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June 28, 2010

Local Government Energy Program
Energy Audit Report

For

Township of Sparta

Germany Flats including Storage Garage
12 Park Lake Road
Sparta, NJ 07871

Project Number: LGEA21

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INTRODUCTION

As an approved energy consulting firm under the Local Government Energy Audit Program (LGEA), Steven Winter Associates, Inc. (SWA) was selected to perform an energy audit and assessment for the Township of Sparta buildings. For this audit, the PMK Group, an approved subcontractor under the LGEA, performed the assessment of the large mechanical and electrical systems including HVAC equipment. The audit included a review of Germany Flats – 12 Park Lake Road, Germany Flats – Storage Garage, Fire Headquarters, Library, Public Works Facility, Public Works Facility – Satellite Garage, Eagle's Nest Well House as well as the Sparta Municipal Building. The buildings are located in Sparta, NJ. A separate energy audit report is issued for each of the referenced buildings.

This report addresses the Germany Flats building including the Germany Flats Storage Garage located at 12 Park Lake Road, Sparta, NJ. The current conditions and energy-related information were collected in order to analyze and suggest the implementation of building improvements and energy conservation measures.

This report combines the Germany Flats building with the Germany Flats storage building since they are located on the same property and are served by the same electric meter and propane tank. Germany Flats was built in 2005 and consists of 1 floor with a total floor area of 4,832 square feet. The Storage Garage was built in 2005 and consists of 1 floor with a total floor area of 1,500 square feet. Combined the buildings have a total floor area of 6,332 square feet. The buildings serve as the primary pumping facility for the Township Water Utility as well as storage areas. The Main building also contains office space, a small laboratory and locker room. The Storage Garage is used mainly for storage. The buildings are occupied by 10 employees for approximately 61 hours per week.

The goal of this Local Government Energy Audit (LGEA) is to provide sufficient information to Township of Sparta to make decisions regarding the implementation of the most appropriate and most cost effective energy conservation measures for the building.

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 75% of the cost of the audit. If the net cost of the installed measures recommended by the audit, after applying eligible NJ SmartStart Buildings incentives, exceeds the remaining cost of the audit, then that additional 25% will also be paid by the program. The Board of Public Utilities (BPU's) Office of Clean Energy has assigned TRC Energy Services to administer the Program.

- Section 1 and section 2 of the report cover a description and analysis of the building existing conditions.
- Section 3 provides a detail inventory of major electrical and mechanical systems in the building.
- Sections 4 through 7 provide a description of our recommendations.
- Appendices include further details and information supporting our recommendations.

EXECUTIVE SUMMARY

The energy audit performed by Steven Winter Associates (SWA) encompasses the Germany Flats building as well as the Germany Flats Storage Garage located at 16 Woodport Road, Sparta, NJ. Each building consists of one story and combined they have is a total floor area of 6,331 square feet. The buildings were built in 2005 and serve as the primary pumping facility for the Township Water Utility as well as Storage for the Water department. The main building also contains office space, a small laboratory and locker room. The original structures have not undergone any major renovations or additions.

Based on the field visits performed by the SWA staff on August 25th and September 3rdth, 2009 and the results of a comprehensive energy analysis, this report describes the site's current conditions and recommendations for improvements. Suggestions for measures related to energy conservation and improved comfort are provided in the scope of work. Energy and resource savings are estimated for each measure that results in a reduction of heating, cooling, and electric usage.

Existing conditions

From September 2008 through September 2009, the period of analysis for this audit, the buildings consumed 455,200 kWh or $84,608 worth of electricity at an approximate rate of $0.194/kWh and 7,094 gallons or $8,466 worth of propane at an approximate rate of $1.292/therm. The joint energy consumption for the buildings, including both electricity and fossil fuel, was 2,227 MMBtus of energy that cost a total of $93,074.

SWA has entered energy information about the Germany Flats building in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The building was benchmarked as a multi-use building and therefore was not able to receive an Energy Star performance rating. SWA encourages the Township of Sparta to continue entering utility data in *Energy Star Portfolio Manager* in order to track weather normalized source energy use over time. The current Site Energy Use Intensity is 358.0 kBtu/ft^2yr.

Recommendations

Implementing this report's recommendations will reduce use by approximately 8.4 kBtu/ft^2yr, which would decrease the building's energy use intensity to 349.6 kBtu/ft^2yr.

SWA recommends a package of measures that addresses lighting as well as building HVAC systems. Since the building serves as the primary pumping facility as well as small office spaces, increasing the efficiency of the HVAC systems is the best opportunity for energy savings.

Based on the assessment of the building, SWA has separated the recommendations into three categories (See Section 4 for more details). These are summarized as follows:

Category I Recommendations: Capital Improvement Measures

- Increase attic insulation levels
- Increase soffit venting

Category II Recommendations: Operations and Maintenance

- Investigate water leaks
- Maintain roofs
- Install downspout diverters

- Routine maintenance inspections of exterior walls, windows and doors
- Provide weather stripping / air sealing
- Use Energy Star labeled appliances

Category III Recommendations: Energy Conservation Measures

At this time, SWA highly recommends a total of **2** Energy Conservation Measures (ECMs) for the Germany Flats building that is summarized in the following Table 1. The total investment cost for these ECMs with incentives is **$16,550**. SWA estimates a first year savings of **$4,746** with a simple payback of **3.5 years**. SWA also recommends **1** ECM with a payback of greater than 10 years that is summarized in Tables 2 and 3, respectively.

The implementation of all the recommended ECMs would reduce the building electric usage by 25,750 kWh annually, or 61% of the building's current electric consumption. This building has an extremely high usage of electricity since it is used as the primary pumping facility of the town and therefore contains process loads. The implementation of all the recommended ECMs would also reduce the building propane usage by 645 therms or 10% of the building's current propane consumption. SWA estimates that implementing these ECMs will reduce the carbon footprint of the Germany Flats building by **53,215lbs of CO_2**, which is equivalent to removing approximately 2 cars from the roads each year or avoiding the need of 128 trees to absorb the annual CO_2 produced. SWA also recommends that the Township of Sparta contacts third party energy suppliers in order to negotiate a lower electricity rate. Comparing the current electric rate to average utility rates of similar type buildings in New Jersey, it may be possible to save up to $0.044/kWh, which would have equated to $20,029 for the past 12 months. This cost savings is dependent upon the building's ability to shed peak demand load that is used for the pumping portion of the facility.

BSG-PMK/SWA has reviewed several funding options for the purposes of subsidizing the costs for installing the energy conservation measures noted within this report.

Although funding options are constantly changing and updating this project may benefit from enrolling in a number of alternative programs such as the; the NJ SmartStart program, ARRA grants available through the NJ Office of Clean Energy, alternate funding by applying for financing and competitive grants through the United States Department of Energy as well as local utility incentive programs in an effort to offset a portion of the cost of ECM implementation.

The Smart Start program offers reimbursement incentives for various equipment purchases, and lighting incentives. The benefits and requirements of this program can be found at:

http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/nj-smartstart-buildings

The Germany Flats buildings are not eligible for Direct Install since the electrical demand is greater than 200kW per month.

Financial assistance is also available through the United States Department of Energy in the form of; Grants, Cooperative Research and development agreements, small business innovation research, and Loan Guarantee Programs. Further information for these programs is available at:

http://www1.eere.energy.gov/financing/types_assistance.html

Local Utility incentives such as a Direct Install Program, offer incentives that can provide up to 80% subsidy of the cost to install particular ECM's. As each utility company has different guidelines and incentives it is important to contact your local utility authority for eligibility in these programs.

Additional funding may also be found through the following funding methods:

- Energy Savings Improvement Program (ESIP) – Public Law 2009, Chapter 4 authorizes government entities to make energy related improvements to their facilities and par for the costs using the value of energy savings that result from the improvements.

- Municipal Bonds – Municipal bonds are a bond issued by a city or other local government, or their agencies. Municipal bonds may be general obligations of the issuer or secured by specified revenues. Interest income received by holders of municipal bonds is often exempt from the federal income tax and from the income tax of the state in which they are issued, although municipal bonds issued for certain purposes may not be tax exempt.

- Power Purchase Agreement – Public Law 2008, Chapter 3 authorizes contractor of up to fifteen (15) years for contracts commonly known as "power purchase agreements." These are programs where the contracting unit (Owner) procures a contract for, in most cases, a third party to install, maintain, and own a renewable energy system.

BSG-PMK/SWA recommends the Owner review the use of the above-listed funding options in addition to utilizing their standard method of financing for facilities upgrades in order to fund the proposed energy conservation measures.

The following two tables summarize the proposed Energy Conservation Measures (ECM) and their economic relevance.

Table 1 - Highly Recommended 0-5 Year Payback ECMs																		
ECM #	ECM description	Source	est. installed cost, $	est. incentives, $	net est. ECM cost with incentives, $	kWh, 1st yr savings	kW, demand reduction/mo	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 energy cost savings, $	simple payback, yrs	lifetime return on investment, %	annual return on investment, %	internal rate of return, %	net present value, $	CO_2 reduced, lbs/yr
1	Install 6 new Occupancy Sensors	RSMeans	660	120	540	1,025	0.2	0	0.2	0	175	15	2,062	3.1	281.9	18.8	32.0	1,552	1,835
2	Replace rooftop unit (RTU-1)	Contractor	16,550	540	16,010	22,468	4.7	645	7.8	0	4,570	15	53,778	3.5	235.9	15.7	27.8	38,549	47,339
	TOTALS		**17,210**	**660**	**16,550**	**23,493**	**4.9**	**645**	**8.0**	**0**	**4,746**	**-**	**55,841**	**3.5**	**-**	**-**	**-**	**40,102**	**49,174**

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

Table 2 – End of Life Cycle ECMs (>10 year payback)																		
ECM #	ECM description	Source	est. installed cost, $	est. incentives, $	net est. ECM cost with incentives, $	kWh, 1st yr savings	kW, demand reduction/mo	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 energy cost savings, $	simple payback, yrs	lifetime return on investment, %	annual return on investment, %	internal rate of return, %	net present value, $	CO_2 reduced, lbs/yr
3	Replace Split-System Air Conditioner	RSMeans	5,500	$0	5,500	2,257	0.1	0	0.4	0	386	15	4,541	14.3	-17.4	-1.2	0.6	(893)	4,041
	TOTALS		**5,500**	**0**	**5,500**	**2,257**	**0.1**	**0**	**0.4**	**0**	**386**	**-**	**4,541**	**14.3**	**-**	**-**	**-**	**-893**	**4,041**

1. HISTORIC ENERGY CONSUMPTION

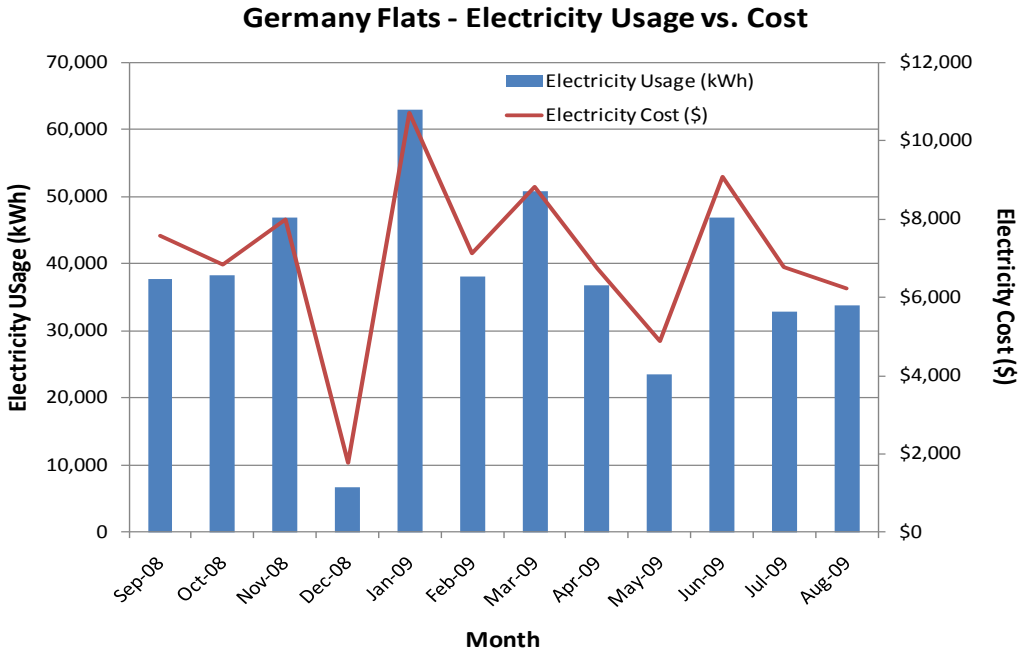
1.1. Energy usage, load profiles and cost analysis

SWA analyzed utility bills from **September 2008 through September 2009** (period of analysis) that were received from the utility companies supplying the Germany Flats building with electricity and propane. The Germany Flats building currently contains one propane tank and one electric meter.

Electricity – The Germany Flats building currently buys electricity from JCP&L at **an average rate of $0.194/kWh** based on 12 months of utility bills from September 2008 to September 2009. The building purchased **approximately 455,200 kWh or $84,608 worth of electricity** in the previous year. The Germany Flats building is charged separately for demand (kW) which has been factored into each monthly bill. Compared to other commercial buildings in NJ, Germany Flats has a high electricity rate based on the amount of usage that occurs during peak load periods. Based on the same time period, the electric meter also has **an average monthly demand of 235.8 kW and a monthly peak demand of 252.5 kW.**

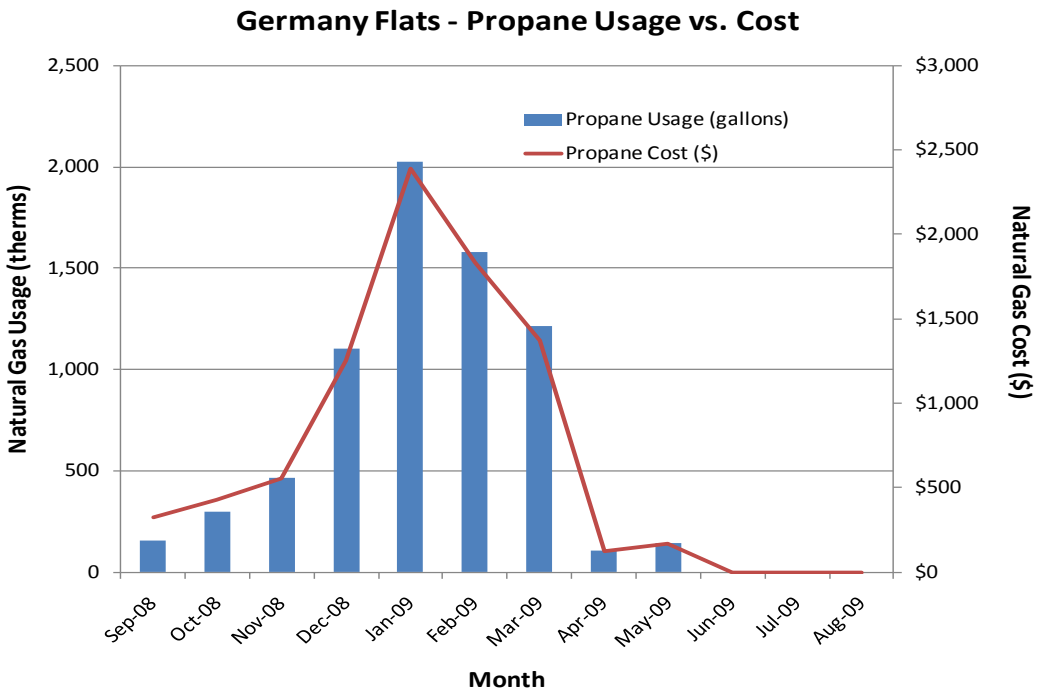
Natural gas – The Germany Flats building is currently served by Amerigas for propane. The building currently buys propane from Elizabethtown Gas at **an average rate of $1.292/gallon** based on 12 months of utility bills from September 2008 to September 2009. The building purchased **approximately 7,094 gallons or $8,466 worth of propane** in the previous year.

The following chart shows electricity use versus cost for the Germany Flats building based on utility bills for the 12 month period of September 2008 to September 2009.

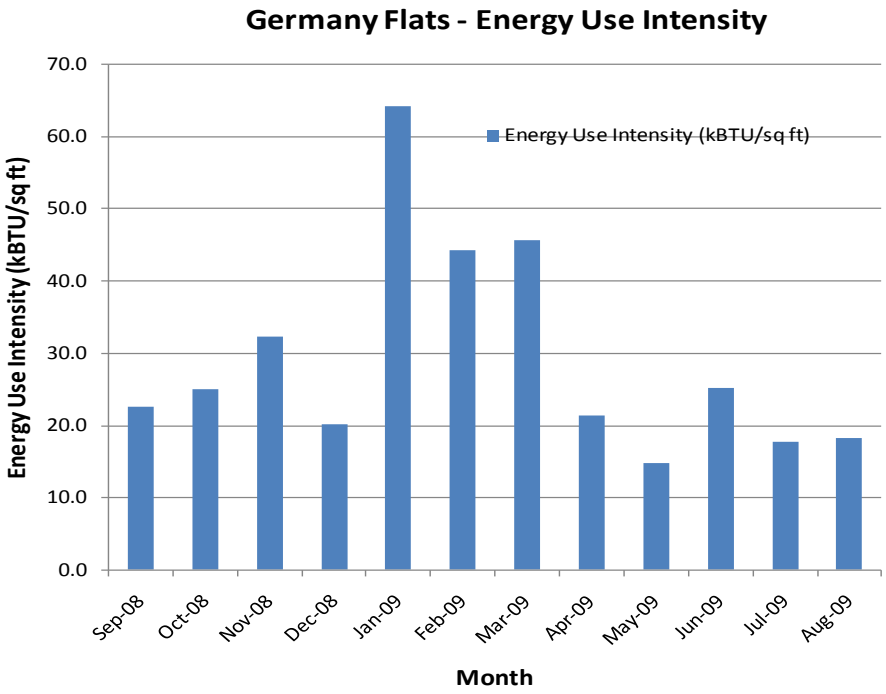


The electricity cost follows a trend line similar to that of the electricity usage as expected.

The following chart shows propane use versus cost for the Germany Flats building based on utility bills for the 12 month period of September 2008 to September 2009.



The following chart shows combined propane and electric consumption in kBtu/sq ft for the Germany Flats building based on utility bills for the 12 month period of September 2008 to September 2009.

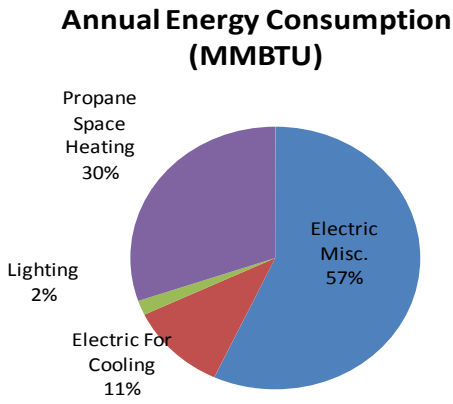


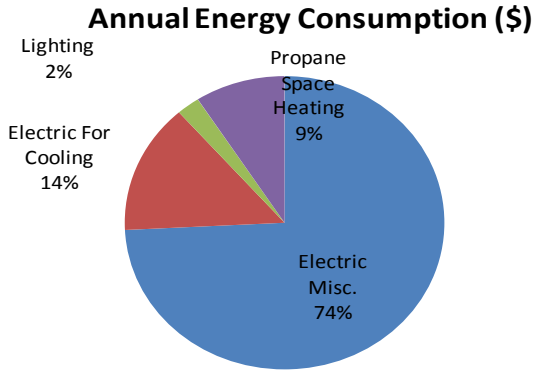
Energy Use Intensity fluctuates with the heating and cooling season as expected. Energy use peaks during January, when heat is being used the most.

The following table and chart pies show energy use for the Germany Flats building based on utility bills for the 12 month period of September 2008 to September 2009. Note electrical cost at $54.5/MMBtu of energy is more than 4 times the cost of propane at $12.6/MMBtu. Also, miscellaneous electric use accounts for a large percentage of the building electric use due to pump operations, computers, mechanical ventilation and other plug-loads not accounted for during the audit.

2008 Annual Energy Consumption / Costs					
	MMBtu	% MMBtu	$	% $	$/MMBtu
Electric Miscellaneous	1268	57%	$69,106	74%	54.5
Electric For Cooling	245	11%	$13,353	14%	54.5
Lighting	40	2%	$2,180	2%	54.5
Propane Space Heating	674	30%	$8,492	9%	12.6
Totals		100%	$93,131	100%	
Total Electric Usage	1,553	70%	$84,608	91%	54.5
Total Propane Usage	674	30%	$8,466	9%	12.6
Totals	2,227	100%	$93,074	100%	

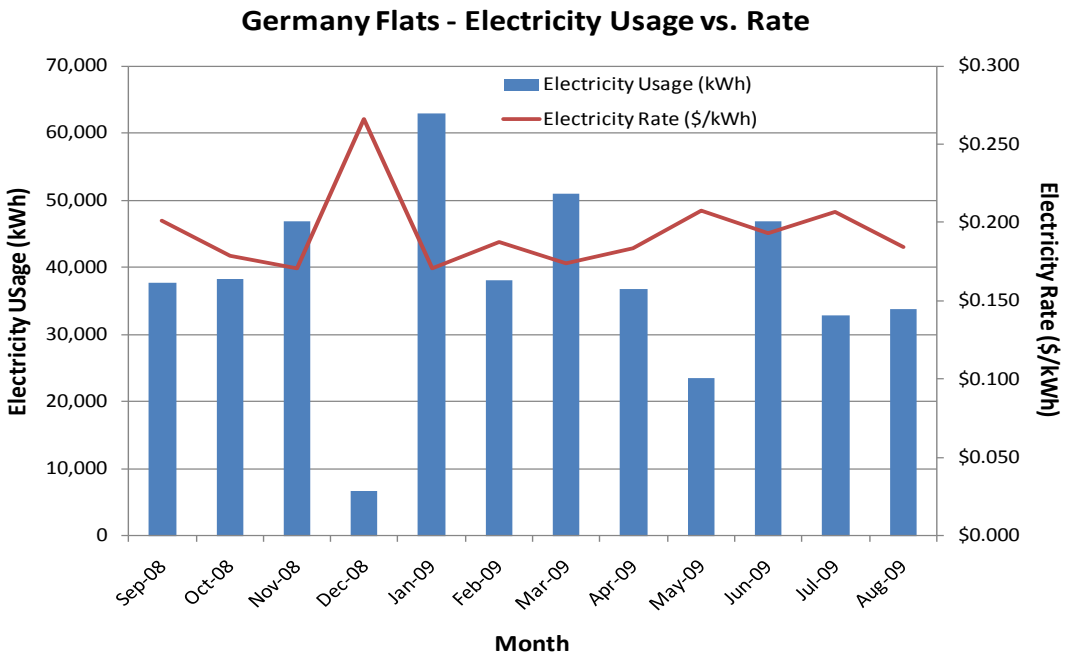
*Electric Miscellaneous represents electric use associated with pumping operations as well as plug-loads within the building





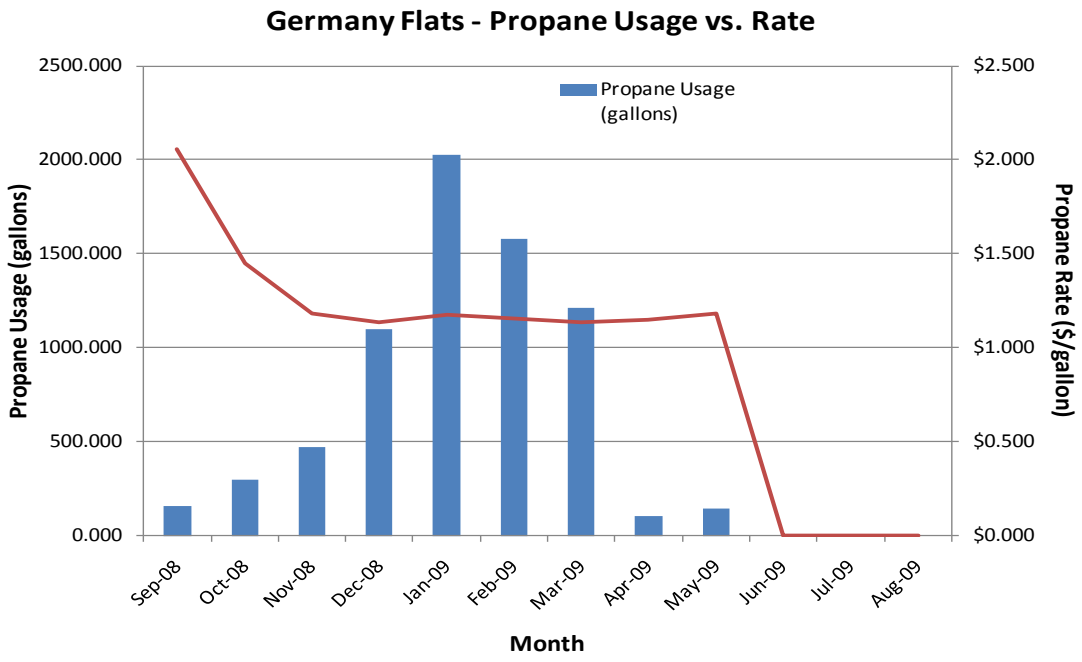
1.2. Utility rate analysis

The Germany Flats buildings currently purchases electricity from JCP&L at a general service market rate for electricity use (kWh) including a separate (kW) demand charge that is factored into each monthly bill. The Germany Flats buildings currently pays an average rate of approximately $0.194/kWh based on the 12 months of utility bills of September 2008 to September 2009. Demand prices are reflected in the utility bills and can be verified by observing the price fluctuations throughout the year. The electric rate does not show large fluctuations throughout the year and therefore appears to be the appropriate rate for the building.



The electricity rate fluctuates inversely proportional to usage, as expected. Typically, the more units of electricity that are used by the building, the cheaper electricity becomes per unit. Some rate fluctuations may be due to estimated utility readings as opposed to actual readings.

The Germany Flats buildings currently purchases propane from Amerigas at a general service market rate for propane use (gallons). The building currently pays an average rate of approximately $1.292/gallon based on the 12 months of utility bills of September 2008 to September 2009. The propane rate does not show large fluctuations throughout the year and therefore appears to be the appropriate rate for the building.



The propane rate fluctuates inversely proportional to usage, as expected. Typically, the more units of propane that are used by the building, the cheaper propane becomes per unit. In summer periods, when a minimal amount of propane is used, the propane rate ($/gallon) increases sharply until propane use hits 0 gallons.

Some of the minor unusual utility fluctuations that showed up for a couple of months on the utility bills may be due to adjustments between estimated and actual meter readings.

1.3. Energy benchmarking

SWA has entered energy information about the Germany Flats buildings in the U.S. Environmental Protection Agency's (EPA) *Energy Star Portfolio Manager* Energy benchmarking system. The buildings were benchmarked as multi-use type building. The buildings were not able to receive an Energy Star performance rating since the buildings are classified as multi-use buildings, which are currently ineligible for a performance score through the Benchmarking tool. SWA encourages the Township of Sparta to continue entering utility data in *Energy Star Portfolio Manager* in order to track weather normalized source energy use over time. The current Site Energy Use Intensity is 358.0 kBtu/ft^{2}yr.

Implementing this report's highly recommended Energy Conservations Measures (ECMs) will reduce use by approximately 8.0 kBtu/ft^{2}yr, with an additional 0.1 kBtu/ft^{2}yr from the recommended End of Life cycle ECMs.

Per the LGEA program requirements, SWA has assisted the Township of Sparta to create an *Energy Star Portfolio Manager* account and has shared the Library building facility information to allow future data to be added and tracked using the benchmarking tool. SWA is sharing this Portfolio Manager Site information with TRC Energy Services. As per requirements, the account information is provided below:

Username: SpartaTownship

Password: SPARTA2009

Also, below is a performance rating that is generated based on historical energy consumption from the Portfolio Manager Benchmarking tool.

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Township of Sparta - Germany Flats

Building ID: 1857329
For 12-month Period Ending: July 31, 2009[1]
Date SEP becomes ineligible: N/A
Date SEP Generated: February 22, 2010

Facility
Township of Sparta - Germany Flats
12 Park Lake Road
Sparta, NJ 07871

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 2005
Gross Floor Area (ft²): 6,332

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

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	1,558,056
Liquid Propane (kBtu)	710,491
Natural Gas - (kBtu)[4]	0
Total Energy (kBtu)	2,268,547

Energy Intensity[5]	
Site (kBtu/ft²/yr)	358
Source (kBtu/ft²/yr)	935

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	282

Electric Distribution Utility
FirstEnergy - Jersey Central Power & Lt Co

National Average Comparison	
National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	339%
Building Type	Other

Stamp of Certifying Professional

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

Certifying Professional
N/A

Meets Industry Standards[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

2. FACILITY AND SYSTEMS DESCRIPTION

2.1. Building Characteristics

The Germany Flats facility consists of a main building used as the primary pumping facility for the Township Water Utility as well as a Storage Garage located on the same property. The Germany Flats main building is a single-story structure that consists of 4,832 and the storage garage is a single-story structure that consists of 1,500 square feet. Combined the buildings have a total floor area of 6,332 square feet. The buildings were built in 2005 and currently house the primary pumping operations for the Township Water Utility as well as contains office space, a small laboratory, a locker room and a storage garage.

2.2. Building occupancy profiles

The Germany Flats buildings are occupied by 10 employees. The buildings are operated for approximately 61 hours per week.

2.3. Building envelope

2.3.1.Exterior Walls

Main building - The exterior walls consist of 8" CMU blocks with split block exterior and clapboard siding on both gables. According to the drawings, there is R-11 insulation in the block walls.

This recently constructed building's exterior envelope walls were observed to be in poor condition with signs of previous and present water and moisture problems. Effloresence on the exterior and interior masonry surfaces and damaged gypsum wall board is visible in some areas, indicating a hidden source of water, possibly from the gutter/ soffit area. Further investigation that exceeds SWA's scope is necessary.

Efflorescent and other water problems visible on the interior and exterior walls

Storage Garage – The exterior walls were observed to be metal framed aluminum sidewalls. There was no insulation present.

Overall, exterior and interior wall finishes of the envelope were found to be in age-appropriate, good condition with the exception of some water damage to exterior walls. SWA recommends that Sparta perform bi-annual inspections to maintain building weather-stripping and sealing as well as perform preventative maintenance to the exterior surfaces.

2.3.2.Roof

The wood framed low pitch standing seam metal roof shows no visual signs of leakage. Attic insulation levels could not be verified but in some areas fiberglass batt insulation was visible through gypsum board openings in the ceiling. SWA recommends a minimum of R-30 attic insulation and that all gypsum board ceiling penetrations be sealed and covered as required by code.

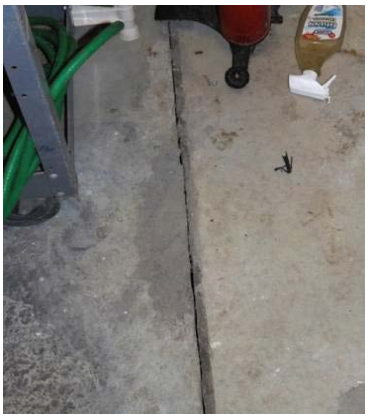
Soffit and ridge vents were identified and SWA recommends verifying that unobstructed air flow between the two is provided. This helps to prolong the life of the installed metal roof and minimize potential leakage which can compromise insulation performance and structural components.

Gutters and downspouts were inspected and found to be in good condition but need to be inspected for possible leakage as mentioned under "Exterior Walls". SWA recommends that all downspout diverters slope away from exterior walls to minimize potential water and moisture problems around the perimeter foundation.


Downspout diverter with insufficient slope *Unsealed openings in ceiling*

2.3.3. Base

The building's base is a 4" concrete slab-on grade with a perimeter footing. There were numerous signs of structural cracks, possibly a differential settlement issue. SWA recommends having the slab and foundation evaluated by a structural engineer.


Signs of differential settlement in slab

2.3.4. Windows

The building contains double hung and awning type double glazed vinyl windows. A low-E coating could not be verified. The windows showed no visual signs of water/ moisture leakage or air infiltration and were found to be in overall good condition.

SWA recommends exterior and interior inspections of all windows as part of the building's routine maintenance schedule to ensure air and water tight performance year round.

2.3.5. Exterior doors

The metal exterior doors were observed to be in good condition except for some missing or worn weather-stripping, including the overhead type doors, where excessive wear was detected. SWA recommends that the exterior doors of the building be weather-stripped in order to decrease the amount of conditioned air that is lost around each door. SWA also recommends checking the weather-stripping of each door on a regular basis and replacing any broken seals immediately. Tight seals around doors will help ensure the building to be is kept continuously insulated.

Worn and missing weather stripping around doors

2.3.6. Building air tightness

In addition to the above mentioned recommendations SWA suggests air sealing, caulking and/ or insulating around all plumbing, electrical, HVAC and structural envelope penetrations. This should include bottom and top plates, recessed light fixtures, electrical boxes, chimney walls and window, or sleeve air conditioner units. The air tightness of buildings helps to maximize other implemented energy measures and investments and minimizes long term maintenance and repair cost.

2.4. HVAC Systems

2.4.1. Heating

Germany Flats Well House Pump Bldg - One propane-fired unit heater, rated at 50 MBH.

Germany Flats Booster Pump Bldg - There is one 30 MBH unit heater, and one indirect- and propane-fired make-up air unit (MUA-1), located on the pitched roof. This unit serves the chemical room and the pump room. It is rated at 2,200 CFM and 196 MBH heating, and is rates AFUE 79% efficient.

Germany Flats Storage Garage -_The supervisor's office is heated by a dedicated gas heater. Space heating for the garage is provided by two gas-fired infrared heaters, which replaced a gas-fired, forced-air furnace and distribution ducts. Infrared heat only occurs when the garage is occupied.

2.4.2. Cooling

Germany Flats Well House Pump Bldg - There is no cooling provided to this building. As a result there is no cooling equipment located at the Pump Building

Germany Flats Booster Pump Bldg - There is one split-system, DX air conditioner for the office, rated at 11,800 BTUH, and a rooftop unit (RTU-1) that provides 7.5 tons of DX cooling and 126 MBH of heating to the pump building office area. This indirect- and propane-fired unit is rated at 3,100 CFM and is 81% efficient.

2.4.3. Ventilation

Germany Flats Well House Pump Bldg - One exhaust fan, rated at 350 CFM.

Germany Flats Booster Pump Bldg - 13 wall- or ceiling-mounted exhaust fans, ranging from 75 CFM to 1,100 CFM.

Germany Flats Storage Garage - Not applicable, there is no ventilation at the Storage Garage.

2.4.4. Domestic Hot Water

The Germany Flats building contains no domestic hot water.

2.5. Electrical systems

2.5.1. Lighting

Interior Lighting – The Germany Flats building contains efficient T8 fluorescent fixtures with electronic ballasts for general lighting. Areas such as the Main hallways and Conference rooms already contain efficient CFL lamps. SWA identified 6 areas that could benefit from the installation of occupancy sensors. The areas identified were mainly bathrooms and other smaller rooms located in the building that is used sporadically throughout the day. See Appendix A for complete existing and proposed lighting schedule.

Exit Lights – The exit signs were observed to be efficient LED models. LED exit signs are the most energy efficient option and are valuable for cost savings since they operate 24 hours per day, 7 days per week. See attached existing and proposed lighting schedule in Appendix A.

Exterior Lighting - The exterior lighting surveyed revealed that there were 4 exterior fixtures that contained two CFL lamps each. These fixtures are efficient and are would not be cost-effective to upgrade at this point in time. See attached existing lighting schedule in Appendix A.

2.5.2. Appliances

SWA performed a basic survey of appliances installed at the Germany Flats building. Appliances, such as refrigerators, that are over 10 years of age should be replaced with newer efficient models with the Energy Star label. For example, Energy Star refrigerators of similar size to the existing units, use as little as 315 kWh/year. When compared to the average electrical consumption of older equipment, Energy Star equipment results in a large energy as well as cost 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

2.5.3.Elevators

The building is one-story and therefore contains no elevator.

2.5.4.Process and others electrical systems

There are four premium-efficiency pumps in the pump room, all with variable-frequency drives. Pumps 1A and 1B are American Turbine pumps with 250 HP, 1,780 RPM, Emerson motors rated at 95.8% efficiency. Pumps 2A and 2B are American Turbine pumps with 125 HP, 1,795 RPM Emerson motors, rated at 95.4% efficiency. There are three chemical pumps in the chemical room, all with fractional-HP motors. All motors and pumps were installed in 2005 and were found in good operating condition.

Pumps and motors located at Germany Flats

3. EQUIPMENT LIST

Inventory

Building System	Description	Physical Location	Model #	Fuel	Space Served	Estimated Remaining Useful Life %
Heating/Cooling	50 MBH unit heater	Mechanical Room	-	Propane	Well house pump buildings	65
Ventilation	350 CFM exhaust fan	Ceiling	-	Electric	Well house pump buildings	50
Heating/Cooling	30 MBH unit heater (controlled by a local thermostat)	Booster Pump building	-	Propane	Booster pump building	65
	Indirect-fired make-up air unit (2,200 CFM, 196 MBH heat, 79% efficient)	Booster Pump building	-	Propane/ Electric	Booster pump building - chemical room, pump room	50
	Split-system DX air-conditioner (11,800 BTUH)	Booster Pump building	-	Electric	Booster pump building - office	60
	Indirect-fired rooftop unit (7.5 tons cooling, 126 MBH heat, 81% efficient, 3,100 CFM)	Booster Pump building	-	Propane/ Electric	Booster pump building - office area	50
Ventilation	13 wall- or ceiling-mounted exhaust fans (ranging from 75 to 1,100 CFM)	Booster Pump building	-	Electric	Booster pump building	75
Heating/Cooling	Dedicated gas heater	Mechanical Room	-	Propane	Storage garage - supervisor's office	50
	Residential-grade air-conditioner	Mechanical Room	-	Electric	Storage garage - supervisor's office	40
	2 infrared heaters	Garage Area	-	Propane	Storage garage	50
Pumps	Two (2) pumps - Pump 1A and 1B - American Turbine pump, premium efficiency Emerson motors with VFD controls, 250 HP, 1,780 RPM, 95.8% efficiency, installed 2005	Pump room	American Turbine pump, Emerson motor, Model #NA, Serial #NA	Electric	Town Water system	75
Pumps	Two (2) pumps - Pump 2A and 2B - American Turbine pump, premium efficiency Emerson motors with VFD controls, 125 HP, 1,795 RPM, 95.4% efficiency, installed 2005	Pump room	American Turbine pump, Emerson motor, Model #NA, Serial #NA	Electric	Town Water system	75
Pumps	Three (3) chemical pumps, all with fractional HP, installed 2005	Pump room	American Turbine pump, Emerson motor, Model #NA,	Electric	Town Water system	75

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.

4. ENERGY CONSERVATION MEASURES

Based on the assessment of the Municipal building, SWA has separated the investment opportunities into three recommended categories:

1. Capital Improvements - Upgrades not directly associated with energy savings
2. Operations and Maintenance - Low Cost / No Cost Measures
3. Energy Conservation Measures - Higher cost upgrades with associated energy savings

Category I Recommendations: Capital Improvements

- Increase attic insulation levels – SWA recommends that insulation with a minimal insulation value of R-30 is added and maintained in the plenum above the ceiling.

- Increase soffit venting – SWA observed that the amount of soffit vents was found to be insufficient. SWA recommends using additional venting in order to prolong life of the installed synthetic slate roof and minimize potential leakage. Roof ventilation should be installed according to local building codes.

Category II Recommendations: Operations and Maintenance

- Investigate water leaks – The recently constructed building's exterior envelope walls were observed to have water damage and moisture problems. Efflorescence on the exterior and interior masonry surfaces and damaged gypsum wall board is visible in some areas, indicating a hidden source of water, possible from the gutter/soffit area. SWA recommends hiring an independent contractor to investigate the source of the leaks and take corrective actions as soon as possible.

- Maintain roofs - SWA recommends regular maintenance to verify water is draining correctly.

- Install downspout diverters – SWA observed that the building was properly fitted with gutters and downspouts; however the downspouts allow the water to pool directly next to the exterior wall of the building. SWA recommends installing downspout diverters in order to divert water away from the building in order to prevent damage to the exterior walls.

- Routine maintenance inspections of exterior walls, windows and doors – SWA observed several areas around windows and doors that were missing caulking and created openings allowing insects to build nests where there were surface transitions. SWA recommends routine maintenance inspections to prevent insect nesting and look for minor maintenance issues that have the potential of creating larger problems in the future.

- Provide weather stripping / air sealing – SWA observed that all windows and doors had proper weather-stripping and air sealing due to their age. As a best practice, SWA recommends that each window and door is inspected twice per year for deficiencies. Any time that a seal has been compromised, building maintenance staff should repair and replace the seal immediately to ensure that thermal barriers are not breached.

- Use Energy Star labeled appliances - such as Energy Star refrigerators that should replace older energy inefficient equipment.

Category III Recommendations: Energy Conservation Measures

Summary table

ECM#	Description of Highly Recommended 0-5 Year Payback ECMs
1	Install 6 new Occupancy Sensors
2	Replace rooftop unit (RTU-1)
	Description of Recommended End of Life Cycle ECMs (>10 year payback)
3	Replace Split-System Air Conditioner

ECM#1: *Install 6 new occupancy sensors*

Description:

Based on field observations, there are 6 areas within the Germany Flats building that would benefit from the installation of occupancy sensors. SWA recommends that these 6 areas are upgraded to occupancy sensors in order to reduce the amount of runtime based on occupancy schedules. See Appendix A for complete lighting schedule and analysis.

Installation cost:

Estimated installed cost: $540
Source of cost estimate: RS *Means; Published and established costs*

Economics:

ECM #	ECM description	Source	est. installed cost, $	est. incentives, $	net est. ECM cost with incentives, $	kWh, 1st yr savings	kW, demand reduction/mo	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 energy cost savings, $	simple payback, yrs	lifetime return on investment, %	annual return on investment, %	internal rate of return, %	net present value, $	CO_2 reduced, lbs/yr
1	Install 6 new Occupancy Sensors	RSMeans	660	120	540	1,025	0.2	0	0.2	0	175	15	2,062	3.1	281.9	18.8	32.0	1,552	1,835

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis. SWA assumes amount of reduced hours based on field observations.

Rebates / financial incentives:
NJ Clean Energy Prescriptive Lighting Controls – Wall-mounted occupancy sensors ($20 per control)
Maximum incentive amount is $120

Options for funding ECM:
NJ Office of Clean Energy – SmartStart, Direct Install programs

ECM#2: *Replace rooftop unit (RTU-1)*

Description:

A rooftop unit (RTU-1), located on the peaked roof, serves the office area. It is an indirect- and propane-fired unit, with 7.5 tons of DX cooling, 126 MBH of heating, and is rated at 3,100 CFM and 81% efficiency. It is recommended that when the unit reaches its useful life of 15 years, that it be replaced with a newer, higher-efficiency unit, that uses R-410a (Puron) refrigerant, as opposed to the current model, which is standard-efficiency and uses R-22 refrigerant. These high-efficiency units have Seasonal Energy Efficiency Ratios (SEERs) of up to 15, whereas the R-22 units have SEERs only up to about 11.5.

Installation cost:

Estimated installed cost: $16,010
Source of cost estimate: Contractor (Struble Mechanical Services, Fairfield, NJ)

Economics:

ECM #	ECM description	Source	est. installed cost, $	est. incentives, $	net est. ECM cost with incentives, $	kWh, 1st yr savings	kW, demand reduction/mo	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 energy cost savings, $	simple payback, yrs	lifetime return on investment, %	annual return on investment, %	internal rate of return, %	net present value, $	CO_2 reduced, lbs/yr
2	Replace rooftop unit (RTU-1)	Contractor	16,550	540	16,010	22,468	4.7	645	7.8	0	4,570	15	53,778	3.5	235.9	15.7	27.8	38,549	47,339

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis. SEER values for rooftop units that use R-22 refrigerant are about 11.5, at the time of installation. At the end of the unit's useful life, it will be about 75% of this value, or 8.6. The new unit should have a SEER of 14.8 or higher. Climate data was provided by the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE). The values of 1,024 cooling degree-days and a 0.4% dry-bulb temperature of 93°F were used. The desired indoor temperature during the cooling season was assumed to be 74°F. The efficiency for the heating coil will also be 75% of its original value of 81%, or about 61%. The number of heating degree days used for calculations was 5,034 and the 99.6% heating dry-bulb temperature was 10°F, both also provided by ASHRAE. The desired indoor temperature for the heating season was assumed to be 68°F.

Rebates / financial incentives:
NJ Clean Energy – Electric Unitary HVAC – Central DX AC Systems ($40-$72 per ton)

Maximum incentive of $540

Options for funding ECM:
NJ Office of Clean Energy – SmartStart, Direct Install programs

ECM#3: *Replace Split-System Air Conditioner*

Description:

A small split-system, DX air-conditioner serves the building's head office. It has a capacity of 11,800 BTUH (0.98 tons). It is recommended that, when the unit reaches its useful life of 15 years, that it be replaced with a newer, higher- efficiency unit that uses R-410a (Puron) refrigerant, as opposed to the current model, which is standard-efficiency and uses R-22 refrigerant. These high-efficiency units have Seasonal Energy Efficiency Ratios (SEERs) of up to 13, whereas the R-22 units have SEERs up to about 12.

Installation cost:

Estimated installed cost: $5,500
Source of cost estimate: Contractor (Struble Mechanical Services, Fairfield, NJ)

Economics:

ECM #	ECM description	Source	est. installed cost, $	est. incentives, $	net est. ECM cost with incentives, $	kWh, 1st yr savings	kW, demand reduction/mo	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 energy cost savings, $	simple payback, yrs	lifetime return on investment, %	annual return on investment, %	internal rate of return, %	net present value, $	CO_2 reduced, lbs/yr
3	Replace Split-System Air Condtioner	RSMeans	5,500	0	5,500	2,257	0.1	0	0.4	0	386	15	4,541	14.3	-17.4	-1.2	0.6	(893)	4,041

Assumptions: SWA calculated the savings for this measure using measurements taken the days of the field visits and using the billing analysis. SEER values for split-system units of this size, that use R-22 refrigerant, are about 12 at the time of installation. At the end of the unit's useful life, it will be about 75% of this value, or 9. The new unit should have a SEER of 13 or higher. Climate data was provided by the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE). The values of 1,024 cooling degree-days and a 0.4% dry-bulb temperature of 93°F were used. The desired indoor temperature during the cooling season was assumed to be 74°F. Using this information, it was calculated that the new split-system would reduce the building's annual electric consumption by 2,257 kWh, totaling an annual savings of $451 and yielding a 12.2-year payback.

Rebates / financial incentives:
There are no incentives available for this measure at this time.

Options for funding ECM:
NJ Office of Clean Energy – SmartStart, Direct Install programs

5. RENEWABLE AND DISTRIBUTED ENERGY MEASURES

5.1. Existing systems

There are not currently any existing renewable energy systems.

5.2. Wind

A Wind system is not applicable for this building because the area does not have winds of sufficient velocity to justify installing a wind turbine system.

5.3. Solar Photovoltaic

Solar Photovoltaic panels are not recommended due to the minimal amount of available unobstructed South/South-West exposure.

5.4. Solar Thermal Collectors

Solar thermal collectors are not recommended for this project since the building does not contain a domestic hot water system.

5.5. Combined Heat and Power

CHP is not applicable for this building because of the HVAC system type and limited domestic hot water usage.

5.6. Geothermal

Geothermal is not applicable for this building because it would require significant modifications to the existing HVAC system, which would not be cost effective.

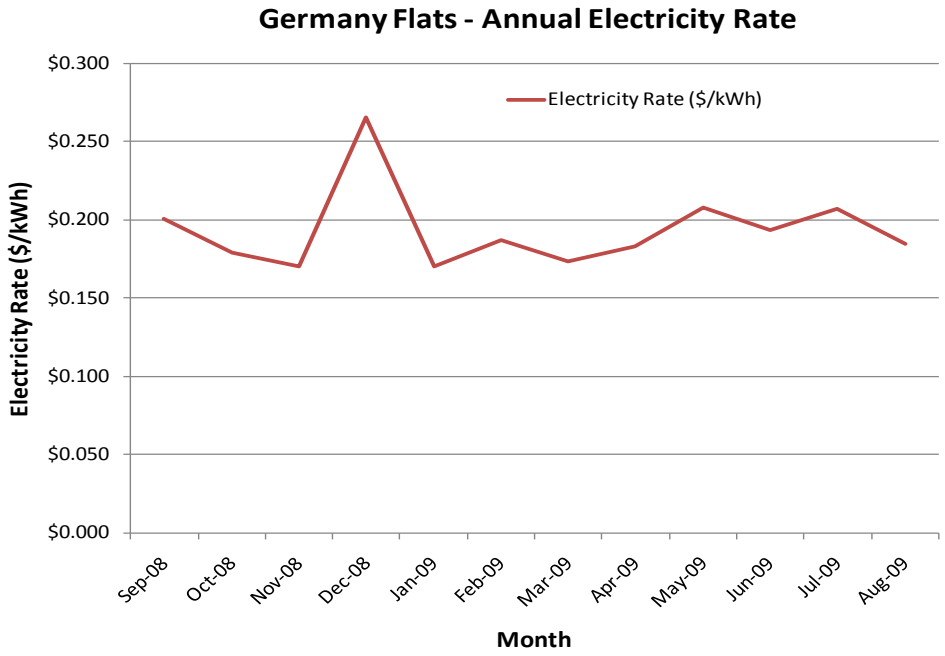
6. ENERGY PURCHASING AND PROCUREMENT STRATEGIES

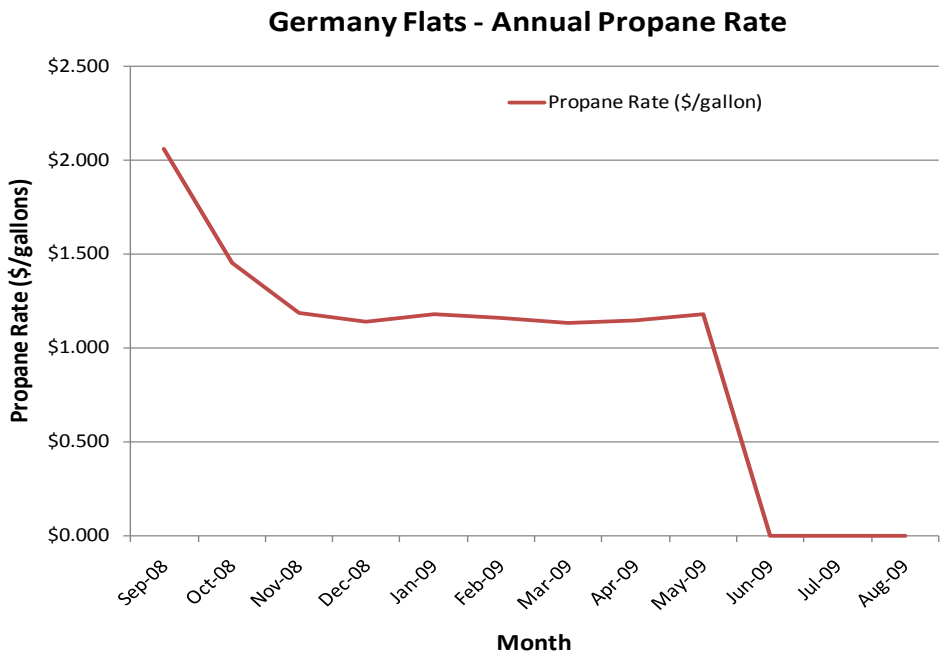
6.1. Energy Purchasing

The Germany Flats building receives propane via Amerigas through truck deliveries. There is not an ESCO engaged in the process. An Energy Services Company (ESCO) is a consultancy group that engages in a performance based contract with a client firm to implement measures which reduce energy consumption and costs in a technically and financially viable manner. Electricity is purchased via one incoming meter from JCP&L without an ESCO. SWA analyzed the utility rate for propane and electricity supply over an extended period. Electric bill analysis shows fluctuations of 36% over the most recent 12 month period. Propane bill analysis shows fluctuations up to 45% over the most recent 12 month period. Some of these fluctuations may have been caused by adjustments between estimated and actual meter readings, others may be due to unusual high and escalating energy costs in 2008.

Currently, New Jersey commercial buildings of similar type pay $0.150/kWh for electricity and $1.30/gallon for propane. Currently, the electricity rate for the Germany Flats building is $.194/kWh, which means there is a potential cost savings of $20,029 per year, however this number heavily relies on demand charges from the pumps being operated during peak demand times.. The current propane rate for the Germany Flats building is $1.292/gallon which is better than the average propane cost. A large cost

savings potential for electricity exists, however this involves contacting third party suppliers and negotiating utility rates. SWA recommends that the Township of Sparta further explore opportunities of purchasing electricity from third party energy suppliers in order to reduce rate fluctuation and ultimately reduce the annual cost of energy for the Germany Flats building. Appendix B contains a complete list of third party energy suppliers for the Township of Sparta service area. The Township of Sparta may want to consider partnering with other school districts, municipalities, townships and communities to aggregate a substantial electric and natural gas use for better leveraging in negotiations with ESCOs and of improving the pricing structures. This sort of activity is happening in many parts of the country and in New Jersey.





6.2. Energy Procurement strategies

Also, the Germany Flats building would not be eligible for enrollment in a Demand Response Program based on the current pump operation, because there isn't the capability at this time to shed a minimum of 150 kW electric demand when requested by the utility during peak demand periods, which is the typical threshold for considering this option.

7. METHOD OF ANALYSIS

7.1. Assumptions and tools

Energy modeling tool:	Established / standard industry assumptions, DOE 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

7.2. 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 BUILDING 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 BUILDING(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.

Appendix A: 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)
255	GF	Main hallway	pin-based	E	CFL	8	3	40	S	10	261	0	960	2,506	N/A	pin-based	CFL	None	S	8	3	40	10	261	0	960	2,506	0	0	0
256	GF	Main hallway	Exit sign	None	LED Exit	3	1	5	N	24	265	0	15	95	N/A	Exit sign	LED Exit	None	N	3	1	5	24	265	0	15	95	0	0	0
257	**GF**	**Chemical Room**	**Parabolic**	**E**	**4'T8**	**8**	**2**	**32**	**S**	**10**	**261**	**0**	**512**	**1,336**	**C**	**Parabolic**	**4'T8**	**None**	**OS**	**8**	**2**	**32**	**7.5**	**261**	**0**	**512**	**1,002**	**0**	**334**	**334**
258	GF	Chemical Room	Exit sign	None	LED Exit	1	1	5	N	24	365	0	5	44	N/A	Exit sign	LED Exit	None	N	1	1	5	24	365	0	5	44	0	0	0
259	**GF**	**Electrical Room**	**Parabolic**	**E**	**4'T8**	**3**	**2**	**32**	**S**	**4**	**261**	**0**	**192**	**200**	**C**	**Parabolic**	**4'T8**	**None**	**OS**	**3**	**2**	**32**	**3**	**261**	**0**	**192**	**150**	**0**	**50**	**50**
260	**GF**	**Pump Room**	**Parabolic**	**E**	**4'T8**	**15**	**2**	**32**	**S**	**4**	**261**	**0**	**960**	**1,002**	**C**	**Parabolic**	**4'T8**	**None**	**OS**	**15**	**2**	**32**	**3**	**261**	**0**	**960**	**752**	**0**	**251**	**251**
261	GF	Lab	Parabolic	E	4'T8	3	2	32	S	2	261	0	192	100	N/A	Parabolic	4'T8	None	S	3	2	32	2	261	0	192	100	0	0	0
262	GF	Janitor's Closet	Parabolic	E	4'T8	2	2	32	S	2	261	0	128	67	N/A	Parabolic	4'T8	None	S	2	2	32	2	261	0	128	67	0	0	0
263	GF	Men's bathroom	Parabolic	E	4'T8	1	3	32	S	2	261	0	96	50	N/A	Parabolic	4'T8	None	S	1	3	32	2	261	0	96	50	0	0	0
264	GF	Men's bathroom	Parabolic	E	4'T8	1	1	32	N	24	365	0	32	280	N/A	Parabolic	4'T8	None	N	1	1	32	24	365	0	32	280	0	0	0
265	GF	Unisex bathroom	Parabolic	E	4'T8	1	3	32	S	2	261	0	96	50	N/A	Parabolic	4'T8	None	S	1	3	32	2	261	0	96	50	0	0	0
266	**GF**	**Unisex bathroom**	**Parabolic**	**E**	**4'T8**	**1**	**1**	**32**	**N**	**24**	**365**	**0**	**32**	**280**	**C**	**Parabolic**	**4'T8**	**None**	**OS**	**1**	**1**	**32**	**18**	**365**	**0**	**32**	**210**	**0**	**70**	**70**
267	**GF**	**Locker room**	**Parabolic**	**E**	**4'T8**	**3**	**2**	**32**	**S**	**4**	**261**	**0**	**192**	**200**	**C**	**Parabolic**	**4'T8**	**None**	**OS**	**3**	**2**	**32**	**3**	**261**	**0**	**192**	**150**	**0**	**50**	**50**
268	GF	Locker room	Exit sign	None	LED Exit	1	1	5	N	24	365	0	5	44	N/A	Exit sign	LED Exit	None	N	1	1	5	24	365	0	5	44	0	0	0
269	GF	Locker room bathroom	pin-based	E	CFL	1	3	40	N	4	261	0	120	125	N/A	pin-based	CFL	None	N	1	3	40	4	261	0	120	125	0	0	0
270	**GF**	**Locker room bathroom**	**Parabolic**	**E**	**4'T8**	**1**	**1**	**32**	**N**	**24**	**365**	**0**	**32**	**280**	**C**	**Parabolic**	**4'T8**	**None**	**OS**	**1**	**1**	**32**	**18**	**365**	**0**	**32**	**210**	**0**	**70**	**70**
271	GF	Main office	Parabolic	E	4'T8	5	3	32	S	12	261	0	480	1,503	N/A	Parabolic	4'T8	None	S	5	3	32	12	261	0	480	1,503	0	0	0
272	GF	Conference Room	Parabolic	E	4'T8	4	4	32	S	6	261	0	512	802	N/A	Parabolic	4'T8	None	S	4	4	32	6	261	0	512	802	0	0	0
273	GF	Conference Room	pin-based	E	CFL	2	1	26	S	6	261	0	52	81	N/A	pin-based	CFL	None	S	2	1	26	6	261	0	52	81	0	0	0
274	GF	Office #1	Parabolic	E	4'T8	2	4	32	S	10	261	0	256	668	N/A	Parabolic	4'T8	None	S	2	4	32	10	261	0	256	668	0	0	0
275	GF	Office #2	Parabolic	E	4'T8	2	4	32	S	10	261	0	256	668	N/A	Parabolic	4'T8	None	S	2	4	32	10	261	0	256	668	0	0	0
276	**GF**	**File rm**	**Parabolic**	**E**	**4'T8**	**2**	**4**	**32**	**S**	**12**	**261**	**0**	**256**	**802**	**C**	**Parabolic**	**4'T8**	**None**	**OS**	**2**	**4**	**32**	**9**	**261**	**0**	**256**	**601**	**0**	**200**	**200**
254	Ext	Exterior	Exterior	E	CFL	4	2	15	PC	10	365	0	120	438	N/A	Exterior	CFL	None	PC	4	2	15	10	365	0	120	438	0	0	0
Totals:						**74**	**52**	**648**	**0**				**5,501**	**11,624**						**74**	**52**	**648**				**5,501**	**10,599**	**0**	**1,025**	**1,025**

Appendix B: Third Party Energy Suppliers (ESCOs)

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