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Local Government Energy Program
Energy Audit Draft Report

Borough of Frenchtown

Police Department
27 2nd Street
Frenchtown, NJ 08825

Project Number: LGEA61

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EXECUTIVE SUMMARY

The Borough of Frenchtown Police Headquarters is a two-story former residential building with an attic and basement comprising a total conditioned floor area of 2,000 square feet. The original structure was built in 1870, and there have been numerous renovations since then. The following chart provides an overview of current energy usage in the building based on the analysis period of December 2008 through November 2009:

Table 1: State of Building—Energy Usage

	Electric Usage, kWh/yr	Gas Usage, therms/yr	#2 fuel oil usage, gal/yr	Current Annual Cost of Energy, $	Site Energy Use Intensity, kBtu/sq ft yr	Joint Energy Consumption, MMBtu/yr
Current	15,711	0	596	4,297	66.0	156
Proposed	5,726	-133	578	2,559	54.4	133
Savings	9,985	-133	18	1,738	11.6	23
% Savings	64%	N/A	3%	40%	18%	15%

There may be energy procurement opportunities for the Borough of Frenchtown to reduce annual utility costs, which are $939 higher, when compared to the average estimated NJ commercial utility rates.

SWA has entered energy information about the police department in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* energy benchmarking system. The plant is categorized as a non-eligible ("Other") space type. Because it is an "Other" space type, there is no rating available. Consequently, the department is not eligible to receive a national energy performance rating at this time. The Site Energy Use Intensity is 66.0 $\frac{kBtu}{ft^2-yr}$ compared to the national average of a police department consuming 78.0 $\frac{kBtu}{ft^2-yr}$. The building has a lower Site Energy Use Intensity since the Police Department is relatively small and is not operated 24 hours per day, compared to a typical Police Department. 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	First Year Savings ($)	Simple Payback Period (years)	Initial Investment, $	CO2 Savings, lbs/yr
0-5 Year	1,193	3.3	3,983	10,029
5-10 Year	546	6.1	3,345	6,582
Total	1,738	4.2	7,328	16,611

SWA estimates that implementing the recommended ECMs is equivalent to removing approximately 1 car from the roads each year or avoiding the need of 40 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:

- Install premium motors when replacements are required - Select NEMA Premium motors when replacing motors that have reached the end of their useful operating lives.

- Replace portions of damaged siding on the exterior wall

- Add insulation toward ineffectively and under-insulated roof sections. SWA suggests applying closed-cell spray-foam (R-30 min.) to the underside of the attic roof structure.

- Openings around window air-conditioning units need airtight gaskets/sealants for optimal all year performance. Insulated hoods should be installed during winter months if removing the units is not an option.

- Replace all original, single-glazed windows with a low-E, double glazed type.

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.

- Install/ repair and maintain roof flashing.

- Replace/repair and maintain damaged window units.

- Install/replace and maintain weather-stripping around all exterior doors and roof hatches.

- Maintain roofs - SWA recommends regular maintenance to verify the condition of the roof shingles and proper water drainage.

- Maintain exterior wall – SWA recommends regular maintenance to verify the condition of the siding and to identify signs of water damage and sources of infiltration.

- Maintain downspouts and cap flashing - Repair/install missing downspouts and cap flashing as needed to prevent water/moisture infiltration and insulation damage. SWA recommends round downspout elbows to minimize clogging.

- Provide weather-stripping/air-sealing - SWA observed that exterior door weather-stripping was beginning to deteriorate in places. Doors and vestibules should be observed annually for deficient weather-stripping and replaced as needed. The perimeter of all window frames should

also be regularly inspected, and any missing or deteriorated caulking should be re-caulked to provide an unbroken seal around the window frames. Any other accessible gaps or penetrations in the thermal envelope penetrations should also be sealed with caulk or spray foam.

- 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.

- SWA recommends that the building considers purchasing 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/.

Note: The recommended ECMs and the list above are cost-effective energy efficiency measures and building upgrades that will reduce operating expenses for Borough of Frenchtown. Based on the requirements of the LGEA program, the Borough of Frenchtown must commit to implementing some of these measures, and must submit paperwork to the Local Government Energy Audit program within one year of this report's approval to demonstrate that they have spent, net of other NJCEP incentives, at least 25% of the cost of the audit (per building). The minimum amount to be spent, net of other NJCEP incentives, is $1,251.

Financial Incentives and Other Program Opportunities

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

SWA recommends that the Borough of Frenchtown Police Department proceed to follow the list of 8 ECMs that have been recommended within the scope of work. At the time of this report, the Direct Install program through the New Jersey Office of Clean Energy provides the most relevant and best suited incentives for this building. Lighting installations as well as the installation of the programmable thermostat should be implemented immediately. SWA also recommends that the electric domestic hot water heater should be removed at the time of the next required service milestone and replaced with a natural gas-fired unit. In addition to the Energy Conservation Measures (ECMs), SWA also recommends that a routine, preventative maintenance plan is followed to ensure that the building operates efficiently. Routine maintenance will also extend the life of the building and avoid future maintenance costs. Work such as air-sealing and increasing attic insulation will have a slight impact on energy savings but will also improve comfort and durability of the building.

INTRODUCTION

Launched in 2008, the Local Government Energy Audit (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 Energy Services to administer the Program.

Steven Winter Associates, Inc. (SWA) is a 38-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 Police Department at 27 2nd Street. The process of the audit included facility visits on April 20th, 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 is to provide sufficient information to the Borough of Frenchtown to make decisions regarding the implementation of the most appropriate and most cost-effective energy conservation measures for the Police Department.

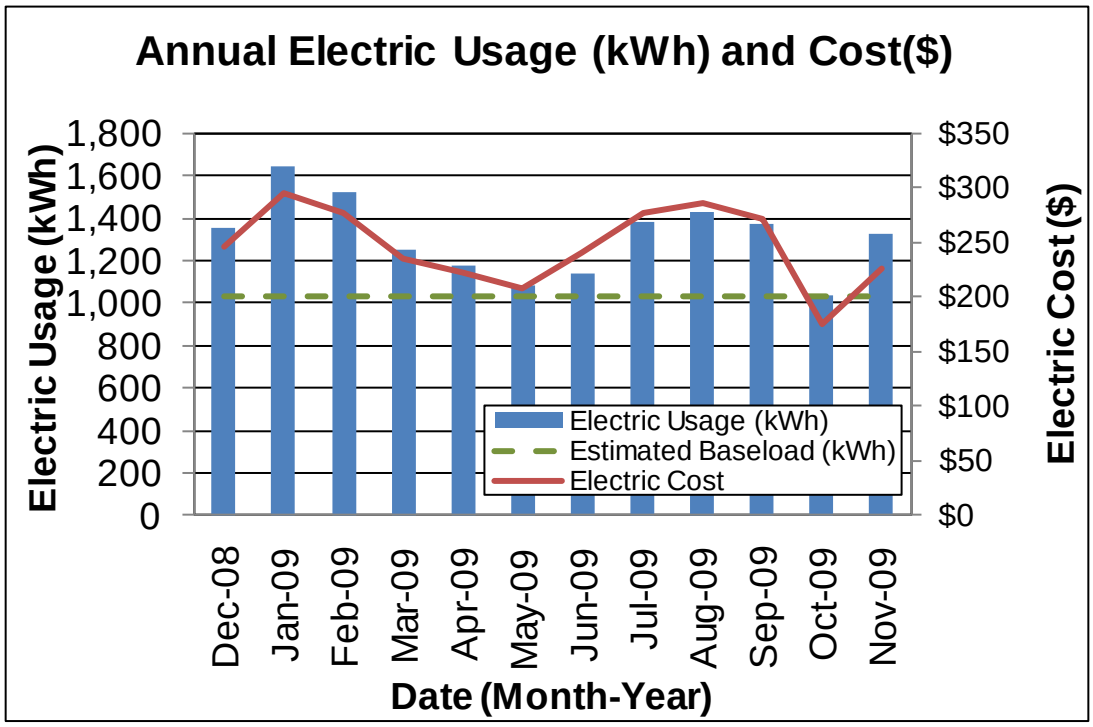
HISTORICAL ENERGY CONSUMPTION

Energy usage, load profile and cost analysis

SWA reviewed utility bills from March 2008 through January 2010 that were received from the utility companies supplying the Police Department with electricity and #2 fuel oil. A 12 month period of analysis from December 2008 through November 2009 was used for all calculations and for purposes of benchmarking the building.

Electricity - The Police Department is currently served by one electric meter. The Police Department currently buys electricity from JCP&L at **an average aggregated rate of $0.188/kWh**. The Police Department purchased **approximately 15,711 kWh, or $2,957 worth of electricity,** in the previous year.

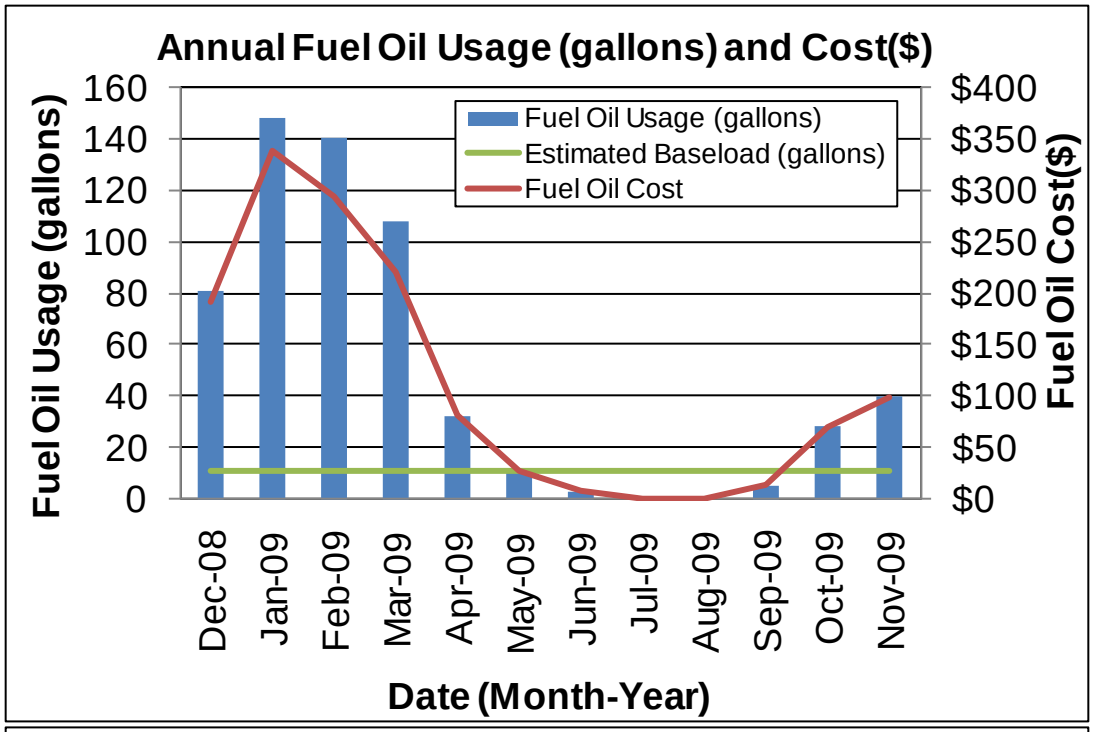
The chart below shows the monthly electric usage and costs. The dashed green line represents the approximate base load or minimum electric usage required to operate the Police Department.

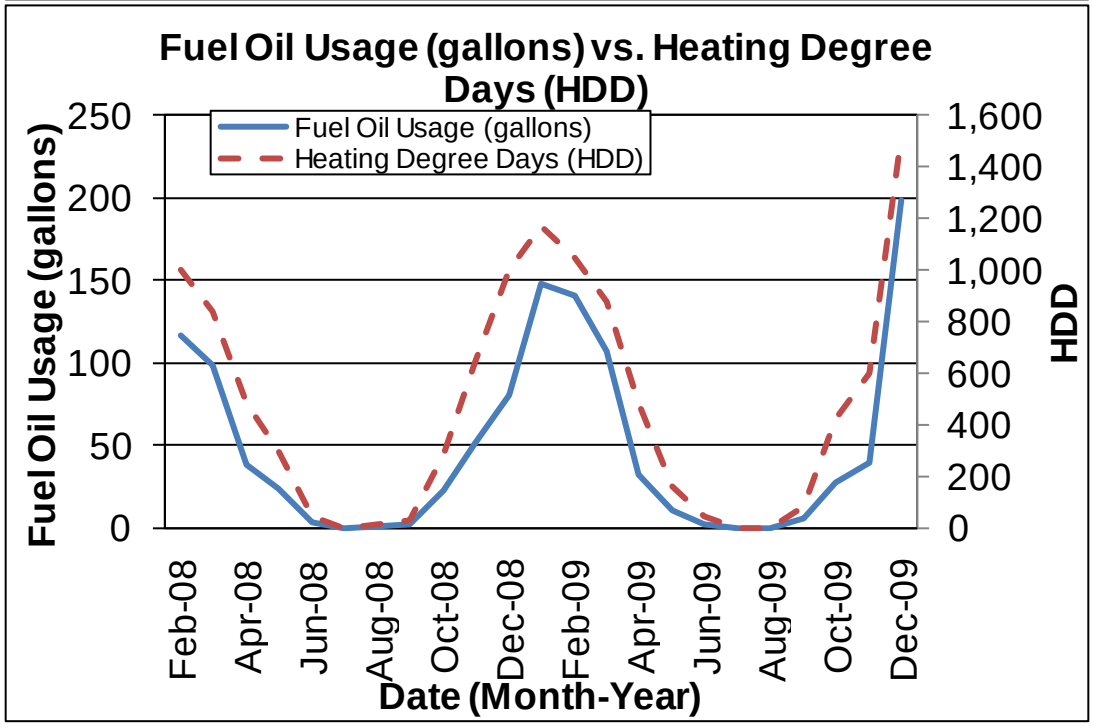


#2 Fuel Oil - The Police Department is currently served by one meter for #2 fuel oil. It currently buys oil from Stem Brothers Oil at **an average aggregated rate of $2.248/gallon**. The Police Department purchased **approximately 596 gallons, or $1,340 worth of oil,** in the previous year.

The chart below shows the monthly oil usage and costs. Due to the infrequent nature of the oil deliveries to the building, monthly usage was estimated in proportion to heating degree days.

The green line represents the approximate base load or minimum oil usage required to operate the Police Department.



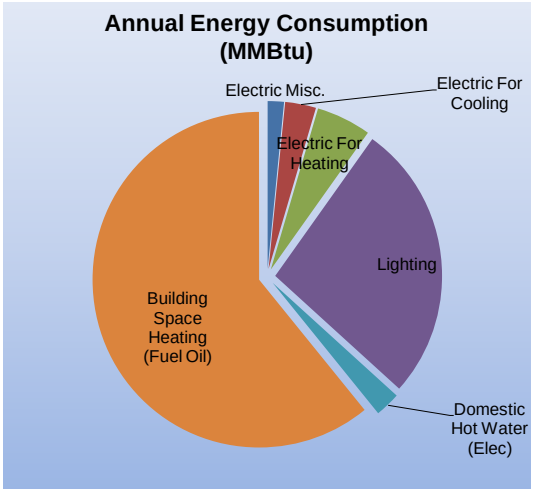


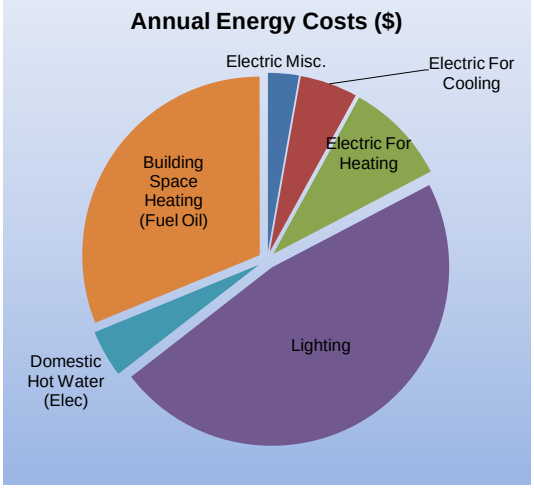
The chart above shows the monthly oil usage along with the heating degree days or HDD. Heating degree days is the difference of the average daily temperature and a base temperature,

on a particular day. The heating degree days are zero for the days when the average temperature exceeds the base temperature. SWA's analysis used a base temperature of 65 degrees Fahrenheit.

The following graphs, pie charts, and table show energy use for the Police Department based on utility bills for the 12 month period. Note: electrical cost at $55/MMBtu of energy is more than 3 times as expensive as oil at $16/MMBtu

December 2008 - November 2009 Annual Energy Consumption / Costs					
	MMBtu	% MMBtu	$	% $	$/MMBtu
Electric Miscellaneous	2	2%	$120	3%	55
Electric For Cooling	4	3%	$225	5%	55
Electric For Heating	7	5%	$401	9%	55
Lighting	37	27%	$2,026	47%	55
Domestic Hot Water (Elec)	3	2%	$184	4%	55
Building Space Heating (Fuel Oil)	83	61%	$1,340	31%	16
Totals	137	100%	$4,297	100%	
Total Electric Usage	54	39%	$2,957	69%	55
Total Fuel Oil Usage	83	61%	$1,340	31%	16
Totals	137	100%	$4,297	100%	

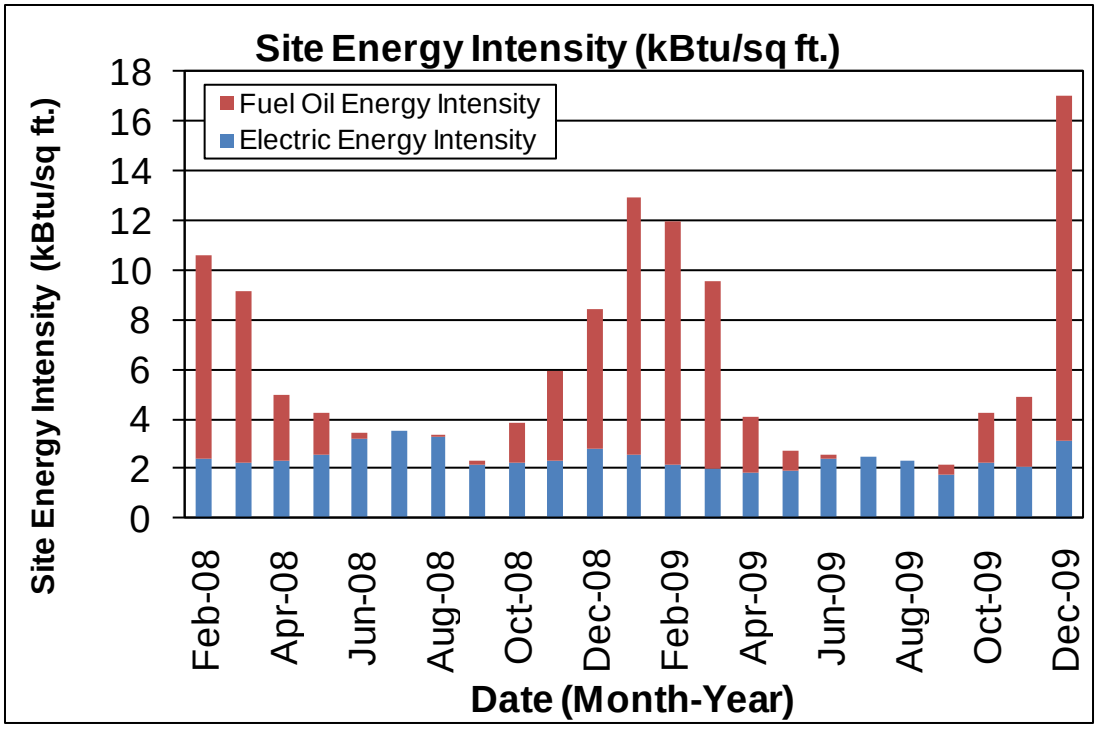




Energy benchmarking

SWA has entered energy information about the police department in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* energy benchmarking system. The plant is categorized as a non-eligible ("Other") space type. Because it is an "Other" space type, there is no rating available. Consequently, the department is not eligible to receive a national energy performance rating at this time. The Site Energy Use Intensity is 66.0 $\frac{kBtu}{ft^2-yr}$ compared to the national average of a Police Department consuming 78.0 $\frac{kBtu}{ft^2-yr}$. The building has a lower site energy use intensity compared to other Police Departments since it is a smaller Police Department that does not operate 24 hours per day. 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 Frenchtown to create an *ENERGY STAR® Portfolio Manager* account and share the Police Department facilities 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 "BOROUGHOFFRENCHTOWN" with a password of *"FRENCHTOWN")* and TRC Energy Services (user name of "TRC-LGEA").

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.

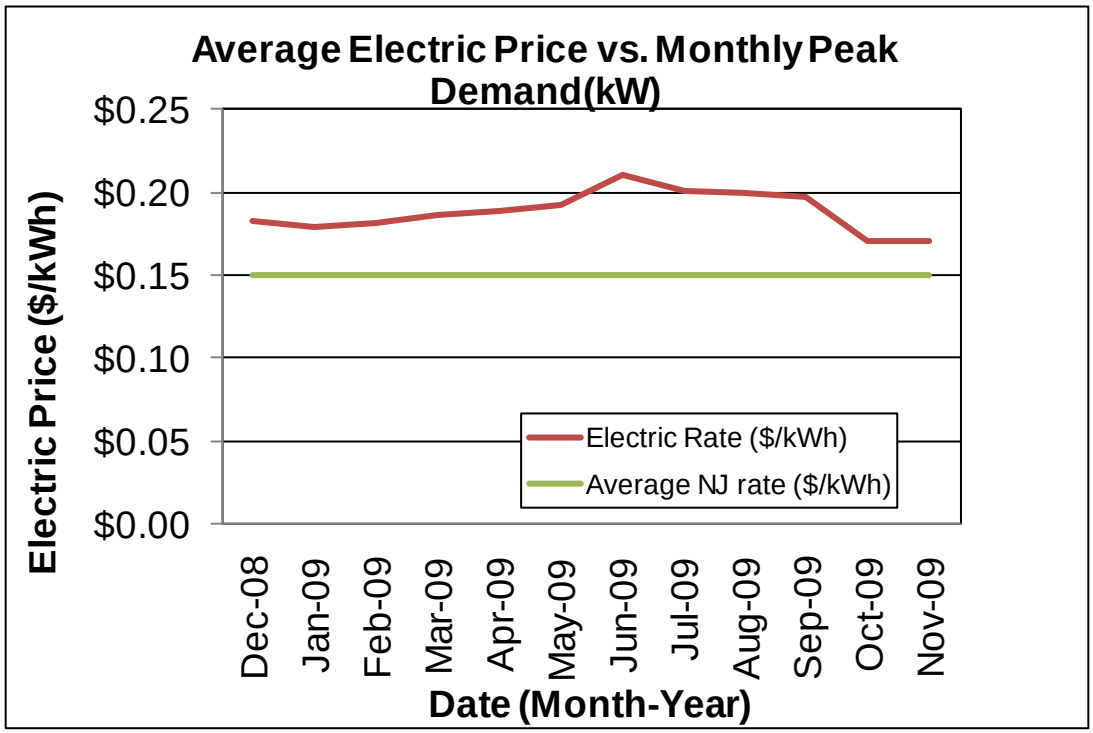
Tariff analysis is performed to determine if the rate that a municipality is contracted to pay with each utility provider is the best rate possible resulting in the lowest costs for electric and oil provisions. Typically, the oil prices increase during the heating months when oil is used by the furnace and electricity prices increase during the cooling months when electricity is used by the air conditioners.

The supplier charges a market-rate price based on use and market prices, 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 Frenchtown is paying a general service rate for oil. Demand is not broken out in the bill. 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.

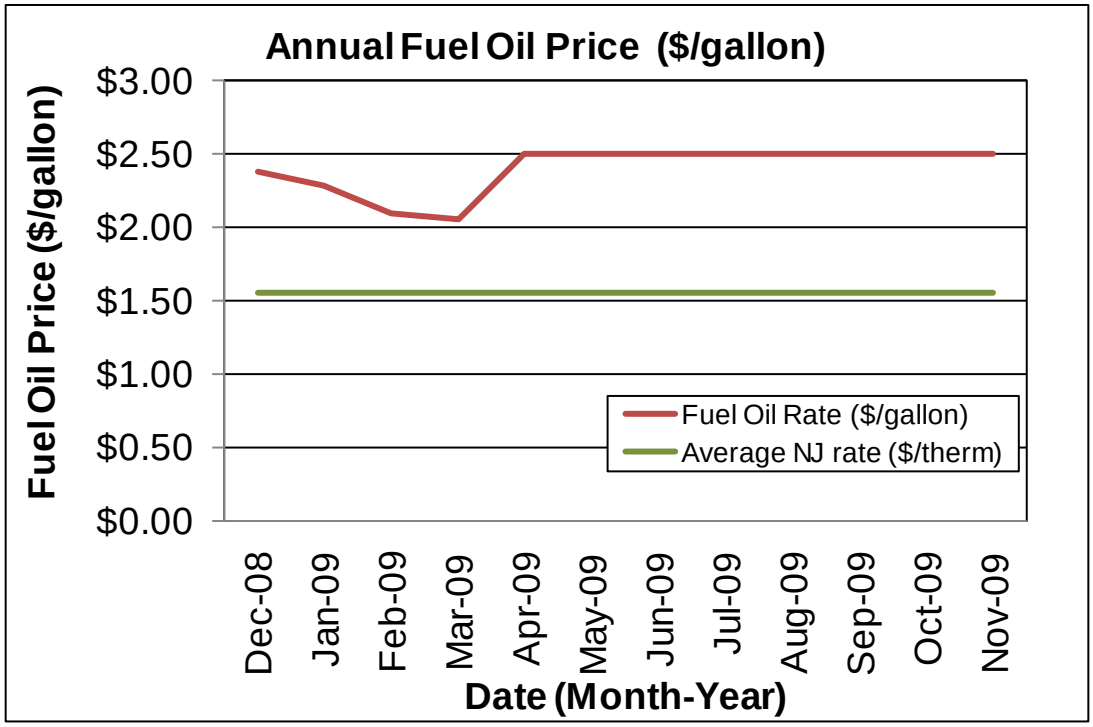
Energy Procurement strategies

Billing analysis is conducted using an average aggregated rate that is estimated based on the total cost divided by the total energy usage per utility per 12 month period. Average aggregated rates do not separate demand charges from usage, and instead provide a metric of inclusive cost per unit of energy. Average aggregated rates are used in order to equitably compare building utility rates to average utility rates throughout the state of New Jersey.

The average estimated NJ commercial utility rates for electric are $0.150/kWh, while the Police Department pays a rate of $0.188/kWh. The Police Department annual electric utility costs are $600 higher, when compared to the average estimated NJ commercial utility rates. Electric bill analysis shows fluctuations up to 19% over the most recent 12 month period.



The average estimated NJ commercial utility rates for oil are $1.680/gallon, while the Police Department pays a rate of $2.248/gallon. Oil bill analysis shows fluctuations up to 28% over the most recent 12 month period. The Police Department annual oil utility costs are $339 higher, when compared to the average estimated NJ commercial utility rates



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 Police Department further explore opportunities of purchasing both oil and electricity from third-party suppliers in order to reduce rate fluctuation and ultimately reduce the annual cost of energy for the Police Department. Appendix C contains a complete list of third-party energy suppliers for the Borough of Frenchtown 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 Tuesday, April 20, 2010, the following data was collected and analyzed.

Building Characteristics

The Police Department is a two-story slab below grade former residential building with an attic and basement comprising a total conditioned floor area of 2,000 square feet. The building was originally constructed in 1870 with numerous alterations throughout the years. It houses police offices, a locker room, kitchen, evidence room, and boiler room.

North Façade

South Façade

Partial East Façade


Partial West Façade

Building Occupancy Profiles

Its occupancy is approximately 4 employees daily from 7:00 AM to 1:00 AM the next morning as the building is used throughout the police officers 18 hours workday

Building Envelope

Due to unfavorable weather conditions (min. 18 deg. F delta-T in/outside and no/low wind); no exterior envelope infrared (IR) images were taken during the field audit.

General Note: All findings and recommendations on the exterior envelope (base, walls, roofs, doors and windows) are based on the energy auditors' experience and expertise, on construction document reviews (if available) and on detailed visual analysis, as far as accessibility and weather conditions allowed at the time of the field audit.

Exterior Walls

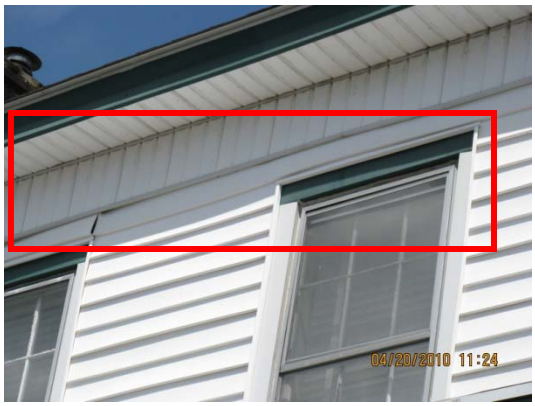
The exterior wall envelope is mostly constructed of vinyl siding over 3-1/2" framing with 1-1/2 inches of fiberglass batt cavity insulation. The interior is mostly painted gypsum wallboard.

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

Exterior and interior wall surfaces were inspected during the field audit. They were found to be in overall age-appropriate condition with only minor areas of concern.

The following specific exterior wall problem spots and areas were identified:

Damaged exterior wall surfaced and signs of water damage from missing flashing and damaged gutters.



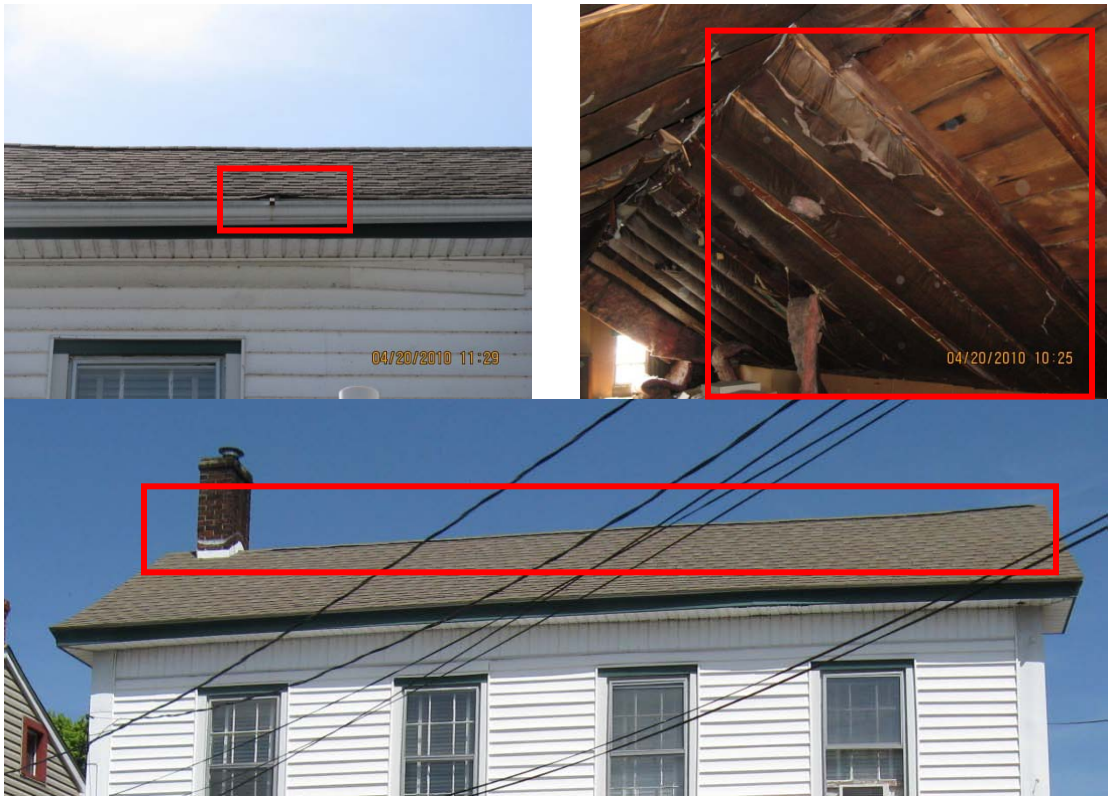
Displaced and damaged siding which can be a prime source of infiltration, and water damaged walls which are a sign of poor site drainage.

Roof

The building's roof is predominantly a medium-pitch gable type over a wood structure, with an asphalt shingle finish. It was installed recently. Three and a half inches of fiberglass batt attic/ceiling insulation, were recorded.

Roofs, related flashing, gutters and downspouts were inspected during the field audit. They were reported to be in overall good, age-appropriate condition, with only a few signs of uncontrolled moisture, air-leakage or other energy-compromising issues on any roof areas.

The following specific roof problem spots were identified:



Typical roof system with sections of missing or needing flashing, and signs of displaced shingles and sections of missing, or damaged and ineffective insulation.

Base

The building's base is composed of a below-grade basement with a slab floor and crawl space under the front porch with a perimeter footing with poured concrete foundation walls and no detectable slab edge/perimeter insulation.

Slab/perimeter insulation levels could not be verified in the field or on construction plans, and are based upon similar wall types and time of construction.

The building's base and its perimeter were inspected for signs of uncontrolled moisture or water presence and other energy-compromising issues. Overall the base was reported to be in good/ age appropriate condition with no signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues neither visible on the interior nor exterior.

Windows

The building contains basically five different types of windows:

1. Double-hung type windows with a wood frame, clear single glazing and interior roller blinds. The windows are located in the attic
2. Double-hung type windows with an insulated aluminum frame, clear double glazing and interior roller blinds. The windows are located on the second floor
3. Double-hung type windows with a wood frame, clear double glazing and interior roller blinds. The windows are located on the main floor. It was reported that most of those

windows have been rendered inoperable due to the dried paint in the frame of the units.

4. Hopper type windows with a non-insulated aluminum frame, clear single glazing and no interior or exterior shading devices. The windows are located basement.
5. Transom window units above the exterior doors.

Windows, shading devices, sills, related flashing and caulking were inspected as far as accessibility allowed for signs of moisture, air-leakage and other energy compromising issues. Overall, the windows were found to be in acceptable/ age appropriate condition with some signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues.

The following specific window problem spots were identified:

Air-leakage at sleeved window/wall air-conditioning units

Examples of damaged/aged window frame, and single-glazed window with ineffective frame

Exterior doors

The building contains three different types of exterior doors:

1. Two solid metal type exterior doors. They are located on the west and south facade.
2. One paneled solid metal type exterior door. It is located on the north facade.
3. One paneled solid metal type exterior door with glass panels located on the south façade.

All exterior doors, thresholds, related flashing, caulking and weather-stripping were inspected for signs of moisture, air-leakage and other energy-compromising issues. Overall, the doors were found to be in good condition with only a few signs of uncontrolled moisture, air-leakage and/ or other energy-compromising issues.

The following specific door problem spots were identified:

Typical Exterior Door Installations with some sections of damaged or missing weather-stripping

Building air-tightness

Overall the field auditors found the building to be reasonably air-tight, considering the building's use and occupancy, as described in more detail earlier in this chapter.

The air tightness of buildings helps maximize all other implemented energy measures and investments, and minimizes potentially costly long-term maintenance, repair and replacement expenses.

Mechanical Systems

Heating Ventilation Air Conditioning

It was reported by the occupants of the building that the Police Department heating system is prone to overheating in the winter, is hard to control accurately, and that the heated air supplied to the room is very dry. Recommendations to be discussed in greater detail in sections to follow such as programmable thermostats should help to rectify problems with overheating and controls. If the air quality issues remain in regards to humidity SWA would recommend installing humidifiers to service the affected areas. It was also reported that the air in the building becomes stale very easily which is probably a result of a lack of fresh air and reduced ventilation due to the first floor windows remaining closed.

Equipment

The Police Department is cooled by three window air conditioners and heated by a forced air oil fired furnace. Ventilation equipment is located in the bathrooms and hot water is provided by an electric hot water heater. A comprehensive Equipment List can be found in Appendix A.

All three window air conditioners are residential units with remote controls and digital thermostats. All three units are located to service offices on the first floor or locker rooms on the third floor. They are sized at either 8,000 or 10,000 BTU/Hr. and all have an EER of 9.8. They are all in good working order, use R-22 refrigerant and draw air from a source with little to no risk of contamination.

Typical through the window air conditioner found in both offices on the first floor

The entire building is heated by an oil fired forced air furnace located in the basement. Manufactured by Armstrong the unit has an AFUE of 81%. The furnace is controlled by a manual thermostat. It supplies air to the different rooms through diffusers. It is in good working condition and based on the reports of overheating during the winter it is more than capable of meeting the buildings heating load. Combustible items are being stored in close proximity to heating equipment in the basement. It is advisable that these items should be removed from the basement or moved as far away from the furnace as possible.

Armstrong Oil Fired Furnace and Oil Storage Tank

The various spaces of the building are naturally ventilated. There are two 50 CFM exhaust fans located on the roof, which serve the bathrooms. In general, the building exhaust fans were found to be in good mechanical condition but the vents were observed to be dirty and clogged and a potential IAQ problem as well as reducing the effectiveness of the fans.

Typical toilet exhaust fan with clogged dusty vents

Distribution Systems

Conditioned air is distributed through a network of ducts and diffusers. They are embedded into the floors and walls of the building, but most diffusers are found in the walls near ceiling height. Hot water is distributed by insulated copper piping.

Examples of typical diffuser and distribution system in the basement

Domestic Hot Water

The domestic hot water (DHW) for the Police Department is provided by an electric heated Westinghouse with approximately 40 gallon storage capacity and electric coil heating element. This heater has 65% estimated useful operating life remaining and appears in good condition.


Domestic Hot Water Heater

Electrical Systems

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 Police Department currently contains mostly inefficient T12 fixtures, and incandescent fixtures. Based on measurements of lighting levels for each space, there are no vastly over-illuminated areas. All lighting is controlled by manual switches.

Typical Ceiling Mounted Fixture with T12 Magnetically Ballasted Bulbs

Exit Lights - Exit signs were found to be LED and fluorescent type. SWA recommends that the fluorescent exit signs should be replaced with LED exit signs.

Exterior Lighting - The exterior lighting surveyed during the building audit was found to be a mix of incandescent and halogen fixtures. Exterior lighting is controlled by automatic timers.

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.

Two older model inefficient refrigerators are installed at the police department. One of the units is a large GE unit while the other unit is a compact refrigerator. SWA recommends that both of them should be replaced with ENERGY STAR® labeled units. See ECM # 5 for more details.

Elevators

The Police Department does not have an installed elevator.

Other electrical systems

There are not currently any other significant energy-impacting electrical systems or process equipment installed at the Police Department.

RENEWABLE AND DISTRIBUTED ENERGY MEASURES

Renewable energy is defined as any power source generated from sources which are naturally replenished, such as sunlight, wind and geothermal. Technology for renewable energy is improving, and the cost of installation is decreasing, due to both demand and the availability of state and federal government-sponsored funding. Renewable energy reduces the need for using either electricity or fossil fuel, therefore lowering costs by reducing the amount of energy purchased from the utility company. Technology such as photovoltaic panels or wind turbines, use natural resources to generate electricity on the site. Geothermal systems offset the thermal loads in a building by using water stored in the ground as either a heat sink or heat source. Solar thermal collectors heat a specified volume of water, reducing the amount of energy required to heat water using building equipment. Cogeneration or CHP allows you to generate electricity locally, while also taking advantage of heat wasted during the generation process.

Existing systems

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

Evaluated Systems

Solar Photovoltaic

Photovoltaic panels convert light energy received from the sun into a usable form of electricity. Panels can be connected into arrays and mounted directly onto building roofs, as well as installed onto built canopies over areas such as parking lots, building roofs or other open areas. Electricity generated from photovoltaic panels is generally sold back to the utility company through a net meter. Net-metering allows the utility to record the amount of electricity generated in order to pay credits to the consumer that can offset usage and demand costs on the electric bill. In addition to generation credits, there are incentives available called Solar Renewable Energy Credits (SRECs) that are subsidized by the state government. Specifically, the New Jersey State government pays a market-rate SREC to

facilities that generate electricity in an effort to meet state-wide renewable energy requirements.

Based on utility analysis and a study of roof conditions, the Police Department is not a good candidate for a 5 kW Solar Panel installation. Portions of the roof are sloped in an east-west direction and are subject to large amounts of shading from its surrounding environment. Additionally there is also expected shading on the sloped in a north-south direction roof from nearby buildings and a minimal amount of optimally sloped south facing roof area. Accordingly there is insufficient roof space for panels to reasonably supplement the power consumption of the building.

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 Police Department 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 65% and 86% remaining useful life.

Combined Heat and Power

The Police Department 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 base load 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 Highly Recommended 0-5 Year Payback ECMs
1	Install (18) eighteen new CFL fixtures to be installed with incentives
2	Install (1) new thermostat
3	Install five (5) new occupancy sensors to be installed with incentives
4	Install two (2) new LED exit sign fixtures to be installed with incentives
5	Install eleven (11) new T8 fixtures to be installed with incentives
	Description of Recommended 5-10 Year Payback ECMs
6	Install one (1) large new ENERGY STAR® refrigerator
7	Replace electric DHW heater with gas-fired unit
8	Replace (1) kitchen compact refrigerator with 2.7 cu. Ft. ENERGY STAR models

Assumptions: Discount Rate: 3.2%; Energy Price Escalation Rate: 0%
Note: A 0.0 electrical demand reduction/month indicates that it is very low/negligible

ECM#1: Install (18) new CFL fixtures

On the day of the site visit, SWA completed a lighting inventory of the Borough of Frenchtown Police Department (see Appendix B). The existing lighting inventory contained 18 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: $825 (includes $360 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
1	825	2,065	0.4	0	3.5	80	468	5	2,339	1.8	184	37	49	1,305	3,697

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:

- *None*

Please see Appendix F for more information on Incentive Programs.

ECM#2: *Install (1) Programmable Thermostat*

On the day of the site visit, SWA observed that the oil fired furnace located in the basement is controlled with a non-programmable thermostat. SWA recommends retro-fitting the furnace with a programmable thermostat that can reduce setpoint temperatures at night when the Police Department 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 to a reasonable temperature such as 70ºF.

Installation cost:

Estimated installed cost: $122 (includes $30 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	Gallons of oil, 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	122	0	0.0	18	1.3	0	40	15	603	3.0	394%	26%	32	351	197

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#3: *Install (5) new Occupancy Sensors*

On the day of the site visit, SWA observed that the Borough of Frenchtown Police Department did not contain any lighting that was operated via occupancy sensors. SWA identified three locations, the patrol office, chiefs office and vestibule, within the Borough of Frenchtown Police Department that could benefit from the installation of a total of five occupancy sensors. Please see Appendix B for a detailed lighting inventory.

Installation cost:

Estimated installed cost: $1000 (includes $150 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
3	1,000	1,311	0.3	0	2.2	0	246	15	3,696	4.1	270%	18%	24	1,900	2,347

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 – Smart Start – Wall-mounted occupancy sensors ($20 per sensor).*

Please see Appendix F for more information on Incentive Programs.

ECM#4: *Install (2) new LED exit sign*

On the day of the site visit, SWA completed a lighting inventory of the Borough of Frenchtown Police Department (see Appendix B). The existing lighting inventory contained 2 inefficient fluorescent exit signs. SWA recommends that these exit signs be replaced with a new, more efficient LED exit sign. LED exit signs can provide significant energy savings since they operate 24 hours per day.

Installation cost:

Estimated installed cost: $261 (includes $40 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
4	261	289	0.1	0	0.5	6	60	15	902	4.3	246%	16%	22	447	518

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 – Smart Start – LED Exit Signs ($20 per fixture)*

Please see Appendix F for more information on Incentive Programs.

ECM#5: *Install (11) new T8 Fluorescent Fixtures*

On the day of the site visit, SWA completed a lighting inventory of the Borough of Frenchtown Police Department (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: $1,776 (includes $330 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
5	1,776	1,826	0.4	0	3.1	35	378	15	5,674	4.7	220	15	20	2,676	3,269

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 – Smart Start – T8 fixtures with electronic ballasts ($15 per fixture)*

Please see Appendix F for more information on Incentive Programs.

ECM#6: ***Replace (1) large kitchen 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 ENERGY STAR® refrigerator. 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
6	475	425	0.1	0	0.7	0	80	12	959	5.9	102	8	13	311	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#7: *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, 40 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. 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	Gallons of oil, 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	2,672	3,910	0.8	-133	0.0	0	436	15	6,539	6.1	145	10	14	2,458	5,535

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 70 MBH, gas-fired DHW heater.

Rebates/financial incentives:

- *NJ Clean Energy – Smart Start – Gas Water Heaters <50 gallons ($50 per unit)*

Please see Appendix F for more information on Incentive Programs.

ECM#8: *Replace (1) kitchen compact refrigerator with 2.7 cu. Ft. ENERGY STAR models*

On the day of the site visit, SWA observed that there were two old refrigerators, one of the units is a 2.7 cu. ft. model that is 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 unit located in the kitchen 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: $198 (Includes $15 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	198	160	0.0	0	0.3	0	30	12	361	6.6	82	7	11	98	286

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.

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 Police Department:

- Install premium motors when replacements are required - Select NEMA Premium motors when replacing motors that have reached the end of their useful operating lives.
- Replace portions of damaged siding on the exterior wall
- Add insulation to ineffectively and under-insulated roof sections. SWA suggests applying closed-cell spray-foam (R-30 min.) to the underside of the attic roof structure.
- Openings around window air-conditioning units need airtight gaskets/sealants for optimal all year performance. Insulated hoods should be installed during winter months if removing the units is not an option.
- Replace all original, single-glazed windows with a low-E, double glazed type.

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.

- Install/ repair and maintain roof flashing.
- Replace/repair and maintain damaged window units.
- Install/replace and maintain weather-stripping around all exterior doors and roof hatches.
- Maintain roofs - SWA recommends regular maintenance to verify the condition of the roof shingles and proper water drainage.
- Maintain exterior wall – SWA recommends regular maintenance to verify the condition of the siding and to identify signs of water damage and sources of infiltration.
- Maintain downspouts and cap flashing - Repair/install missing downspouts and cap flashing as needed to prevent water/moisture infiltration and insulation damage. SWA recommends round downspout elbows to minimize clogging.

- Provide weather-stripping/air-sealing - SWA observed that exterior door weather-stripping was beginning to deteriorate in places. Doors and vestibules should be observed annually for deficient weather-stripping and replaced as needed. The perimeter of all window frames should also be regularly inspected, and any missing or deteriorated caulking should be re-caulked to provide an unbroken seal around the window frames. Any other accessible gaps or penetrations in the thermal envelope penetrations should also be sealed with caulk or spray foam.

- 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.

- SWA recommends that the building considers purchasing 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/.

Note: The recommended ECMs and the list above are cost-effective energy efficiency measures and building upgrades that will reduce operating expenses for Borough of Frenchtown. Based on the requirements of the LGEA program, the Borough of Frenchtown must commit to implementing some of these measures, and must submit paperwork to the Local Government Energy Audit program within one year of this report's approval to demonstrate that they have spent, net of other NJCEP incentives, at least 25% of the cost of the audit (per building). The minimum amount to be spent, net of other NJCEP incentives, is $1,251.

APPENDIX A: EQUIPMENT LIST

Inventory

Building System	Description	Physical Location	Make/ Model	Fuel	Space served	Date Installed	Estimated Remaining useful life %
Cooling	AC-1, Maytag through the window A/C, 8,000 BTU/Hr., 9.8 EER, 2 Fan Speeds, Remote Control and Digital Thermostat, 115 Volt, 9.8 Amps, 815 Watts cooling, 125/15 Plug Cap. Amps, R-22	3rd Floor Locker Room	Maytag, Model # M6X08F2A-B, Serial # KP 123607 291Y	Electric	3rd Floor Locker Room	2005	66%
Cooling	AC-2, LG through the window A/C, 10,000 BTU/Hr., 9.8 EER, 3 Fan Speeds, Remote Control and Digital Thermostat, 115 Volt, 9.2 Amps, 1020 Watts cooling, R-22	1st Floor Office near kitchen	LG, Model # LWHD1009R, Serial # 904TAEJA3908	Electric	1st Floor Office near kitchen	2008	86%
Cooling	AC-3, LG through the window A/C, 10,000 BTU/Hr., 9.8 EER, 3 Fan Speeds, Remote Control and Digital Thermostat, 115 Volt, 9.2 Amps, 1020 Watts cooling, R-22	1st Floor Office near kitchen	LG, Model # LWHD1009R, Serial # 904TAEJA3908	Electric	1st Floor Office near kitchen	2008	86%
Heating	Armstrong Furnace, 81% AFUE, Manual Thermostat, Upflow, Forced Air, Backdraft Damper	Basement Boiler Room	Armstrong	#2 Fuel Oil	Entire Building	2003	65%
Hot Water Heater	HW-1; Westinghouse Electric Water Heater With Approx. 40 gal. Storage Capacity	Basement Boiler Room	Westinghouse	Electricity	Entire Building	2000	65%
Ventilation	Toilet Exhaust Fan, 50 CFM @ 0.10" W.C., 2.5 Sones	1st Floor Bathroom Near Kitchen	HVI, Model # C-K3289	Electricity	1st Floor Bathroom Near Kitchen	~2000	33%
Ventilation	Toilet Exhaust Fan, 50 CFM @ 0.10" W.C., 2.5 Sones	1st Floor Bathroom In Entrance Vestibule	HVI, Model # C-K3289	Electricity	1st Floor Bathroom In Entrance Vestibule	~2000	33%
Lighting	See Appendix B	-	-	-	-	-	-

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	3	Locker Room	Ceiling Mounted	S	Inc	1	2	60	Sw	4	365	0	120	175	CFL	Ceiling Mounted	CFL	S	Sw	1	2	20	4	365	0	40	58	117	0	117
2	3	Sgt. Office	Ceiling Mounted	S	Inc	1	2	60	Sw	8	365	0	120	350	CFL	Ceiling Mounted	CFL	S	Sw	1	2	20	8	365	0	40	117	234	0	234
3	Attic	Storage Room	Ceiling Mounted	S	Inc	1	1	60	Sw	2	365	0	60	44	CFL	Ceiling Mounted	CFL	S	Sw	1	1	20	2	365	0	20	15	29	0	29
4	3	Storage Room	Ceiling Mounted	S	Inc	1	1	60	Sw	2	365	0	60	44	CFL	Ceiling Mounted	CFL	S	Sw	1	1	20	2	365	0	20	15	29	0	29
5	2	Storage Room	Exit Sign	S	Fl.	1	1	5	N	24	365	1	6	48	LEDex	Exit Sign	LED	S	N	1	1	5	24	365	1	6	48	0	0	0
6	2	Storage Room	Ceiling Mounted	M	4'T12	1	4	40	Sw	2	365	12	172	126	T8	Ceiling Mounted	4'T8	E	Sw	1	4	32	2	365	5	133	97	28	0	28
7	2	Bathroom	Ceiling Mounted	M	2'T12	1	1	20	Sw	4	365	6	26	38	T8	Ceiling Mounted	2'T8	E	Sw	1	1	17	4	365	2	19	28	10	0	10
8	1	Office	Ceiling Mounted	M	4'T12	1	4	40	Sw	8	365	12	172	502	T8	Ceiling Mounted	4'T8	E	Sw	1	4	32	8	365	5	133	388	114	0	114
9	1	Kitchen	Ceiling Mounted	M	Circline - T12	1	1	40	Sw	4	365	12	52	76	N/A	Ceiling Mounted	rcline -	M	Sw	1	1	40	4	365	6	46	68	8	0	8
10	1	Radio Room	Ceiling Mounted	M	4'T12	1	4	40	Sw	8	365	12	172	502	T8	Ceiling Mounted	4'T8	E	Sw	1	4	32	8	365	5	133	388	114	0	114
11	1	Vestibule	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	Vestibule	Ceiling Mounted	S	Inc	1	1	60	Sw	2	365	0	60	44	CFL	Ceiling Mounted	CFL	S	Sw	1	1	20	2	365	0	20	15	29	0	29
13	1	Bathroom	Vanity	S	Inc	1	4	60	Sw	4	365	0	240	350	CFL	Vanity	CFL	S	Sw	1	4	20	4	365	0	80	117	234	0	234
14	1	Bathroom	Ceiling Mounted	S	Inc	1	1	60	Sw	4	365	0	60	88	CFL	Ceiling Mounted	CFL	S	Sw	1	1	20	4	365	0	20	29	58	0	58
15	1	Patrol Office	Ceiling Mounted	M	4'T12	3	4	40	Sw	18	365	12	516	3,390	T8	Ceiling Mounted	4'T8	E	OS	3	4	32	14	365	5	399	1966	769	655	1424
16	1	Patrol Office	Exit Sign	E	Fl.	1	1	15	N	24	365	2	17	145	LEDex	Exit Sign	LED	E	N	1	1	5	24	365	1	6	48	96	0	96
17	1	Chiefs Office	Ceiling Mounted	M	4'T12	2	4	40	Sw	18	365	12	344	2,260	T8	Ceiling Mounted	4'T8	E	OS	2	4	32	14	365	5	266	1311	512	437	949
18	1	Vestibule	Exit Sign	S	LED	1	1	5	Sw	24	365	1	6	48	N/A	Exit Sign	LED	S	Sw	1	1	5	24	365	1	6	48	0	0	0
19	1	Vestibule	Ceiling Mounted	M	4'T12	1	4	40	Sw	18	365	12	172	1,130	T8	Ceiling Mounted	4'T8	E	OS	1	4	32	14	365	5	133	655	256	218	475
20	1	Bathroom	Vanity	S	Inc	1	4	60	Sw	4	365	0	240	350	CFL	Vanity	CFL	S	Sw	1	4	20	4	365	0	80	117	234	0	234
21	1	Bathroom	Ceiling Mounted	S	Inc	1	1	60	Sw	4	365	0	60	88	CFL	Ceiling Mounted	CFL	S	Sw	1	1	20	4	365	0	20	29	58	0	58
22	Bsmt	Staircase	Wall Mounted	S	Inc	1	1	60	Sw	2	365	0	60	44	CFL	Wall Mounted	CFL	S	Sw	1	1	20	2	365	0	20	15	29	0	29
23	Bsmt	Boiler Rm	Ceiling Mounted	S	Inc	2	1	60	Sw	2	365	0	120	88	CFL	Ceiling Mounted	CFL	S	Sw	2	1	20	2	365	0	40	29	58	0	58
24	Ext	Exterior	Wall Mounted	S	Inc	2	1	60	T	12	365	0	120	526	CFL	Wall Mounted	CFL	S	T	2	1	20	12	365	0	40	175	350	0	350
25	Ext	Exterior	Ceiling Mounted	S	Inc	1	1	60	T	12	365	0	60	263	CFL	Ceiling Mounted	CFL	S	T	1	1	20	12	365	0	20	88	175	0	175
26	Ext	Exterior	Wall Mounted	S	Hal	3	1	35	T	12	365	8	128	561	CFL	Wall Mounted	CFL	S	T	3	1	10	12	365	0	30	131	430	0	430
Totals:						33	52	1,145				101	3,167	11,327						33	52	539			40	1,774	6,043	3,973	1,311	5,284
Rows Highlighed Yellow Indicate an Energy Conservation Measure is recommended for that space																													

Proposed Lighting Summary Table			
Total Gross Floor Area (SF)	2,000		
Average Power Cost ($/kWh)	0.1880		
Exterior Lighting	**Existing**	**Proposed**	**Savings**
Exterior Annual Consumption (kWh)	1,349	394	**955**
Exterior Power (watts)	308	90	**218**
Total Interior Lighting	**Existing**	**Proposed**	**Savings**
Annual Consumption (kWh)	9,978	5,649	**4,329**
Lighting Power (watts)	2,859	1,684	**1,175**
Lighting Power Density (watts/SF)	1.43	0.84	**0.59**
Estimated Cost of Fixture Replacement ($)	2,577		
Estimated Cost of Controls Improvements ($)	1,000		
Total Consumption Cost Savings ($)	**1,749**		

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 New Energy, 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

APPENDIX D: GLOSSARY AND METHOD OF CALCULATIONS

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.

Gas Rate and Electric Rate ($/therm and $/kWh): The gas rate and electric rate used in the financial analysis is the total annual energy cost divided by the total annual energy usage for the 12 month billing period studied. The graphs of the monthly gas and electric rates reflect the total monthly energy costs divided by the monthly usage, and display how the average rate fluctuates throughout the year. The average annual rate is the only rate used in energy savings calculations.

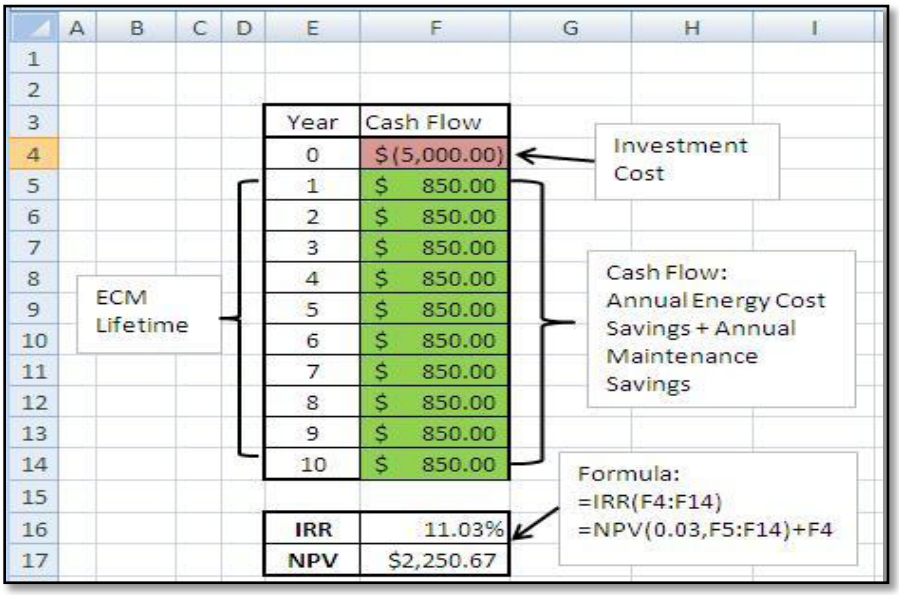
Calculation References

Term	Definition
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
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)]

* 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).

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:



Solar PV ECM Calculation

There are several components to the calculation:

Costs:	Material of PV system including panels, mounting and net-metering + Labor
Energy Savings:	Reduction of kWh electric cost for life of panel, 25 years
Incentive 1:	NJ Renewable Energy Incentive Program (REIP), for systems of size 50kW or less, $1/Watt incentive subtracted from installation cost
Incentive 2:	Solar Renewable Energy Credits (SRECs) – Market-rate incentive. Calculations assume $600/Megawatt hour consumed per year for a maximum of 15 years; added to annual energy cost savings for a period of 15 years. (Megawatt hour used is rounded to nearest 1,000 kWh)
Assumptions:	A Solar Pathfinder device is used to analyze site shading for the building and determine maximum amount of full load operation based on available sunlight. When the Solar Pathfinder device is not implemented, amount of full load operation based on available sunlight is assumed to be 1,180 hours in New Jersey.

Total lifetime PV energy cost savings =
kWh produced by panel * [$/kWh cost * 25 years + $600/Megawatt hour /1000 * 15 years]

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.

New Jersey Clean Energy Program Commercial & Industrial Lifetimes

Measure	Life Span
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 Frenchtown - Police Department

Building ID: 2287287
For 12-month Period Ending: November 30, 2009[1]
Date SEP becomes ineligible: N/A
Date SEP Generated: April 29, 2010

Facility	**Facility Owner**	**Primary Contact for this Facility**
Borough of Frenchtown - Police Department 2nd Street Frenchtown, NY 08825	Borough of Frenchtown 29 2nd Street Frenchtown, NJ 08825	Bryan Davison 29 2nd Street Frenchtown, NJ 08825

Year Built: 1870
Gross Floor Area (ft²): 2,000

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

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	53,606
Fuel Oil (No. 2) (kBtu)	79,321
Natural Gas - (kBtu)[4]	0
Total Energy (kBtu)	132,927
Energy Intensity[5]	
Site (kBtu/ft²/yr)	66
Source (kBtu/ft²/yr)	130
Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	14
Electric Distribution Utility	
FirstEnergy - Jersey Central Power & Lt Co	
National Average Comparison	
National Average Site EUI	78
National Average Source EUI	157
% Difference from National Average Source EUI	-17%
Building Type	Fire Station/Police Station

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. The incentives 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' 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 Smart Start 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 at the website listed below.

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.

Energy Efficiency and Conservation Block Grant Rebate Program

The Energy Efficiency and Conservation Block Grant (EECBG) Rebate Program provides supplemental funding up to $20,000 for eligible New Jersey local government entities to lower the cost of installing energy conservation measures. Funding for the EECBG Rebate Program is provided through the American Recovery and Reinvestment Act (ARRA).

For the most up to date information on how to participate in this program, go to: http://njcleanenergy.com/EECBG

Other 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

	ECM #	ECM description	est. incentives, $	net est. ECM cost with incentives, $	kWh, 1st yr savings	kW, demand reduction/mo	Gallons of oil, 1st yr savings	therms, 1st yr savings	kBtu/sq ft, 1st yr savings	est. operating cost, 1st yr savings, $	total 1st yr savings, $	life of measure, yrs	est. lifetime cost savings, $	simple payback, yrs	lifetime return on investment, %	annual return on investment, %	internal rate of return, %	net present value, $
0-5 Year Payback	1	**Install eighteen (18) New CFL fixtures to be installed with incentives**	none at this time	825	2,065	0.4	0	0	3.5	80	468	5	2,339	1.8	184	3,672	49	1,305
	2	**Install (1) new Thermostat**	0	122	0	0	18	0	0	0	40	15	603	3.1	394	2,628	32	349
	3	**Five (5) New occupancy sensors to be installed with incentives**	100	1,000	1,311	0.3	0	0	2.2	0	246	15	3,696	4.1	270	1,797	24	1,900
	4	**Two (2) New LED exit sign fixtures to be installed with incentives**	40	261	289	0.1	0	0	0.5	6	60	10	601	4.3	130	1,304	22	447
	5	**Eleven (11) New T8 fixtures to be installed with incentives**	165	1,776	1,826	0.4	0	0	3.1	35	378	15	5,674	4.7	220	1,464	20	2,676
Year	6	**Install One (1) Larger New ENERGY STAR® Refrigerator**	0	475	425	0.1	0	0	0.7	0	80	12	959	5.9	102	849	13	311

	7	**Replace electric DHW heater with gas-fired unit**	50	2,672	3,910	0.8	-133	-133	0	0	436	15	6,540	6.1	145	965	14	2,458
	8	**Replace (1) kitchen compact refrigerators with 2.7 cu. Ft. ENERGY STAR models**	0	198	160	0	0	0	0.3	0	30	12	360	6.6	82	682	11	97

APPENDIX H: METHOD OF ANALYSIS

Assumptions and tools

Energy modeling tool:	Established/standard industry assumptions, E-Quest
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 Police Department 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 Police Department(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.