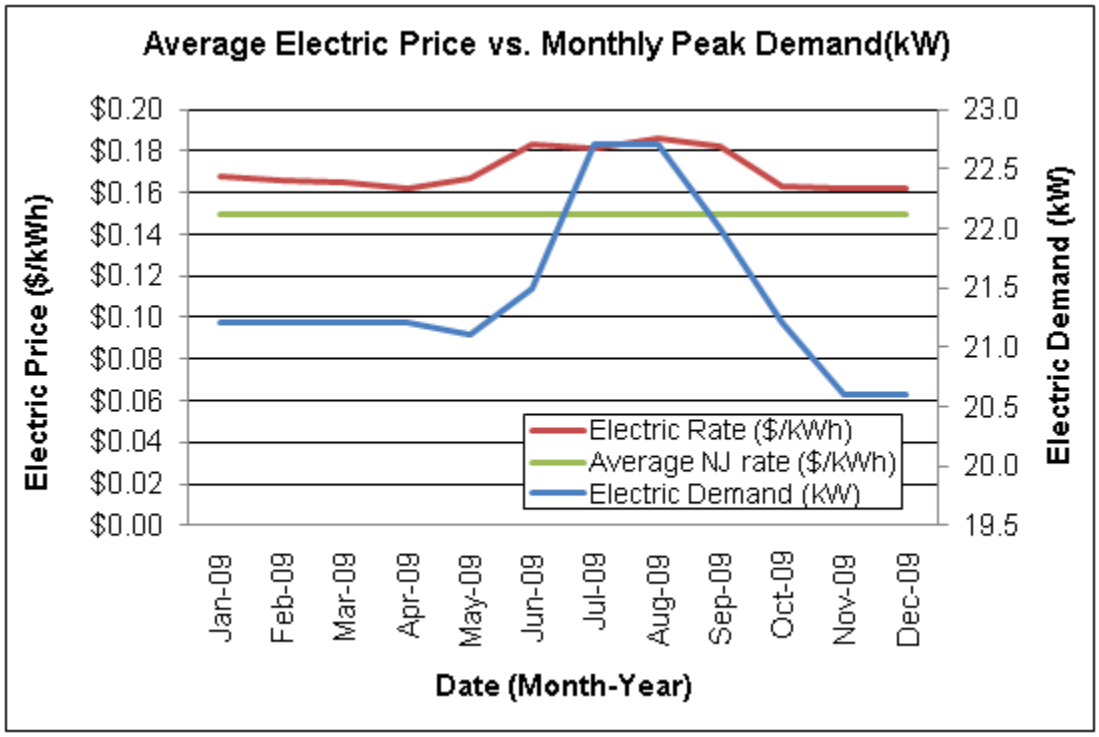
As part of the utility bill analysis, SWA evaluated the current utility rates and tariffs. Tariffs are typically assigned to buildings based on size and building type.

Tariff analysis is performed to determine if the rate that a municipality is contracted to pay with each utility provider is the best rate possible resulting in the lowest costs for electric and gas provision. Typically, the natural gas prices increase during the heating months when natural gas is used by the hot water boiler units. Some high gas price per therm fluctuations in the summer may be due to high energy costs that recently occurred and low use caps for the non-heating months. Typically, electricity prices also increase during the cooling months when electricity is used by the air conditioning units.

The supplier charges a market-rate price based on use, and the billing does not break down demand costs for all periods because usage and demand are included in the rate. Currently, the borough of Freehold is paying a general service rate for natural gas. Demand is not broken out in the bill. Thus the building pays for fixed costs such as meter reading charges during the summer months. The building is direct metered and currently purchases electricity at a general service rate for usage with an additional charge for electrical demand factored into each monthly bill. There general service rate for electric charges are market-rate based on use. Demand prices are reflected in the utility bills and can be verified by observing the price fluctuations throughout the year.

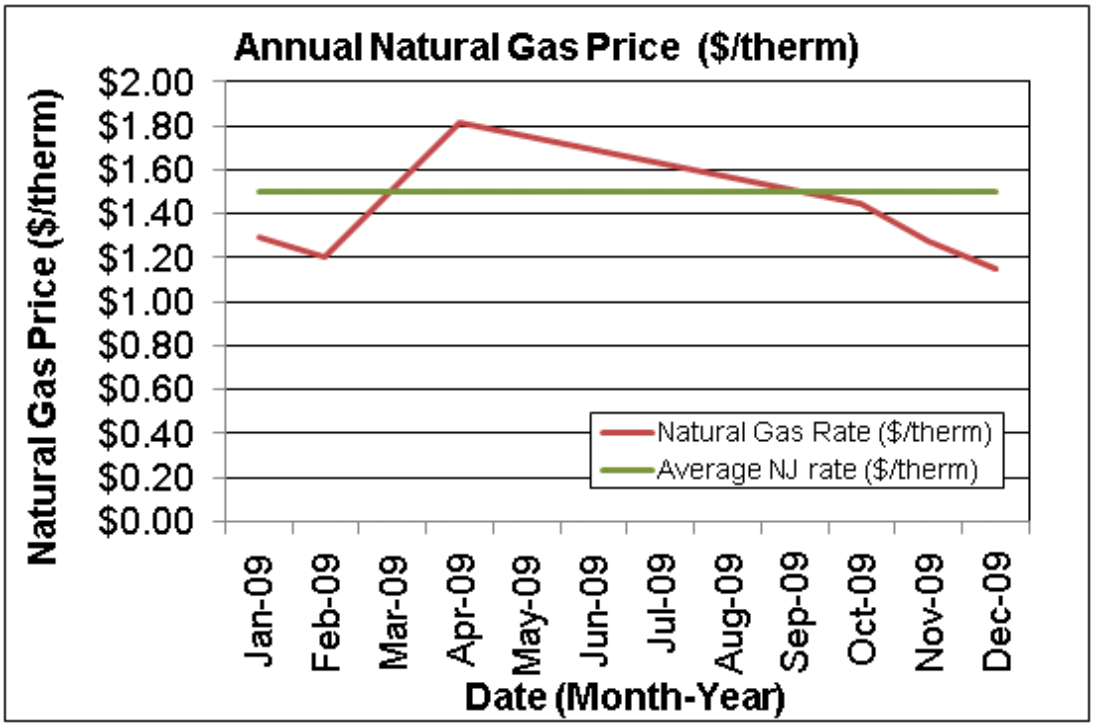
1.2.2. Energy Procurement strategies

The average estimated NJ commercial utility rates for electric are $0.150/kWh, while the DPW complex pays a rate of $0.170/kWh. The DPW complex's annual electric utility costs are $1,526 higher, when compared to the average estimated NJ commercial utility rates. Electric bill analysis shows fluctuations up to 13% over the most recent 12 month period.



The above chart shows the electricity cost ($/kWh) when compared to the average NJ cost ($/kWh). Electric demand (kW) is also shown in order to correspond to price increases with fluctuation in electrical demand. The building electricity cost ($/kWh) is consistently higher than the average NJ cost ($/kWh).

The average estimated NJ commercial utility rates for gas are $1.550/therm, while the DPW complex pays a rate of $1.375/therm. Natural gas bill analysis shows fluctuations up to 37% over the most recent 12 month period.



The above chart shows that the average natural gas cost ($/therm) is mostly lower than the average NJ natural gas cost ($/therm) except for the period of April 2009 when there maybe a billing anomaly.

Utility rate fluctuations may have been caused by adjustments between estimated and actual meter readings; others may be due to unusual high and recent escalating energy costs.

SWA recommends that the DPW complex further explore opportunities of purchasing both natural gas and electricity from third-party suppliers in order to reduce rate fluctuation and ultimately reduce the annual cost of energy for the DPW complex. Appendix C contains a complete list of third-party energy suppliers for the borough of Freehold service area.

EXISTING FACILITY AND SYSTEMS DESCRIPTION

This section gives an overview of the current state of the facility and systems. Please refer to the Proposed Further Recommendations section for recommendations for improvement.

Based on visits from SWA on dates, the following data was collected and analyzed.

2.1. Building Characteristics

- Free-standing, single-story, slab on grade building with.
- Constructed in 1999 with no additions or architectural alterations.
- Approximately 16,000 square feet of conditioned space
- The building houses administrative offices for the various departments of the DPW, meeting rooms, workshops and two garage bays.

2.2. Building occupancy profiles

- Typical occupancy of 45 hours per week.
- The building is open on weekdays from 7:00 AM to 3:30 PM and some of the garage and workshop portions may be used during emergency conditions.
- The DPW complex is occupied by 20 full time employees.

2.3. Building envelope

This is an overview of the current state of the building. SWA has included recommendations to improve the efficiency and sustainability of the building. Implementing the suggestions will reduce the energy demand.

2.3.1. Exterior Walls

Example of section with damaged siding and typical exterior wall in good condition.

The exterior wall envelope is mostly constructed of a vertical metal panel system over a steel frame with 1/4 " of detectable insulation. The interior is mostly unfinished.

Note: Wall insulation levels could visually be verified in the field by non-dectructive methods.

2.3.2. Roof

The building's roof is predominantly a low-pitch shed type over a metal structure, with a standing-seam metal finish. It is original and has never been replaced. Two and a half inches of assumed roof insulation were recorded.

Note: Roof insulation levels could not be verified in the field, and are based on reports from building management.

Roofs, related flashing, gutters and downspouts were inspected during the field audit. They were reported to be in overall good condition, with no signs of uncontrolled moisture, air-leakage or other energy-compromising issues detected on all roof areas.

The following typical roof surface was identified:

Typical roof and view of the steel structure from the interior

2.3.3. Base

The building's base is a 6" concrete slab-on grade with a perimeter footing. There weren't any moisture or water-related issues reported or detected.

2.3.4. Windows

Windows were found, double-glazed, mostly fixed aluminum frame units in good condition and interior shading devices in the form of vertical blinds, as well as some side light and transom units installed in the door assembly and glass panels in the doors.


Cracked caulking at windows

2.3.5. Exterior doors

The overhead aluminum exterior doors were inspected and observed to be in overall good condition, as was the glass door system in the main entrance. However, the metal door with glass panels was observed to not close with an air tight seal due to improperly installed door frame and missing weather-stripping.




Door does not close with an air tight seal and is missing weather stripping

2.3.6. Building air tightness

The building was observed to be relatively air tight with the exception of the overhead doors and slight exterior wall damages.

The air tightness of buildings helps to maximize other implemented energy measures and investments, and minimizes long-term maintenance and repair cost.

2.4. Mechanical Systems

The DPW complex consists of one large garage-type building with office spaces built within the garage structure. The office areas are distinctly separated from the garage space by interior walls and a structurally-supported ceiling with storage on top. The office spaces are conditioned separately from the garage spaces.

View of interior garage space with storage located on top of office area

Equipment

Heating is provided to the office areas through a Carrier air handling unit mounted on-top of the office ceiling. This air handler also acts as a split air conditioning system with a condenser unit located outside that is connected to a cooling coil within the air handling unit. This Carrier split system has an AFUE heating thermal efficiency of 91.0% and a cooling SEER value of 9.5. The system was observed to be in good condition with approximately 30% of remaining useful life. The unit is controlled by a White-Rodgers programmable thermostat located in the office space.

Carrier air handling unit located above office spaces

Carrier condensing unit located on front side of building

The general garage area does not contain cooling equipment and is heated by eight (8) Reznor, gas-fired convective heating units. These units are ceiling mounted and are controlled by non-programmable thermostats. These units were accessed by a ladder but did not contain any physical nameplate information with unit specifications nor were there available drawings to confirm system capacities and efficiencies. Based on field inspections, these units were operating in good condition and have approximately 30% of the useful lifetime left.

Reznor gas-fired convective heating unit

Distribution Systems

The Carrier air handling unit is located directly above the office space and is ducted directly into the office space with return ductwork as well. The Reznor heating units located in the garage space provide convective heating directly to the building space with no ductwork involved.

Controls

As mentioned above, the office areas are conditioned using a single Carrier air handling unit that acts as a gas-fired furnace with split system air conditioning. This unit is controlled by a single White-Rodgers programmable thermostat located in the office space. This unit was observed to be programmed correctly to setback temperatures at night and on the weekends.

Each Reznor heating unit located in the garage space is controlled by a non-programmable, dial-type thermostat mounted on the wall at the ground level. According to maintenance staff, building employees are responsible for reducing temperatures at night before their shift ends. SWA observed that at least 1 of these thermostats was broken, allowing the unit heater to be operated 24 hours per day. In general, the thermostats were typically set for 75ºF, while registering an air temperature of only 60ºF. Due to the nature of the building operating as a garage, large volumes of air are lost whenever an overhead door opens. With high thermostat settings, excessive heat is used to overcompensate for lost air, allowing excessive energy to be consumed.

2.4.1. Domestic Hot Water

The domestic hot water (DHW) for the Freehold DPW complex is provided by a Bradford-White electric heater with 60 gallons of storage capacity. According to the energy use label,

this unit uses 4,825 kWh/year to produce domestic hot water. This unit is located in close proximity to the gas-fired Carrier air handling unit.

Bradford-White electric domestic hot water heater

This heater has 10% estimated useful operating life remaining and should be replaced.

2.5. Electrical systems

2.5.1. Lighting

See attached lighting schedule in Appendix B for a complete inventory of lighting throughout the building including estimated power consumption and proposed lighting recommendations.

Interior Lighting - The DPW complex currently contains mostly recessed and ceiling suspended T12 fixtures, recessed incandescent and high bay metal halide fixtures. Based on measurements of lighting levels for each space, there are no vastly over-illuminated areas.

Exit Lights - Exit signs were found to be LED type.

Exterior Lighting - The exterior lighting surveyed during the building audit was found to wall pack Metal Halide fixtures. Exterior lighting is controlled by manual timers that were adjusted properly to daylight hours.

2.5.2. Appliances and process

SWA has conducted a general survey of larger, installed equipment. Appliances and other miscellaneous equipment account for a significant portion of electrical usage within the building. Typically, appliances are referred to as “plug-load” equipment, since they are not inherent to the building’s systems, but rather plug into an electrical outlet. Equipment such as process motors, computers, computer servers, radio and dispatch equipment,

refrigerators, vending machines, printers, etc. all create an electrical load on the building that is hard to separate out from the rest of the building's energy usage based on utility analysis.

2.5.3. Elevators

The DPW complex does not have an installed elevator.

2.5.4. Other electrical systems

There are not currently any other significant energy-impacting electrical systems installed at the DPW complex.

RENEWABLE AND DISTRIBUTED ENERGY MEASURES

3.1. Existing systems

Currently there are no renewable energy systems installed in the building.

3.2. Evaluated Systems

SWA evaluated the following renewable and distributed energy measure possibilities: wind, solar photovoltaic, solar thermal collectors, combined heat and power, and geothermal.

Solar Photovoltaic

Based on utility analysis and a study of roof conditions, the DPW complex would be a good candidate for a Solar Panel installation. There is sufficient roof space for panels to reasonably supplement the power consumption of the building. The Solar Photovoltaic system would help offset electrical costs by allowing the building to generate their own electricity and sell it back to the utility grid. Solar Renewable Energy Credits (SRECs) could be earned for the building which would provide the building with additional credits that could be sold to the utility company in order to generate additional revenue.

Solar Thermal Collectors

Solar thermal collectors are not cost-effective for this building and would not be recommended due to the insufficient and intermittent use of domestic hot water throughout the building to justify the expenditure.

Geothermal

The DPW complex is not a good candidate for geothermal installation since it would require replacement of the entire existing HVAC system, of which major components still have between 30% and 40% remaining useful life.

Combined Heat and Power

The DPW complex is not a good candidate for CHP installation and would not be cost-effective due to the size and operations of the building. Typically, CHP is best suited for

buildings with a high electrical baseload to accommodate the electricity generated, as well as a means for using waste heat generated. Typical applications include buildings with an absorption chiller, where waste heat would be used efficiently.

PROPOSED ENERGY CONSERVATION MEASURES

Energy Conservation Measures (ECMs) are recommendations determined for the building based on improvements over current building conditions. ECMs have been determined for the building based on installed cost, as well as energy and cost-savings opportunities.

Recommendations: Energy Conservation Measures

ECM#	Description of ECMs with 0-5 Year Payback
1	Install (1) VendingMiser device on non-refrigerated vending machine
2	Install (2) new CFL lamps
3	Install (1) VendingMiser device on refrigerated vending machine
4	Install (8) Programmable Thermostats
5	Install (4) new Occupancy Sensors
6	Replace electric DHW with gas-fired unit
	Description of ECMs with 5-10 Year Payback
7	Replace (2) compact refrigerators with 2.7 cu. Ft. ENERGY STAR models
8	Replace (1) garage refrigerator with a 17 cu. Ft. ENERGY STAR model
9	Install a 5 kW Solar Photovoltaic system
10	Install (60) new T8 fluorescent lighting fixtures
11	Install (36) new pulse start metal halide fixtures

ECM#1: ***Install (1) VendingMiser device on non-refrigerated vending machine***

On the days of the site visits, SWA observed that the DPW complex contained one non-refrigerated ("Snack") vending machine. A simple plug and play device both the VendingMiser™ and SnackMiser™ devices are compatible with refrigerated vending machines and non-refrigerated vending machines respectively. They both utilize Passive Infrared Sensors (PIR) to help the unit save power. This unit is to be installed on the existing non-refrigerated vending machine.

Installation cost:

Estimated installed cost: $99 (includes $15 of labor)
Source of cost estimate: Manufacturer Costs

Economics:

ECM #	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
1	99	512	0.1	0	0.1	0	87	5	435	1.1	3	1	1	297	917

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis. Calculations were performed using the VendingMiser savings calculators located online at http://www.usatech.com/energy_management/energy_calculator.php

Rebates/financial incentives:

- *None*

Please see Appendix F for more information on Incentive Programs.

ECM#2: *Install (2) new CFL lamps*

On the day of the site visit, SWA completed a lighting inventory of the Borough of Freehold DPW complex (see Appendix B). The existing lighting inventory contained 2 inefficient incandescent lamps. SWA recommends that each incandescent lamp is replaced with a more efficient, Compact Fluorescent Lamp (CFL). CFLs are capable of providing equivalent or better light output while using less power.

Installation cost:

Estimated installed cost: $74 (includes $44 of labor)
Source of cost estimate: RS *Means; Published and established costs, NJ Clean Energy Program*

Economics:

ECM #	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
2	74	84	0.0	0	0.0	25	39	5	196	1.9	2	0	0	105	150

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis. SWA also assumed an aggregated 5 hrs/yr to replace aging burnt out lamps vs. newly installed.

Rebates/financial incentives:

- *None*

Please see Appendix F for more information on Incentive Programs.

ECM#3: *Install (1) VendingMiser device on refrigerated vending machine*

On the days of the site visits, SWA observed that the DPW complex contained one non-refrigerated ("Snack") vending machine. A simple plug and play device both the VendingMiser™ and SnackMiser™ devices are compatible with refrigerated vending machines and non-refrigerated vending machines respectively. They both utilize Passive Infrared Sensors (PIR) to help the unit save power. This unit is to be installed on the existing non-refrigerated vending machine.

Installation cost:

Estimated installed cost: $199 (includes $30 of labor)
Source of cost estimate: Manufacturer Costs

Economics:

ECM #	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
3	199	533	0.1	0	0.1	0	91	5	453	2.2	1	0	0	214	954

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis. Calculations were performed using the VendingMiser savings calculators located online at http://www.usatech.com/energy_management/energy_calculator.php

Rebates/financial incentives:

- *None*

Please see Appendix F for more information on Incentive Programs.

ECM#4: *Install (8) Programmable Thermostats*

On the day of the site visit, SWA observed that each of the eight (8) Reznor, gas-fired unit heaters located in the garage areas are controlled with a non-programmable thermostat. Of these 8 units, at least 1 thermostat was broken and needs to be replaced. SWA recommends retro-fitting each unit heater with a programmable thermostat that can reduce setpoint temperatures at night when the garage is not being used. SWA recommends that programmable thermostats with a manual override are installed. The manual override option would allow any employees that needed to work outside of typical hours to override the automatic programming and would allow them to adjust the setpoint for a period of 2 hours. Once the building is well-sealed, the thermostat temperature should also be lowered from 75º to a more reasonable temperature such as 70ºF. Currently, the temperature setpoint is left higher than required to account for heated air that is lost through the garage doors when they are closed as well as opened temporarily.

Installation cost:

Estimated installed cost: $976 (includes $240 of labor)
Source of cost estimate: RS *Means; Published and established costs, NJ Clean Energy Program, ENERGY STAR®*

Economics:

ECM #	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
4	976	0	0.0	237	1.5	0	326	15	4,888	3.0	4	0	0	2,859	2,612

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis. SWA assumed that temperatures would be setback based on the operation schedule of the building.

Rebates/financial incentives:

- *None*

Please see Appendix F for more information on Incentive Programs.

ECM#5: *Install (4) new Occupancy Sensors*

On the day of the site visit, SWA observed that the DPW complex did not contain any lighting that was operated via occupancy sensors. SWA identified four areas within the DPW complex that could benefit from the installation of occupancy sensors. Please see Appendix B for a detailed lighting inventory.

Installation cost:

Estimated installed cost: $800 (includes $200 of labor)
Source of cost estimate: RS *Means; Published and established costs, NJ Clean Energy Program, ENERGY STAR®*

Economics:

ECM #	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
5	800	1,414	0.3	0	0.3	0	240	15	3,606	3.3	4	0	0	2,029	2,532

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis.

Rebates/financial incentives:

- *NJ Clean Energy – SmartStart – Wall-mounted occupancy sensors ($80 per sensor).*

Please see Appendix F for more information on Incentive Programs.

ECM#6: *Replace electric DHW heater with gas-fired unit*

On the day of the site visit, SWA observed that the domestic hot water (DHW) loads of the building were met by an electric, 60 gallon DHW heater. Electric DHW heaters consume electricity constantly in order to keep stored hot water at a set temperature. SWA recommends that this unit is replaced with a gas-fired unit. The office portion of the DPW complex is a separate structure within the garage area itself. All office-related mechanical equipment is mounted above the office ceiling and is easy to access. Based on the proximity of the DHW unit to the gas-fired air handler, costs for extending the gas line or moving the DHW unit closer to the gas line will be minimal. Upgrading this unit will not result in energy savings but will result in cost savings by switching to a less expensive fuel.

Installation cost:

Estimated installed cost: $2,672 (includes $467 of labor)
Source of cost estimate: RS *Means; Published and established costs, NJ Clean Energy Program*

Economics:

ECM #	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
6	2,672	4,825	0.8	-165	0.0	0	593	15	8,901	4.5	2	0	0	4,310	6,820

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis. SWA assumed cost savings based on average utility costs calculated for the DPW complex. To estimate potential incentives, SWA assumes that the unit is equivalent to a 100 MBH, gas-fired DHW heater.

Rebates/financial incentives:

- *NJ Clean Energy – SmartStart – Gas Water Heaters >50 gallons ($2 per MBH)*

Please see Appendix F for more information on Incentive Programs.

ECM#7: *Replace (2) compact refrigerators with 2.7 cu. Ft. ENERGY STAR models*

On the day of the site visit, SWA observed that there were two old refrigerators, both 2.7 cu. ft. model that are not ENERGY STAR rated (using approximately 254 kWh/year). Appliances, such as refrigerators, that are over 10 years of age should be replaced with newer efficient models with the Energy Star label. SWA recommends the replacement of the smaller GE unit and Avanti with a 2.7 cf. ft. ENERGY STAR® model or equivalent. Besides saving energy, the replacement will also keep their surroundings cooler. When compared to the average electrical consumption of older equipment, Energy Star equipment results in large savings. Look for the Energy Star label when replacing appliances and equipment, including: window air conditioners, refrigerators, printers, computers, copy machines, etc. More information can be found in the "Products" section of the Energy Star website at: http://www.energystar.gov.

Installation cost:

Estimated installed cost: $396 (Includes $30 in labor cost)
Source of cost estimate: *Manufacturer and Store established costs*

Economics:

ECM #	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
7	396	380	0.0	0	0.1	0	65	12	775	6.1	1	0	0	239	680

Assumptions: SWA calculated the savings for this measure using measurements taken the day of the field visit and using the billing analysis aggregate utility rate.

Rebates/financial incentives:

- *None*

Please see Appendix F for more information on Incentive Programs.

ECM#8: *Replace (1) garage refrigerator with a 17 cu. Ft. ENERGY STAR model*

Description:

On the day of the site visit, SWA observed that there was one old refrigerator, a 17 cu. ft. model in the building which was not Energy Star rated (using approximately 773 kWh/year). Appliances, such as refrigerators, that are over 10 years of age should be replaced with newer efficient models with the Energy Star label. SWA recommends the replacement of the existing GE refrigerator with a 17 cu. ft. top freezer refrigerator ENERGY STAR®. Besides saving energy, the replacement will also keep their surroundings cooler. When compared to the average electrical consumption of older equipment, Energy Star equipment results in large savings. Look for the Energy Star label when replacing appliances and equipment, including: window air conditioners, refrigerators, printers, computers, copy machines, etc. More information can be found in the "Products" section of the Energy Star website at: http://www.energystar.gov.

Installation cost:

Estimated installed cost: $475 (Includes $30 in labor cost)
Source of cost estimate: *Manufacturer and Store established costs*

Economics:

ECM #	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
8	475	425	0.1	0	0.1	0	72	12	867	6.6	1	0	0	236	761

Assumptions: SWA calculated the savings for this measure using measurements taken the day of the field visit and using the billing analysis aggregate utility rate.

Rebates/financial incentives:

- *None*

Please see Appendix F for more information on Incentive Programs.

ECM#9: *Install a 5 kW Solar Photovoltaic system*

Description:

Currently, the DPW complex does not use any renewable energy systems. Renewable energy systems such as photovoltaic panels, can be mounted on the building roofs, and can offset a portion of the purchased electricity for the building. Power stations generally have two separate electrical charges: usage and demand. Usage is the amount of electricity in kilowatt-hours that a building uses from month to month. Demand is the amount of electrical power that a building uses at any given instance in a month period. During the summer periods, when electric demand at a power station is high due to the amount of air conditioners, lights, equipment, etc. being used within the region, demand charges go up to offset the utility's cost to provide enough electricity at that given time. Photovoltaic systems not only offset the amount of electricity use by a building, but also reduce the building's electrical demand, resulting in a higher cost savings as well. The DPW complex is not eligible for a 30% federal tax credit, available only to residential buildings. Instead, the Borough of Freehold may consider applying for a grant and / or engage a PV generator / leaser who would install the PV system and then sell the power at a reduced rate. JCP&L provides the ability to buy SRECs at $600 / MWh or best market offer. There are several possible locations for a 5 kW PV installation on the building roofs and away from shade.

Installation cost:

Estimated installed cost: $30,000 (Includes $12,000 in labor cost)
Source of cost estimate: *Similar Projects*

Economics:

ECM #	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
9	30,000	5,900	5.0	0	1.3	0	4,003	25	100,075	7.5	2	0	0	22,384	10,564

Assumptions: SWA calculated the savings for this measure using measurements taken the day of the field visit and using the billing analysis aggregate utility rate. SWA estimated the cost and savings of the system based on past PV projects. SWA projected physical dimensions based on a typical Polycrystalline Solar Panel (230 Watts, model #ND-U230C1). PV systems are sized based on Watts and physical dimensions for an array will differ with the efficiency of a given solar panel (W/sq ft). A commercial multi-crystalline 230 Watts panel (37.0 volts, 8.24 amps) has 17.5 square feet of surface area (13. 1 Watts per square foot). A 5 kW system needs approximately 22 panels, which would take up 385 square feet. The installation of a renewable Solar Photovoltaic power generating system could also serve as a good educational tool and exhibit for the community.

Rebates/financial incentives:

- *NJ Clean Energy – Renewable Energy Incentive Program (REIP) (based on$1 per Watt installed for systems under 50kW)*
- *NJ Clean Energy – Solar Renewable Energy Certificate (SREC) program. Each time a system generates 1,000 kWh (1MWh) of electricity, a SREC is issued which can then be sold or traded separately from the power. The building must also become net-metered in order to earn SREC's as well as sell power back to the electric grid. A total of $3,000/year has been incorporated into the above costs for a period of 15 years, however it requires proof of performance, application approval and negotiations with the utility.*

Please see Appendix F for more information on Incentive Programs.

ECM#10: *Install (60) new T8 fluorescent fixtures*

On the day of the site visit, SWA completed a lighting inventory of the Borough of Freehold Library (see Appendix B). The existing lighting inventory contained mostly inefficient T12 fluorescent fixtures with magnetic ballasts. SWA recommends replacing each existing fixture with more efficient, T8 fluorescent fixtures with electronic ballasts. T8 fixtures with electronic ballasts provide equivalent or better light output while reducing energy consumption by 30% when compared to a T12 fixture with magnetic ballast.

Installation cost:

Estimated installed cost: $6,068 (includes $1,800 of labor)
Source of cost estimate: RS *Means; Published and established costs, NJ Clean Energy Program*

Economics:

ECM #	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
10	6,068	2,921	0.6	0	0.6	252	749	15	11,229	8.1	1	0	0	2,740	5,230

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis. SWA also assumed an aggregated 5 hrs/yr to replace aging burnt out lamps vs. newly installed.

Rebates/financial incentives:

- *NJ Clean Energy – SmartStart – T8 fixtures with electronic ballasts ($15 per fixture)*

Please see Appendix F for more information on Incentive Programs.

ECM#11: *Install (36) new pulse start metal halide fixtures*

On the day of the site visit, SWA completed a lighting inventory of the Borough of Freehold DPW complex (see Appendix B). The existing lighting inventory contained many inefficient Probe Start Metal Halide fixtures located in the garage bays and on the exterior of the building. SWA recommends replacing each existing fixture with more efficient, pulse start metal halide. Pulse start metal halides can be installed at lower wattages than probe start technology since the quality of light does not degrade over time, which is anticipated when sizing a probe start metal halide fixture.

Installation cost:

Estimated installed cost: $14,805 (includes $2,160 of labor)
Source of cost estimate: RS *Means; Published and established costs, NJ Clean Energy Program*

Economics:

ECM #	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
11	14,805	9,363	2.0	0	2.0	87	1,679	15	25,181	8.8	1	0	0	4,948	16,764

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis. SWA also assumed an aggregated 5 hrs/yr to replace aging burnt out lamps vs. newly installed.

Rebates/financial incentives:

- *NJ Clean Energy – SmartStart – Metal Halide with Pulse Start ($25 per fixture)*

Please see Appendix F for more information on Incentive Programs.

PROPOSED FURTHER RECOMMENDATIONS

Capital Improvements

Capital Improvements are recommendations for the building that may not be cost-effective at the current time, but that could yield a significant long-term payback. These recommendations should typically be considered as part of a long-term capital improvement plan. Capital improvements should be considered if additional funds are made available, or if the installed costs can be shared with other improvements, such as major building renovations. SWA recommends the following capital improvements for the DPW complex:

- None

Operations and Maintenance

Operations and Maintenance measures consist of low/no cost measures that are within the capability of the current building staff to handle. These measures typically require little investment, and they yield a short payback period. These measures may address equipment settings or staff operations that, when addressed will reduce energy consumption or costs.

- Repair damaged and missing siding – SWA observed several areas around the perimeter, especially on the backside of the building, where siding has been damaged or missing. SWA recommends replacing this siding to prevent water and moisture penetration which will ultimately lead to costly repairs and energy losses.

- Perform routine maintenance inspections of exterior shell of building – SWA recommends that the Borough of Freehold perform biannual maintenance inspections to reduce unnecessary energy losses through the shell of the building. Inspections should be focused on penetrations in the building shell that allow unwanted heat, air and moisture to be transported across the building envelope. Inspections should include insulation levels, windows, doors, siding, roof surfaces, etc.

- Adjust overhead doors to close completely and weather-strip – SWA recommends that each overhead door is adjusted in order to ensure that they close properly. In addition to adjusting the door, weather-stripping should be repaired and added as necessary to ensure that the doors form a proper seal with the framed wall and building base.

- Provide water-efficient fixtures and controls - Adding controlled on/off timers on all lavatory faucets is a cost-effective way to reduce domestic hot water demand and save water. Building staff can also easily install faucet aerators and/or low-flow fixtures to reduce water consumption. There are many retrofit options, which can be installed now or incorporated as equipment is replaced. Routine maintenance practices that identify and quickly address water leaks are a low-cost way to save water and energy. Retrofitting with more efficient water-consumption fixtures/appliances will reduce energy consumption for water heating, while also decreasing water/sewer bills.

- Always purchase the most energy-efficient equipment, including Energy Star labeled appliances, when equipment is installed or replaced. More information can be found in the "Products" section of the Energy Star website at: http://www.energystar.gov.

- Use smart power electric strips - in conjunction with occupancy sensors to power down computer equipment when left unattended for extended periods of time.

- Create an energy educational program - that teaches how to minimize energy use. The U.S. Department of Energy offers free information for hosting energy efficiency educational programs and plans. For more information please visit: http://www1.eere.energy.gov/education/.

APPENDIX A: EQUIPMENT LIST

Inventory

Building System	Description	Location	Make/ Model	Fuel	Space Served	Date Installed	Estimated Remaining Useful Life %
Heating	AHU; Carrier gas-fired furnace with cooling coil, forced air furnace, 91.0% AFUE, no nameplate was found on this unit	In garage, on top of ceiling above office areas	Carrier, Model #NA, Serial #NA	Natural Gas/ Electricity	Office Areas	2000	30%
Cooling	CU; Carrier condensing unit connected to gas-fired furnace with cooling coil above office ceiling, R-22 refrigerant, 60,000 BTUH (17.6 kW), 9.5 EER	Exterior of building, front	Carrier, Model #38CKC060520, Serial #0800E24041	Electricity	Office Areas	2000	30%
Controls	White-Rodgers programmable thermostat	Office Space, moutned on wall	White-Rodgers, Comfort Set II	Electricity	Air handling unit/ Office Areas	2000	30%
Heating	Eight (8) Reznor unit heaters locate in garage area, no nameplates were located on these units, all units are connected to non-programmable thermosats	Perimeter of garage area, hung from ceiling	Reznor, Model #NA, Serial #NA	Natural Gas	Garage Area	2000	30%
Ventilation	Two (2) large exhaust fans for garage areas, clears exhaust from garage when activated by switch or alarm, no nameplate info available	One on each side of garage	No nameplate info	Electricity	Garage Area	2000	40%
Domestic Hot Water	Bradford-White electric hot water heater, 60 gallons storage capacity, According to Energy Star lable uses 4,825 kWh/year, Model # taken from energy star label	In garage, on top of ceiling above office areas	Bradford-White, Hydrojet, Model #LD50S33 B060	Electricity	Office Areas	1994	10%
Lighting	See Appendix A	-	-	-	-	-	-

Note: The remaining useful life of a system (in %) is an estimate based on the system date of built and existing conditions derived from visual inspection.

Appendix B: Lighting Study

Location			Existing Fixture Information												Retrofit Information												Annual Savings		
Marker	Floor	Room Identification	Fixture Type	Ballast	Lamp Type	# of Fixtures	# of Lamps per Fixture	Watts per Lamp	Controls	Operational Hours per Day	Operational Days per Year	Ballast Wattage	Total Watts	Energy Use kWh/year	Category	Fixture Type	Lamp Type	Ballast	Controls	# of Fixtures	# of Lamps per Fixture	Watts per Lamp	Operational Hours per Day	Operational Days per Year	Ballast Watts	Total Watts	Energy Use kWh/year	Fixture Savings (kWh)	Controls Savings (kWh)	Total Savings (kWh)
1	1	Office - Street Department	Recessed	M	4'T12	6	3	40	Sw	9	261	12	792	1,860	T8	Recessed	4'T8	E	OS	6	3	32	7	261	5	606	1068	437	356	793
2	1	Vestibule	Recessed	M	4'T12	1	2	40	Sw	9	261	12	92	216	T8	Recessed	4'T8	E	Sw	1	2	32	9	261	5	69	162	54	0	54
3	1	Office - Water & Sewer Departmer	Recessed	M	4'T12	6	3	40	Sw	9	261	12	792	1,860	T8	Recessed	4'T8	E	OS	6	3	32	7	261	5	606	1068	437	356	793
4	1	Bathroom Women	Recessed	M	4'T12	1	3	40	Sw	4	261	12	132	138	T8	Recessed	4'T8	E	Sw	1	3	32	4	261	5	101	105	32	0	32
5	1	Bathroom Women	Recessed	M	4'T12 U-Shapec	1	2	40	Sw	4	261	12	92	96	T8	Recessed	4'T8 U-Shaped	E	Sw	1	2	32	4	261	5	69	72	24	0	24
6	1	Shower	Recessed	S	Inc	2	1	60	Sw	4	261	0	120	125	CFL	Recessed	CFL	S	Sw	2	1	20	4	261	0	40	42	84	0	84
7	1	Bathroom Men	Recessed	M	4'T12	5	3	40	Sw	4	261	12	660	689	T8	Recessed	4'T8	E	Sw	5	3	32	4	261	5	505	527	162	0	162
8	1	Bathroom Men	Recessed	M	4'T12 U-Shapec	1	2	40	Sw	4	261	12	92	96	T8	Recessed	4'T8 U-Shaped	E	Sw	1	2	32	4	261	5	69	72	24	0	24
9	1	Lunch Room	Recessed	M	4'T12	5	3	40	Sw	9	261	12	660	1,550	T8	Recessed	4'T8	E	OS	5	3	32	7	261	5	505	890	364	297	661
10	1	Hallway	Recessed	M	4'T12	3	2	40	Sw	9	261	12	276	648	T8	Recessed	4'T8	E	Sw	3	2	32	9	261	5	207	486	162	0	162
11	1	Hallway	Exit Sign	S	LED	1	1	5	N	24	365	1	6	48	N/A	Exit Sign	LED	S	N	1	1	5	24	365	1	6	48	0	0	0
12	1	Wash Area	Parabolic Ceiling Suspendec	M	4'T12	2	2	40	Sw	9	261	12	184	432	T8	Parabolic Ceiling Suspendec	4'T8	E	Sw	2	2	32	9	261	5	138	324	108	0	108
13	1	Storage Room	Parabolic Ceiling Suspendec	M	4'T12	4	2	40	Sw	2	261	12	368	192	T8	Parabolic Ceiling Suspendec	4'T8	E	Sw	4	2	32	2	261	5	276	144	48	0	48
14	1	Maintenance Department	Parabolic Ceiling Suspendec	M	4'T12	10	2	40	Sw	9	261	12	920	2,161	T8	Parabolic Ceiling Suspendec	4'T8	E	OS	10	2	32	7	261	5	690	1216	540	405	945
15	1	Garage Bay	High Bay	E	MH	12	1	175	Sw	9	261	49	2,688	6,314	PSMH	High Bay	PSMH	E	Sw	12	1	100	9	261	20	1440	3383	2932	0	2932
16	1	Garage Bay	Exit Sign	S	LED	2	1	5	N	24	365	1	11	96	N/A	Exit Sign	LED	S	N	2	1	5	24	365	1	11	96	0	0	0
17	Mezz	Garage Bay	Parabolic Ceiling Suspendec	M	4'T12	15	1	40	Sw	9	261	12	780	1,832	T8	Parabolic Ceiling Suspendec	4'T8	E	Sw	15	1	32	9	261	5	555	1304	529	0	529
18	1	Garage Bay 2	High Bay	E	MH	16	1	175	Sw	9	261	49	3,584	8,419	PSMH	High Bay	PSMH	E	Sw	16	1	100	9	261	20	1920	4510	3909	0	3909
19	1	Garage Bay 2	Exit Sign	S	LED	2	1	5	N	24	365	1	11	96	N/A	Exit Sign	LED	S	N	2	1	5	24	365	1	11	96	0	0	0
20	1	Workshop	Parabolic Ceiling Suspendec	E	4'T8	4	2	32	Sw	9	261	5	276	648	N/A	Parabolic Ceiling Suspendec	4'T8	E	Sw	4	2	32	9	261	5	276	648	0	0	0
21	Ext	Exterior	Flood	E	MH	8	1	150	T	12	365	42	1,536	6,728	PSMH	Flood	PSMH	E	T	8	1	100	12	365	20	960	4205	2523	0	2523
Totals:						107	39	1,127				303	14,072	34,247						107	39	783			132	9,060	20,466	12,368	1,414	13,781

Rows Highlighed Yellow Indicate an Energy Conservation Measure is recommended for that space

Proposed Lighting Summary Table			
Total Gross Floor Area (SF)	16,000		
Average Power Cost ($/kWh)	0.1700		
Total Interior Lighting	**Existing**	**Proposed**	**Savings**
Annual Consumption (kWh)	11,136	7,752	**3,384**
Lighting Power (watts)	5,560	3,809	**1,752**
Lighting Power Density (watts/SF)	1.39	0.95	**0.44**
Estimated Cost of Fixture Replacement ($)	22,747		
Estimated Cost of Controls Improvements ($)	880		
Total Consumption Cost Savings ($)	**1,112**		

Legend:

Fixture Type	Lamp Type	Control Type	Ballast Type	Retrofit Category
Exit Sign	LED	N (None)	N/A (None)	N/A (None)
Screw-in	Inc (Incandescent)	S (Switch)	E (Electronic)	T8 (Installl new T8)
Pin	1'T5	OS (Occupancy Sensor)	M (Magnetic)	T5 (Install new T5)
Parabolic	2'T5	T (Timer)		CFL (Install new CFL)
Recessed	3'T5	PC (Photocell)		LEDex (Install new LED Exit)
2'U-shape	4'T5	D (Dimming)		LED (Install new LED)
Circiline	2'T8	DL (Daylight Sensor)		D (Delamping)
Exterior	3'T8	M (Microphonic Sensor)		C (Controls Only)
HID (High Intensity Discharge)	4'T8			
	6'T8			
	8'T8			
	2'T12			
	3'T12			
	4'T12			
	6'T12			
	8'T12			
	CFL (Compact Fluorescent Lightbulb)			
	MR16			
	Halogen			
	MV (Mercury Vapor)			
	MH (Metal Halide)			
	HPS (High Pressure Sodium			
	LPS (Low Pressure Sodium)			

APPENDIX C: THIRD PARTY ENERGY SUPPLIERS

http://www.state.nj.us/bpu/commercial/shopping.html

Third Party Electric Suppliers for JCPL Service Territory	Telephone & Web Site
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com
BOC Energy Services, Inc. 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.boc.com
Commerce Energy, Inc. 4400 Route 9 South, Suite 100 Freehold, NJ 07728	(800) 556-8457 www.commerceenergy.com
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827 www.newenergy.com
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com
FirstEnergy Solutions 300 Madison Avenue Morristown, NJ 07926	(800) 977-0500 www.fes.com
Glacial Energy of New Jersey, Inc. 207 LaRoche Avenue Harrington Park, NJ 07640	(877) 569-2841 www.glacialenergy.com
Integrys Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integrysenergy.com
Liberty Power Delaware, LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(866) 769-3799 www.libertypowercorp.com
Liberty Power Holdings, LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663	(800) 363-7499 www.libertypowercorp.com
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) 363-7499 www.pepco-services.com
PPL EnergyPlus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com
Sempra Energy Solutions 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.semprasolutions.com
South Jersey Energy Company One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 www.southjerseyenergy.com
Suez Energy Resources NA, Inc. 333 Thornall Street, 6th Floor Edison, NJ 08837	(888) 644-1014 www.suezenergyresources.com
UGI Energy Services, Inc. 704 East Main Street, Suite 1 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com

Third Party Gas Suppliers for NJNG Service Territory	Telephone & Web Site
Cooperative Industries 412-420 Washington Avenue Belleville, NJ 07109	(800) 628-9427 www.cooperativenet.com
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	(800) 805-8586 www.gesc.com
UGI Energy Services, Inc. 704 East Main Street, Suite 1 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com
Intelligent Energy 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	(800) 724-1880 www.intelligentenergy.org
Metromedia Energy, Inc. 6 Industrial Way Eatontown, NJ 07724	(877) 750-7046 www.metromediaenergy.com
MxEnergy, Inc. 510 Thornall Street, Suite 270 Edison, NJ 08837	(800) 375-1277 www.mxenergy.com
NATGASCO (Mitchell Supreme) 532 Freeman Street Orange, NJ 07050	(800) 840-4427 www.natgasco.com
NJ Gas & Electric 1 Bridge Plaza, Fl. 2 Fort Lee, NJ 07024	(866) 568-0290 www.NewJerseyGasElectric.com
Pepco Energy Services, Inc. 112 Main Street Lebanon, NJ 08833	(800) 363-7499 www.pepco-services.com
PPL EnergyPlus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com
South Jersey Energy Company One South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 756-3749 www.southjerseyenergy.com
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 www.spragueenergy.com
Woodruff Energy 73 Water Street Bridgeton, NJ 08302	(800) 557-1121 www.woodruffenergy.com

APPENDIX D: GLOSSARY AND METHOD OF CALCULATIONS

Glossary of ECM Terms

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Net ECM Cost: The net ECM cost is the cost experienced by the customer, which is typically the total cost (materials + labor) of installing the measure minus any available incentives. Both the total cost and the incentive amounts are expressed in the summary for each ECM.

Annual Energy Cost Savings (AECS): This value is determined by the audit firm based on the calculated energy savings (kWh or Therm) of each ECM and the calculated energy costs of the building.

Lifetime Energy Cost Savings (LECS): This measure estimates the energy cost savings over the lifetime of the ECM. It can be a simple estimation based on fixed energy costs. If desired, this value can factor in an annual increase in energy costs as long as the source is provided.

Simple Payback: This is a simple measure that displays how long the ECM will take to break-even based on the annual energy and maintenance savings of the measure.

ECM Lifetime: This is included with each ECM so that the owner can see how long the ECM will be in place and whether or not it will exceed the simple payback period. Additional guidance for calculating ECM lifetimes can be found below. This value can come from manufacturer's rated lifetime or warranty, the ASHRAE rated lifetime, or any other valid source.

Operating Cost Savings (OCS): This calculation is an annual operating savings for the ECM. It is the difference in the operating, maintenance, and/or equipment replacement costs of the existing case versus the ECM. In the case where an ECM lifetime will be longer than the existing measure (such as LED lighting versus fluorescent) the operating savings will factor in the cost of replacing the units to match the lifetime of the ECM. In this case or in one where one-time repairs are made, the total replacement/repair sum is averaged over the lifetime of the ECM.

Return on Investment (ROI): The ROI is expresses the percentage return of the investment based on the lifetime cost savings of the ECM. This value can be included as an annual or lifetime value, or both.

Net Present Value (NPV): The NPV calculates the present value of an investment's future cash flows based on the time value of money, which is accounted for by a discount rate (assumes bond rate of 3.2%).

Internal Rate of Return (IRR): The IRR expresses an annual rate that results in a break-even point for the investment. If the owner is currently experiencing a lower return on their capital than the IRR, the project is financially advantageous. This measure also allows the owner to compare ECMs against each other to determine the most appealing choices.

Calculation References

ECM = Energy Conservation Measure
AOCS = Annual Operating Cost Savings
AECS = Annual Energy Cost Savings
LOCS = Lifetime Operating Cost Savings
LECS = Lifetime Energy Cost Savings
LCS = Lifetime Cost Savings

NPV = Net Present Value
IRR = Internal Rate of Return
DR = Discount Rate

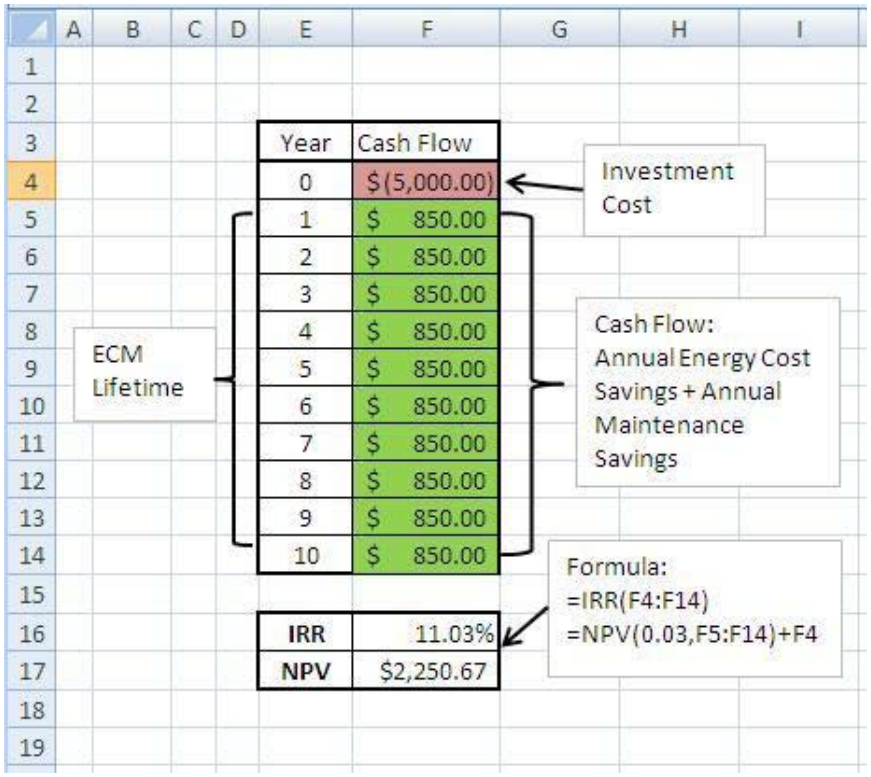
Net ECM Cost = Total ECM Cost – Incentive
LECS = AECS X ECM Lifetime
AOCS = LOCS / ECM Lifetime
LCS = LOCS+LECS

Note: The lifetime operating cost savings are all avoided operating, maintenance, and / or component replacement costs over the lifetime of the ECM. This can be the sum of any annual operating savings, recurring or bulk (i.e. one-time repairs) maintenance savings, or the savings that comes from avoiding equipment replacement needed for the existing measure to meet the lifetime of the ECM (e.g. lighting change outs).

Simple Payback = Net ECM Cost / (AECS + AOCS)
Lifetime ROI = (LECS + LOCS – Net ECM Cost) / Net ECM Cost
Annual ROI = (Lifetime ROI / Lifetime) = (AECS + OCS) / Net ECM Cost – 1 / Lifetime
It is easiest to calculate the NPV and IRR using a spreadsheet program like Excel.

Excel NPV and IRR Calculation

In Excel, function =IRR(values) and =NPV(rate, values) are used to quickly calculate the IRR and NPV of a series of annual cash flows. The investment cost will typically be a negative cash flow at year 0 (total cost - incentive) with years 1 through the lifetime receiving a positive cash flow from the annual energy cost savings and annual maintenance savings. The calculations in the example below are for an ECM that saves $850 annually in energy and maintenance costs (over a 10 year lifetime) and takes $5,000 to purchase and install after incentives:



ECM and Equipment Lifetimes

Determining a lifetime for equipment and ECM's can sometimes be difficult. The following table contains a list of lifetimes that the NJCEP uses in its commercial and industrial programs. Other valid sources are also used to determine lifetimes, such as the DOE, ASHRAE, or the manufacturer's warranty.

Lighting is typically the most difficult lifetime to calculate because the fixture, ballast, and bulb can all have different lifetimes. Essentially the ECM analysis will have different operating cost savings (avoided equipment replacement) depending on which lifetime is used.

When the bulb lifetime is used (rated burn hours/annual burn hours), the operating cost savings is just reflecting the theoretical cost of replacing the existing case bulb and ballast over the life of the recommended bulb. Dividing by the bulb lifetime will give an annual operating cost savings.

When a fixture lifetime is used (e.g. 15 years) the operating cost savings reflects the avoided bulb and ballast replacement cost of the existing case over 15 years minus the projected bulb and ballast replacement cost of the proposed case over 15 years. This will give the difference of the equipment replacement costs between the proposed and existing cases and when divided by 15 years will give the annual operating cost savings.

NJCEP C & I Lifetimes

Measure	Measure Life
Commercial Lighting — New	15
Commercial Lighting — Remodel/Replacement	15
Commercial Custom — New	18
Commercial Chiller Optimization	18
Commercial Unitary HVAC — New - Tier 1	15
Commercial Unitary HVAC — Replacement - Tier 1	15
Commercial Unitary HVAC — New - Tier 2	15
Commercial Unitary HVAC — Replacement Tier 2	15
Commercial Chillers — New	25
Commercial Chillers — Replacement	25
Commercial Small Motors (1-10 HP) — New or Replacement	20
Commercial Medium Motors (11-75 HP) — New or Replacement	20
Commercial Large Motors (76-200 HP) — New or Replacement	20
Commercial VSDs — New	15
Commercial VSDs — Retrofit	15
Commercial Comprehensive New Construction Design	18
Commercial Custom — Replacement	18
Industrial Lighting — New	15
Industrial Lighting — Remodel/Replacement	15
Industrial Unitary HVAC — New - Tier 1	15
Industrial Unitary HVAC — Replacement - Tier 1	15
Industrial Unitary HVAC — New - Tier 2	15
Industrial Unitary HVAC — Replacement Tier 2	15
Industrial Chillers — New	25
Industrial Chillers — Replacement	25
Industrial Small Motors (1-10 HP) — New or Replacement	20
Industrial Medium Motors (11-75 HP) — New or Replacement	20
Industrial Large Motors (76-200 HP) — New or Replacement	20
Industrial VSDs — New	15
Industrial VSDs — Retrofit	15
Industrial Custom — Non-Process	18
Industrial Custom — Process	10
Small Commercial Gas Furnace — New or Replacement	20
Small Commercial Gas Boiler — New or Replacement	20
Small Commercial Gas DHW — New or Replacement	10
C&I Gas Absorption Chiller — New or Replacement	25
C&I Gas Custom — New or Replacement (Engine Driven Chiller)	25
C&I Gas Custom — New or Replacement (Gas Efficiency Measures)	18
O&M savings	3
Compressed Air (GWh participant)	8

APPENDIX E: STATEMENT OF ENERGY PERFORMANCE FROM ENERGY STAR

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Borough of Freehold - Public Works Service Center

Building ID: 2211643
For 12-month Period Ending: November 30, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: April 14, 2010

Facility
Borough of Freehold - Public Works
Service Center
161 Center Street
Freehold, NJ 07728

Facility Owner
Borough of Freehold
51 West Main Street
Freehold, NJ 07728

Primary Contact for this Facility
Joseph Bellina
51 West Main Street
Freehold, NJ 07728

Year Built: 1999
Gross Floor Area (ft²): 16,000

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

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	238,816
Natural Gas (kBtu)[4]	721,301
Total Energy (kBtu)	960,117
Energy Intensity[5]	
Site (kBtu/ft²/yr)	60
Source (kBtu/ft²/yr)	97
Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	75
Electric Distribution Utility	
FirstEnergy - Jersey Central Power & Lt Co	
National Average Comparison	
National Average Site EUI	77
National Average Source EUI	150
% Difference from National Average Source EUI	-35%
Building Type	Service (Vehicle Repair/Service, Postal Service)

Stamp of Certifying Professional

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

Certifying Professional
N/A

Meets Industry Standards[6] **for Indoor Environmental Conditions:**	
Ventilation for Acceptable Indoor Air Quality	**N/A**
Acceptable Thermal Environmental Conditions	**N/A**
Adequate Illumination	**N/A**

Notes:
1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

EPA Form 5900-16

APPENDIX F: INCENTIVE PROGRAMS

New Jersey Clean Energy Pay for Performance

The NJ Clean Energy Pay for Performance (P4P) Program relies on a network of Partners who provide technical services to clients. LGEA participating clients who are not receiving Direct Energy Efficiency and Conservation Block Grants are eligible for P4P. SWA is an eligible Partner and can develop an Energy Reduction Plan for each project with a whole-building traditional energy audit, a financial plan for funding the energy measures and an installation construction schedule.

The Energy Reduction Plan must define a comprehensive package of measures capable of reducing a building's energy consumption by 15+%. P4P incentives are awarded upon the satisfactory completion of three program milestones: submittal of an Energy Reduction Plan prepared by an approved Program Partner, installation of the recommended measures and completion of a Post-Construction Benchmarking Report. Theincentives for electricity and natural gas savings will be paid based on actual savings, provided that the minimum 15%performance threshold savings has been achieved.

For further information, please see: http://www.njcleanenergy.com/commercial-industrial/programs/pay-performance/existing-buildings .

Direct Install 2010 Program

Direct Install is a division of the New Jersey Clean Energy Programs's Smart Start Buildings. It is a turn-key program for small to mid-sized facilities to aid in upgrading equipment to more efficient types. It is designed to cut overall energy costs by upgrading lighting, HVAC and other equipment with energy efficient alternatives. The program pays **up to 80%** of the retrofit costs, including equipment cost and installation costs.

Eligibility:

- Existing small and mid-sized commercial and industrial facilities with peak electrical demand **below 200 kW** within 12 months of applying
- Must be located in New Jersey
- Must be served by one of the state's public, regulated or natural gas companies
    - Electric: Atlantic City Electric, Jersey Central Power & Light, Orange Rockland Electric, PSE&G
    - Natural Gas: Elizabethtown Gas, New Jersey Natural Gas, PSE&G, South Jersey Gas

For the most up to date information on contractors in New Jersey who participate in this program, go to: http://www.njcleanenergy.com/commercial-industrial/programs/direct-install

Smart Start

New Jersey's SmartStart Building Program is administered by New Jersey's Office of Clean Energy. The program also offers design support for larger projects and technical assistance for smaller projects. If your project specifications do not fit into anything defined by the program, there are even incentives available for custom projects.

There are a number of improvement options for commercial, industrial, institutional, government, and agricultural projects throughout New Jersey. Alternatives are designed to enhance quality while building in energy efficiency to save money. Project categories included in this program are New

Construction and Additions, Renovations, Remodeling and Equipment Replacement.

For the most up to date information on how to participate in this program, go to: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings.

Renewable Energy Incentive Program

The *Renewable Energy Incentive Program (REIP)* provides incentives that reduce the upfront cost of installing renewable energy systems, including solar, wind, and sustainable biomass. Incentives vary depending upon technology, system size, and building type. Current incentive levels, participation information, and application forms can be found here.

Solar Renewable Energy Credits (SRECs) represent all the clean energy benefits of electricity generated from a solar energy system. SRECs can be sold or traded separately from the power, providing owners a source of revenue to help offset the cost of installation. All solar project owners in New Jersey with electric distribution grid-connected systems are eligible to generate SRECs. Each time a system generates 1,000 kWh of electricity an SREC is earned and placed in the customer's account on the web-based SREC tracking system.

For the most up to date information on how to participate in this program, go to: http://www.njcleanenergy.com/renewable-energy/home/home.

Utility Sponsored Programs

Check with your local utility companies for further opportunities that may be available.

Federal and State Sponsored Programs

Other federal and state sponsored funding opportunities may be available, including BLOCK and R&D grant funding. For more information, please check http://www.dsireusa.org/.

APPENDIX G: ENERGY CONSERVATION MEASURES

Energy Conservation Measures																			
ECM #	ECM description	Cost Source	Est. installed cost, $	Est. incentives, $	Net est. cost with incentives, $	kWh, 1st year savings	kW, demand reduction	therms, 1st year savings	kBtu/sq ft, 1st year savings	Est. operating cost, 1st year savings, $	Total 1st year savings, $	Life of measure, years	Est. lifetime energy cost savings, $	Simple payback, years	Lifetime return-on-investment, %	Annual return-on-investment, %	Internal rate of return, %	Net present value, $	CO_2 reduced, lbs/year
1	Install (1) VendingMiser device on non-refr. vending machine	Manufacturer	99	0	99	512	0.1	0	0.1	0	87	5	435	1.1	3	1	1	297	917
2	Install (2) new CFL lamps	RS Means	74	0	74	84	0.0	0	0.0	25	39	5	196	1.9	2	0	0	105	150
3	Install (1) VendingMiser device on refr. vending machine	Manufacturer	199	0	199	533	0.1	0	0.1	0	91	5	453	2.2	1	0	0	214	954
4	Install (8) Programmable Thermostats	RS Means	976	0	976	0	0.0	237	1.5	0	326	15	4,888	3.0	4	0	0	2,859	2,612
5	Install (4) new Occupancy Sensors	RS Means	880	80	800	1,414	0.3	0	0.3	0	240	15	3,606	3.3	4	0	0	2,029	2,532
6	Replace electric DHW with gas-fired unit	RS Means	2,872	200	2,672	4,825	0.8	-165	0.0	0	593	15	8,901	4.5	2	0	0	4,310	6,820
7	Replace (1) compact refrigerator with a 2.7 cu. ft. ENERGY STAR model	Manufacturer	396	0	396	380	0.0	0	0.1	0	65	12	775	6.1	1	0	0	239	680
8	Replace (1) garage refrigerator with a 17 cu. ft. ENERGY STAR model	Manufacturer	475	0	475	425	0.1	0	0.1	0	72	12	867	6.6	1	0	0	236	761
9	Install a 5 kW Solar Photovoltaic system	Similar Projects	35,000	5,000	30,000	5,900	5.0	0	1.3	0	4,003	25	100,075	7.5	2	0	0	22,384	10,564
10	Install (60) new T8 fluorescent fixtures	RS Means	6,968	900	6,068	2,921	0.6	0	0.6	252	749	15	11,229	8.1	1	0	0	2,740	5,230
11	Install (36) new pulse start metal halide fixtures	RS Means	15,705	900	14,805	9,363	2.0	0	2.0	87	1,679	15	25,181	8.8	1	0	0	4,948	16,764
	TOTALS		**63,644**	**7,080**	**56,564**	**26,357**	**9.0**	**72**	**6.1**	**364**	**7,944**	**-**	**156,606**	**7.1**	**-**	**-**	**-**	**40,361**	**47,986**

APPENDIX H: METHOD OF ANALYSIS

Assumptions and tools

Energy modeling tool:	Established/standard industry assumptions, eQUEST
Cost estimates:	RS Means 2009 (Facilities Maintenance & Repair Cost Data) RS Means 2009 (Building Construction Cost Data) RS Means 2009 (Mechanical Cost Data) Published and established specialized equipment material and labor costs Cost estimates also based on utility bill analysis and prior experience with similar projects

Disclaimer

This engineering audit was prepared using the most current and accurate fuel consumption data available for the site. The estimates that it projects are intended to help guide the owner toward best energy choices. The costs and savings are subject to fluctuations in weather, variations in quality of maintenance, changes in prices of fuel, materials, and labor, and other factors. Although we cannot guarantee savings or costs, we suggest that you use this report for economic analysis of the building and as a means to estimate future cash flow.

THE RECOMMENDATIONS PRESENTED IN THIS REPORT ARE BASED ON THE RESULTS OF ANALYSIS, INSPECTION, AND PERFORMANCE TESTING OF A SAMPLE OF COMPONENTS OF The DPW complex SITE. ALTHOUGH CODE-RELATED ISSUES MAY BE NOTED, SWA STAFF HAVE NOT COMPLETED A COMPREHENSIVE EVALUATION FOR CODE-COMPLIANCE OR HEALTH AND SAFETY ISSUES. THE OWNER(S) AND MANAGER(S) OF The DPW complex(S) CONTAINED IN THIS REPORT ARE REMINDED THAT ANY IMPROVEMENTS SUGGESTED IN THIS SCOPE OF WORK MUST BE PERFORMED IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS THAT APPLY TO SAID WORK. PARTICULAR ATTENTION MUST BE PAID TO ANY WORK WHICH INVOLVES HEATING AND AIR MOVEMENT SYSTEMS, AND ANY WORK WHICH WILL INVOLVE THE DISTURBANCE OF PRODUCTS CONTAINING MOLD, ASBESTOS, OR LEAD.