



Town Of Rye

2011 Municipal Energy Report

Compiled by
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May 17, 2012



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In April 2011 and 2012, the Rye Board of Selectmen renewed the charge of the Rye Energy Committee (REC), originally formed in 2007. Following are some of the REC’s responsibilities which are relevant to this report:

1. *To assess current energy use by Town of Rye municipal activities based on currently available information provided by Town staff.*
2. *To evaluate energy conservation and air emission reduction practices recommended by utilities and Federal agencies, and in use by other municipalities, which may be applicable to the Town of Rye operations.*

And, at the completion of its mission, the Rye Energy Committee will provide a brief report with recommendations.

This report represents an inventory and analysis of the energy use and greenhouse gas emissions of the municipal sector of Rye for the year 2011. The purpose of this report is to assess current energy use, assist in prioritizing energy-saving projects, and to track energy reduction progress. This report does not address residential, commercial, or industrial energy use.

Energy Inventory and Analysis Background

The inventory is based on data gathered by the REC with the assistance of municipal staff. Data came from monthly electricity bills from Public Service of New Hampshire (PSNH), from each building’s heating fuel deliveries, and from the vehicle fuel use of the municipal fleets. This data was analyzed using three software and online tools, as below.

Software/Online Tool	Developed by	Results
Small Town Carbon Calculator (STOCC)	Clean Air-Cool Planet & Univ. of New Hampshire	Overall energy use, costs, and greenhouse gas emissions for buildings, vehicles, and streetlights for one year (2011)
Portfolio Manager	EPA	Detailed building energy analysis useful for evaluating energy performance and comparing buildings over multiple years
Excel	Microsoft	Other trend graphs and pie charts

Rye Budget Centers

A municipal overview and a community profile of Rye are given in Appendix A. The town of Rye has six separate and/or overlapping budget centers. There are three tax precincts: the Rye Water Precinct, Rye Beach Village Precinct, and the Jenness Beach Precinct. These tax precincts pay the same base tax rate for shared town services with a precinct-specific tax added on. The remaining three budgets include the Rye School District, the Water District, and the Sewer District. The Rye School District is funded through a portion of the base tax rate paid by the precincts. The Water District is completely self-supported through customer charges based on usage. The Sewer District is also supported through customer charges, but does receive some support from the town.

In order to make this report more useful to the various budget managers in town, two iterations of the STOCC software were run. The main body of this report is concerned with the overall municipal sector as detailed in Table 1. The second iteration, in Appendix B, shows the overall energy use results for the portion of town overseen by the Selectmen. The overall energy analysis for the entire municipal sector is important in that the precincts and districts may benefit from working together should they decide to move forward on energy efficiency or conservation projects.

The REC wishes to express their appreciation to all town staff and commissioners who provided the data for this report, shown in right-most column of Table 1. We are also grateful for the support of Town Administrator Mike Magnant, who smoothed the way when necessary.

Table 1 outlines the districts and buildings covered by this report, the type of energy used, and the board or commission responsible for each area.

Table 1: Rye Precincts and Districts and the Type of Energy Used

District or Building	Type of Energy Used	Overseen by	Data From
Rye Water Precinct	8 buildings* using electricity and heating oil or propane; gasoline and diesel vehicles; area lights; 9 streetlights	Board of Selectmen	Cindy Gillespie (electricity, fuel use); Dennis McCarthy (vehicles, outdoor lights); Andy Richmond (Rye Public Library)
Rye Beach Village Precinct	Electricity and heating oil for Precinct Office, 3 streetlights, 68 post lights lining streets	Rye Beach Village District Board	Tyson Dines, treasurer
Jeness Beach Precinct	69 streetlights	Jeness Beach District Board	Randy Crapo
Water District	Electricity and propane for office, 3 gasoline trucks, electricity for area lights and pumping water	Water District Commission	Ralph Hickson
Sewer District	Propane for pump houses, electricity for pumping	Sewer Commission	Lee Arthur
Rye Elementary and Jr. High Schools	Electricity, heating oil, and propane	Rye School Board/SAU50	Jim Katkin, Business Administrator

*The eight buildings in the Rye Water Precinct included in this report are the Town Hall, the Public Safety Building, the Public Works Garage, the Recycling Center, the Swap Shop, the Recreation Complex, the Soccer Snack Shack, and the Rye Public Library.

Rye Overall Energy Use

The STOCC calculator provides an overall energy snapshot for one year, in this case the calendar year 2011. It divides Rye’s energy use, cost and carbon emissions into three main municipal sectors: Buildings, Vehicles, and Streetlights. Each of these sectors uses energy as follows:

- **Buildings (and Operations)**
 - Electricity use
 - Heating fuel use, oil and/or propane
 - Electricity for Water District and Sewer District pumping
- **Vehicles**
 - Gasoline for cars and trucks
 - Diesel for cars and trucks
- **Streetlights (and other outdoor lights) – Electricity for**
 - Streetlights
 - Area lights
 - Parking lot lights
 - Pedestrian flashers at crosswalks

All kilowatt-hours of electricity and gallons of oil, propane, gasoline, and diesel were converted to a common unit of energy, MMBtu (million British Thermal Units), for direct comparison.

Table 2 shows the overall energy cost, energy use, and greenhouse gas emissions for the entire municipal sector of Rye. During 2011, Rye spent \$424,273 on 15,029 MMBtu of energy and emitted 2,711,853 pounds of carbon dioxide, the major greenhouse gas.

Table 2: 2011 Energy Use, Cost, and Carbon Emissions, by Municipal Sector

Summary Report							
	Buildings		Vehicles		Streetlights		
	#	% of total	#	% of total	#	% of total	Grand Total
Annual Fuel Expense	\$319,774	75%	\$79,849	19%	\$24,650	6%	\$424,273
Annual CO2 Emissions (lbs)	2138720	79%	518881	19%	54252	2%	2711853
Annual Energy Use (MMBtu)	11556.9	77%	3272.5	22%	199.5	1%	15028.9

Figures 1 through 3 show the classification by sector for 2011.

Figure 1: Municipal Energy Cost by Sector

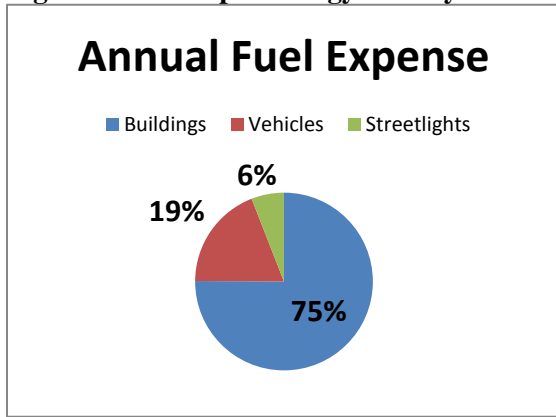


Figure 2: Municipal Carbon Emissions

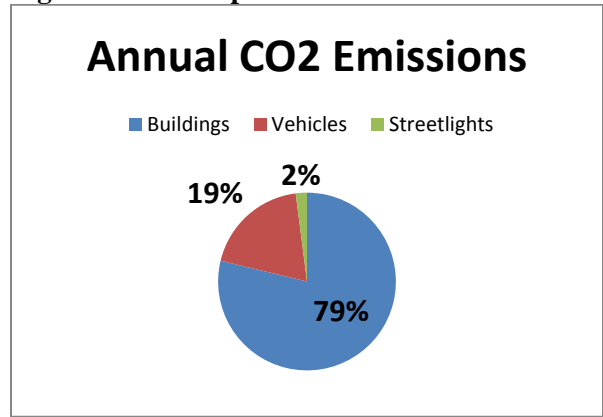
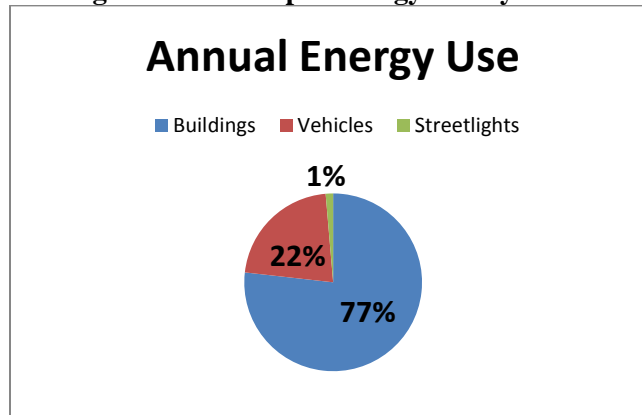


Figure 3: Municipal Energy Use by Sector

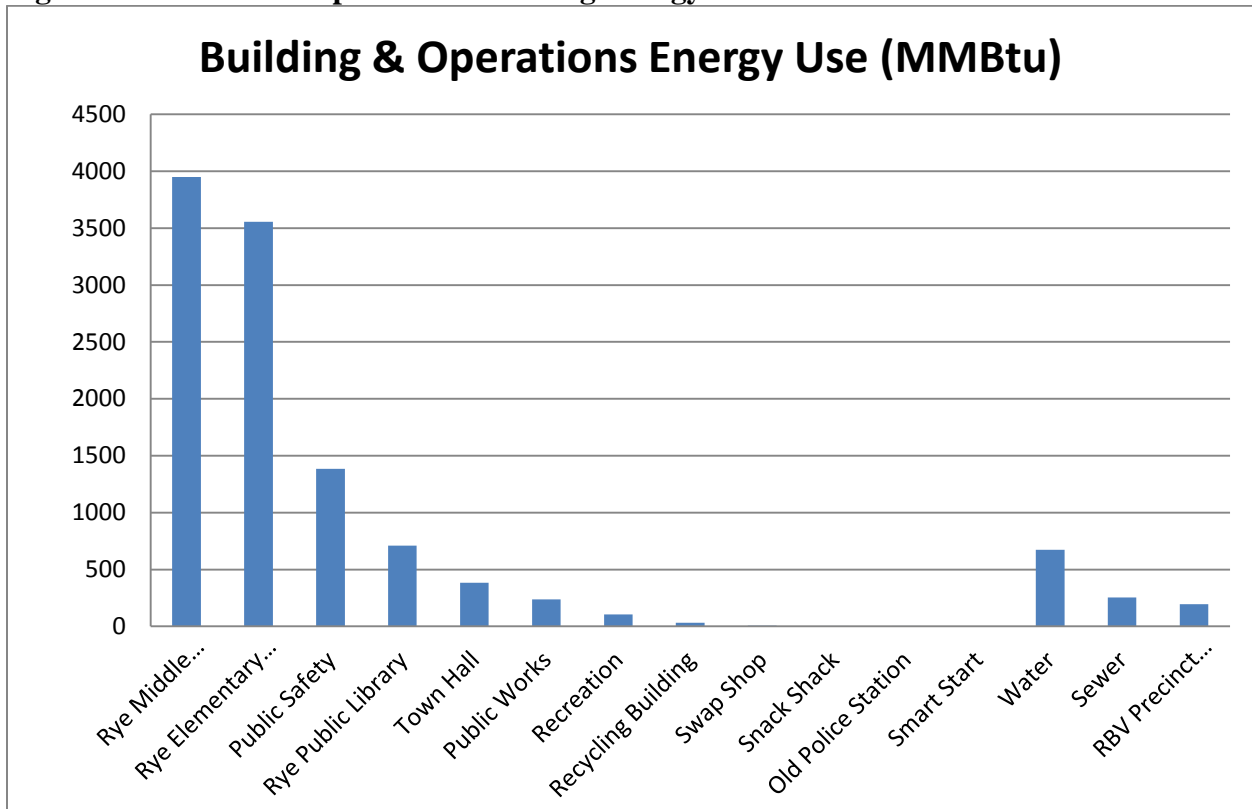


Buildings and Operations

The above Figures show that by a large margin, the buildings in Rye account for the greatest energy use, cost, and carbon emissions. For this reason, the highest priority should be placed on making Rye's buildings more energy efficient. Figure 4 compares the energy use of the Rye municipal buildings and operations using the STOCC calculator.

Rye Junior High School and Rye Elementary School, the largest buildings in town, dominate the chart in Fig. 4. Because they account for the largest total energy usage and cost, the schools should be top priority for intensive energy efficiency work. In 2011 approximately \$280 per student for Rye Elementary and \$430 per student for Rye Junior High went toward energy costs.

Figure 4: STOCC Comparison of Building Energy Use



EPA Portfolio Manager (PM) is an online, interactive tool that allows users to track and analyze energy consumption of a portfolio of buildings over a period of years. It also provides a more detailed analysis of building energy use than STOCC. The seven buildings with the highest energy use are currently entered into PM using the data shown in Table 3. It is a requirement of the Energy Efficiency and Conservation Block Grants (EECBG) awarded to the town of Rye that the buildings receiving grants be tracked using PM.

Table 3: EPA Portfolio Manager Inventory

Building	Size (ft ²)	Year Built (Additions)	Portfolio Manager Category	Fuel Types
Rye Elementary School	50,467	1957 (1965, 1996)	K-12 School	electricity, oil, propane* not entered
Rye Junior High School	52,155	1933 (1949, 1965, 1996)	K-12 School	Electricity, oil, propane* not entered
Rye Public Library	11,097	c. 1911 (c. 1998)	Other - Library	Electricity, oil
Rye Town Hall	5642	1846 (1890, 1980)	Office	Electricity, oil
Public Safety	19,818	2006	Other – Fire Station/Police Station	Electricity, oil
Public Works	6596	1981	Other – service (DPW Garage)	Electricity, oil
Recreation Complex (Building, trailer, announcer’s booth, baseball snack shack)	2452	1989, 1999	Other - Recreation	Electricity, propane

*Propane usage is not entered in Portfolio Manager due to incomplete records for cost. Usage is 350-450 gal/yr.

While examination of Total Energy Use from Fig. 4 informs us which buildings use the most energy in town, the Energy Intensity, a measure of energy used per square foot, gives an idea of how efficient each building is. Portfolio Manager adjusts the Energy Intensity for weather and compares it to other buildings of the same type. For example, the Library is compared to other libraries, the schools are compared to other K-12 schools, and the Town Hall is compared to other offices. **Site Energy Intensity** is the amount of energy expended to heat, cool, and electrify the floor area of a building - the gallons of oil and the kilowatt-hours of electricity shown on the monthly bills. This measurement fluctuates directly with how much energy is being used, such as how thermostats are set, how much lighting is used, and how well-insulated and sealed the building is. Site Energy Intensity can be lowered through actions such as lowering a thermostat at night or through motion-sensor lighting. **Source Energy Intensity** refers to the amount of energy expended per floor area based on the type of fuel used and the efficiency of that fuel type. It includes the energy required to produce and transport the electricity or fuel. For example, the electricity purchased from the grid is inefficient; the producing facility has to make about 3 kilowatts of electricity in order to deliver 1 kilowatt to the end user. Measures to reduce source energy intensity could include changing the type of fuel used or producing energy onsite from renewable sources, such as solar, wind, geothermal or biomass systems.

PM provides several metrics for comparing building energy consumptions, presented in Table 4, ranked by Total Energy Use.

Table 4: Building Energy Performance Comparison

Building Name	Total Energy Use (kBtu)	Current Site Energy Intensity (kBtu/ft²)	Current Source Energy Intensity (kBtu/ft²)	Difference from National Median Source EUJ	Annual Energy Cost	Energy Cost/ft²	Total Greenhouse Gas Emissions (MtCO₂e)
Rye Elementary School	3,353,040	66	111	-23%	\$85,455	\$1.69	282
Rye Junior High School	3,945,766	73	107	-24%	\$90,747	\$1.69	318
Public Safety	1,380,876	70	130	-11%	\$37,010	\$1.87	120
Rye Public Library	710,556	57	103	-58%	\$19,082	\$1.58	61
Town Hall	401,765	67	112	-13%	\$11,282	\$1.87	34
Public Works	245,660	37	79	-18%	\$8,762	\$1.33	22
Recreation	106,180	49	70	-29%	\$3,824	\$1.77	8

Energy Performance Measurement Definitions:

- Site Energy Intensity – amount of energy expended per square foot to heat, cool, and electrify the building.
- Source Energy Intensity – amount of energy expended per square foot based on the type of fuel used and the efficiency of that fuel type.

- Difference from National Median Source EUI – difference from the national median source energy intensity for that particular building type, eg. the library is compared to other libraries. Negative values show lower energy intensity than the national median.
- MtCO₂e – metric tons of carbon dioxide equivalent. This common unit allows emissions of different types of greenhouse gases to be added together.

All of the town buildings shown in Table 4 are performing well compared to the national median source energy intensity for their building type; they all use less energy than the national median. However, the Town Hall and the Public Safety Complex are the least efficient buildings when considering source energy intensity and cost per square foot (see Figs. 5-7). Aside from the schools, which use the most total energy, the Town Hall and the Public Safety Complex should be the next priorities for energy projects due to the fact that they are the least efficient buildings. Because the Public Safety Building also has a high Total Energy Use, it should be targeted first.

Fig. 5: Site Energy Intensity Compared to National Median for Same Building Type

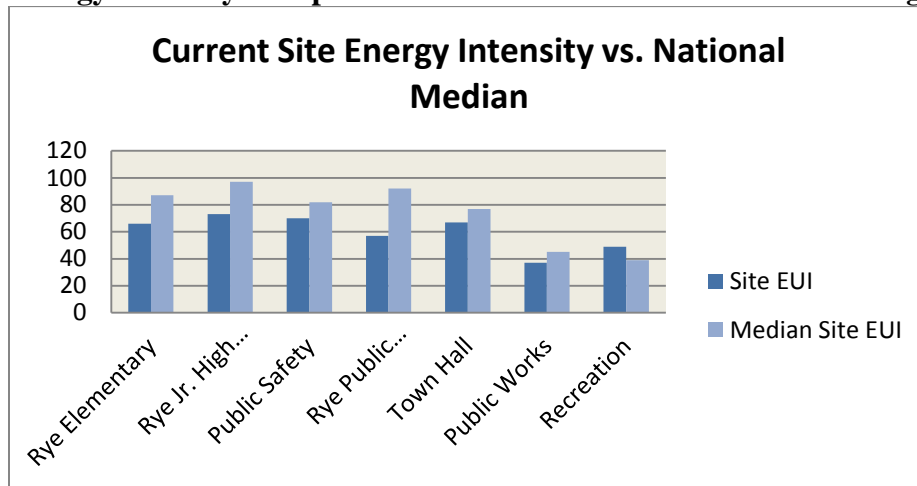


Fig. 6: Source Energy Intensity Compared to National Median for Same Building Type

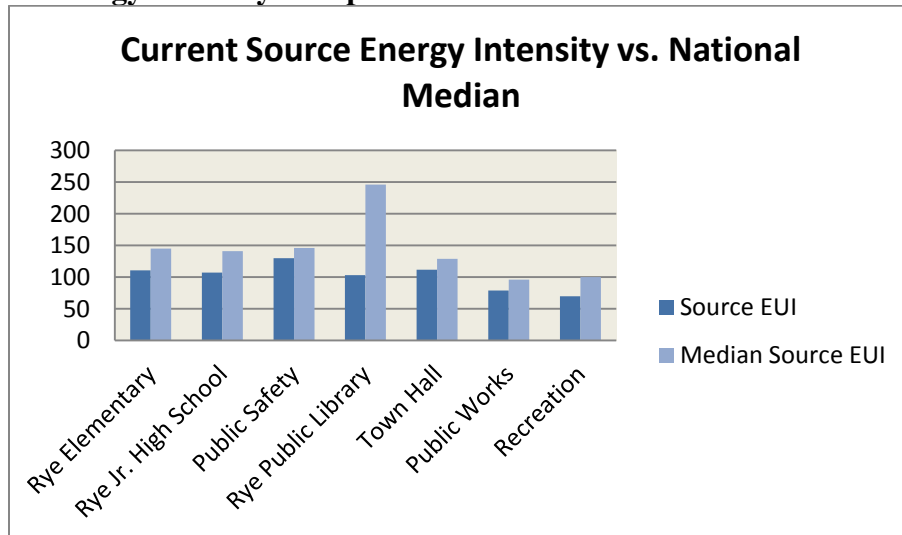
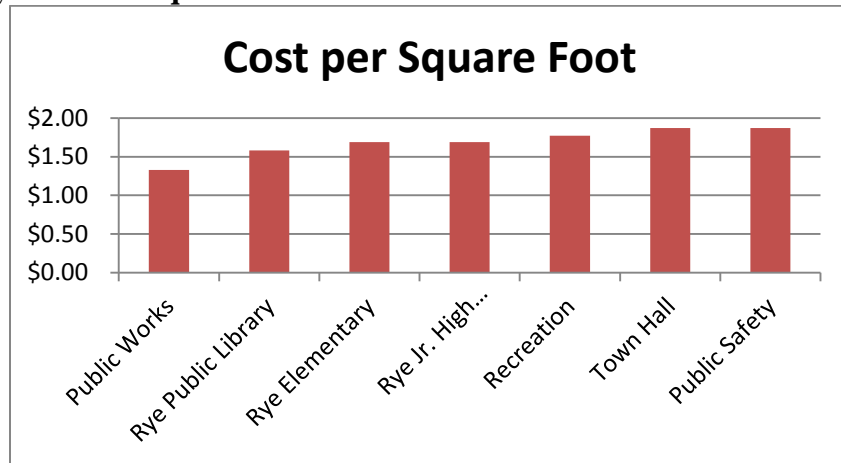


Fig. 7: Energy Cost Per Square Foot



These same seven buildings that are tracked in PM have had energy audits done, as shown in Table 5. The audits recommend lighting upgrades and controls, HVAC system upgrades and controls, and building envelope improvements to achieve significant energy usage reductions. These actions are first steps to improve the efficiency of buildings, but the potential savings can be quite high. The next step in energy efficiency would be to install some type of renewable energy onsite, such as solar electric panels, a solar thermal system, a biomass system or a geothermal system. Renewable energy systems have high initial costs, but these costs can sometimes be offset by savings realized through first-step actions such as those recommended in the audits.

Table 5: Energy Audits Performed on Rye Municipal Buildings

Date	Building	Audit Level	Performed by	Minimum Potential Savings
2008	Rye Elementary and Rye Jr. High Schools	Comprehensive	Jordan Institute, Inc.	55%
2009	Rye Public Library	Comprehensive	anix – Tim Nichols	61%
2009	Public Works	Comprehensive	anix – Tim Nichols	28%
2009	Rye Recreation	Comprehensive	anix – Tim Nichols	16%
2009	Town Hall	Comprehensive	anix – Tim Nichols	31%
2011	Town Hall (weatherization)	Level 3 – Detailed Analysis	Lakes Region Thermal Scan	53% (fuel)
2011	Public Safety Complex	Decision Grade - Preliminary (Level 1)	Sustainable Development & Energy Systems (SDES)	30%

Some of the work recommended by the audits has been completed, as shown in Table 6, but the audits detail much more that needs to be done to achieve the savings shown in Table 5. Table 6 shows the energy savings achieved as of December 2011, as calculated by Portfolio Manager. These results are adjusted for weather.

Table 6: Energy Savings through December 2011 Compared to Baseline Year

Building	Baseline Year	Energy Projects Completed	Energy Savings from Baseline
Rye Jr. High	2005	Ceiling insulation, gym lights, occupancy sensors	12.1%
Rye Elementary School	2005	New Boiler and controls, gym lights & occupancy sensors, building envelope improvements	12.6%
Rye Public Library	2007	Lighting, Ceiling Insulation	22.2%
Town Hall	2007	Lighting, Refrigerator	21.6%
Public Safety Complex	2008		1.0%
Public Works	2009	Lighting	-21.6%
Recreation	2009	Lighting, lowered thermostat, changed furnace filters, behavior – turn off lights	23.7%

All of the town buildings, except for Public Works, have realized significant energy savings as a result of the energy projects completed in the past few years. The high Public Works energy usage was due to the temporary use of some infrared heaters in early 2011, which greatly increased electricity use. Public Works Director Dennis McCarthy has disallowed further use of the heaters.

Appendix C contains trend charts for some of the Rye buildings. Scrutiny of these charts can sometimes give insight into areas for energy savings.

Financing Building Energy Projects

Significant energy savings have already been achieved in the municipal buildings, but there is much more that can be realized. When considering efficiency projects, the first call should be made to PSNH, which has several substantial incentive programs for upgrading lighting, HVAC equipment, appliances, and the building envelope. The town may want to investigate working with an Energy Service Company (ESCO) to leverage all financial incentives available for accomplishing efficiency and conservation projects. Two ESCO companies that other smaller NH towns have used are LighTec and Johnson Controls. The REC also has knowledge of incentive programs in the state and would be willing to work with the town to prioritize energy projects and to procure funding.

Several New Hampshire towns have had success using performance contracts, such as a Guaranteed Savings Agreement, allowed according to NH law 21-1:19d. Tax-Exempt Lease-Purchase Agreements are also allowed according to NH law 533 A 2d 37 (NH 1987). Several NH towns have set up revolving funds, in which energy savings from one project are used to fund a future energy project and so on. The town of Hampton Falls will use the savings generated from installing a cogeneration unit and solar hot water system in their Public Safety Building through an EECBG grant to fund their next energy-saving projects.

<http://www.hamptonfalls.org/energy.htm>).

Potential funding sources are:

- Pay 4 Performance – up to \$300,000, schools and Public Safety only, <http://nhp4p.com/>
- PSNH Programs – up to 50% for energy efficiency and renewable energy projects, also pay-with-your-savings programs, www.psnh.com
- QECBs – Qualified Energy Conservation Bonds, federally subsidized bonds: \$3.1 million available in Rockingham County, http://www1.eere.energy.gov/wip/pdfs/qecb_creb_primer.pdf
- Revolving Loan Funds, such as NH Community Loan Fund, <http://communityloanfund.org/>
- Specialty Lenders – consult NH Business Resource Center
 - Capital Regional Development Council, <http://www.crdc-nh.com/>
 - Community Development Finance Authority, <http://www.nhcdfa.org/>
 - Private companies, eg. Environmental Energy Finance Council (renewable energy), <http://eefcenergy.com/about-us/>
 - Property-Assessed Clean Energy (PACE) Commercial, http://www1.eere.energy.gov/wip/pdfs/commercial_pace_primer.pdf
 - Program Related Investment (PRI) through a foundation such as NH Charitable Foundation, <http://foundationcenter.org/>

Several of these lenders offer 0% interest or very low interest rates for energy projects. In some cases, these sources of funds can be combined, eg. Pay 4 Performance plus PSNH incentives would cover 75%, plus a low-interest loan to cover the balance.

Operations - Water Pumping

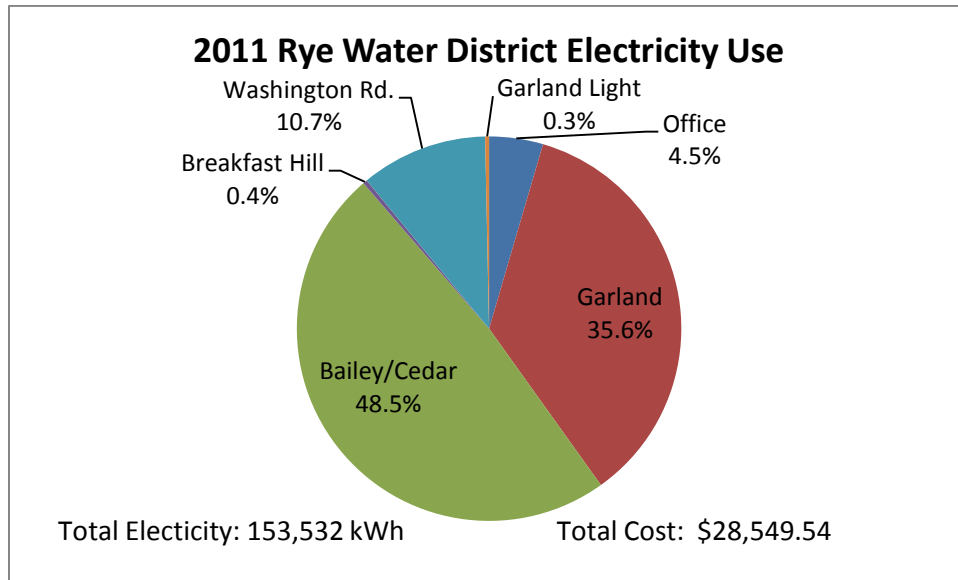
Pumping water is energy intensive. The Water and Sewer Districts used energy in 2011 as shown in Table 7 (Water District gasoline use is detailed in the Vehicles section of this report). Aside from prompt repair of leaks and public education on water conservation measures, recommended ways to save energy when pumping water are using correct pump sizing, variable speed drives, and brushless DC motors. Investigate PSNH and state programs for technical and financial assistance in this area. Propane use by the Water and Sewer Districts can be minimized by improving the insulation and reducing the air leakage of the Water office and Sewer pumphouses.

Table 7: Rye Water/Sewer Energy Usage

	Propane	Electricity	CO2 Emissions	Total Annual
Service	(gal.)	(kWh)	(lbs)	Cost
Water District electric		153,532	127,117	\$28,549.54
Water District heat	1644		20,827	\$4,260.00
Sewer District Pumps		55,652	46,077	\$8,406.50
Sewer Pumps - heat	716		9,072	\$2,452.00
TOTALS	2360	209,184	203,093	\$43,668.04

Water District electricity accounts for the highest energy use in Table 7. Figure 8 shows that nearly 95% of Water District electricity use is for pumping by the Garland Road pumps, the Bailey Brook/Cedar Run pumps, and the Washington Road booster pump.

Fig. 8: Rye Water Electricity Use



Vehicles

The municipal fleet accounts for a significant portion of energy use in town. Figure 9 shows the gasoline and diesel vehicle costs by department. As expected, Public Works and the Police vehicles consume the largest amounts of fuel in town, with the Water District also using a significant amount of gasoline for its trucks.

Figure 9: 2011 Rye Municipal Vehicles Energy Cost by Department

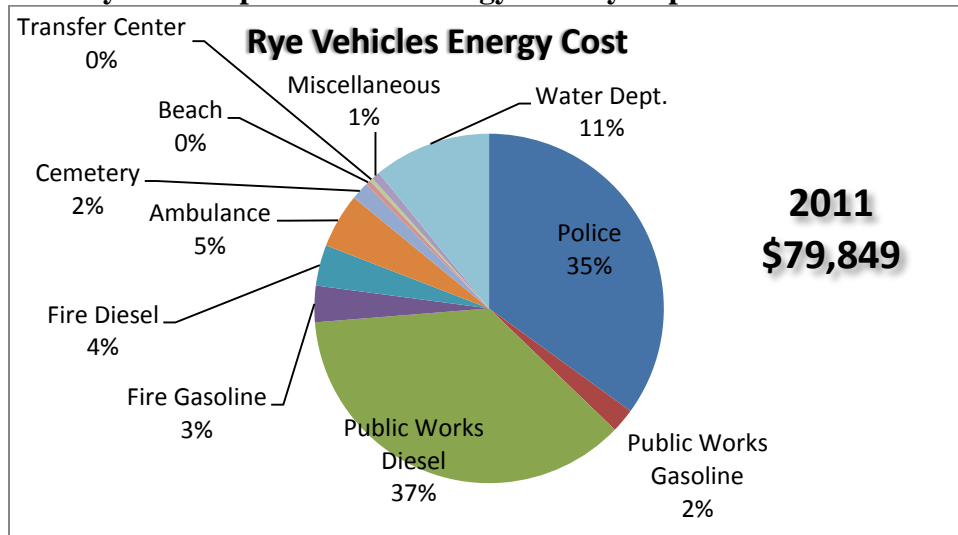


Table 8 details the vehicle fuel usage and cost by department.

Table 8: 2011 Municipal Vehicle Fuel Use and Cost

Department	Gallons Used	Annual Cost
Police - gas	8817	\$27,940
Public Works - gasoline	559	\$1772
Public Works - diesel	8810	\$29,161
Fire - gasoline	847	\$2685
Fire - diesel	911	\$3015
Ambulance - diesel	1219	\$4037
Cemetery - gas	416	\$1319
Beach - diesel	116	\$383
Transfer Center - diesel	75	\$247
Miscellaneous - gas	192	\$609
Water District - gas	2956	\$8681
Total Cost		\$79,849

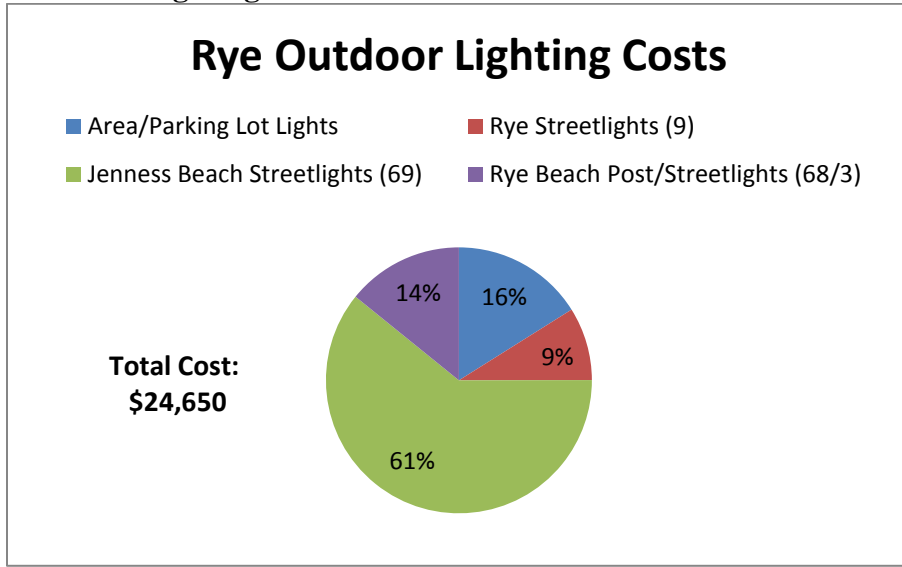
See the Recommendations Section at the end of this report for suggestions on reducing fuel costs for the municipal fleet.

Streetlights

All Rye outdoor lighting is covered within the Streetlight Category in the STOCC software, including streetlights, post lights, area and parking lot lights, and pedestrian flashers at crosswalks. In 2011 Rye spent \$24,650 on outdoor lighting. While the cost, use, and emissions of outdoor lighting in Rye are far lower than the Buildings and Vehicles sectors, there are financial incentive programs offered through PSNH that will reduce electricity use by at least 30-50%. The towns of North Hampton and Hampton are currently undertaking large streetlight projects, which are expected to result in significant savings for the towns http://www.northhampton-h.gov/Public_Documents/NorthHamptonNH_BComm/Energy.

In North Hampton they have determined that streetlights are only required for safety reasons at intersections and curves in the road, but not on straight sections of road. In the main part of Rye there are only 9 streetlights and a few parking lot lights and area lights, but there is a high concentration of lights in the Beach Precincts. In the Jenness Beach Precinct, there are 69 streetlights lining the streets, and in the Rye Beach Precinct there are 68 decorative post lights lining all the streets in addition to three streetlights. Fig. 10 shows the cost distribution for lighting in Rye.

Fig. 10: Rye Outdoor Lighting Costs



The Rye Planning Board advocates “Dark Sky”, or fully-shielded, outdoor lighting in the Master Plan. Dark Sky lighting minimizes glare and light pollution by directing light only where it needed – downward. It not only contributes to a more rural character in town and is less disruptive to wildlife, but it helps preserve a view of the night sky. Of course, it also cuts energy waste. Nighttime satellite photos of New Hampshire show the highest concentrations of light along the Route 93 corridor and along the seacoast. Due to the high concentration of lights in the Jenness Beach and Rye Beach Precincts, the residents of these areas may wish to consider switching to more efficient, shielded dark-sky friendly fixtures or eliminating some of the fixtures.

PSNH Rates for Outdoor Lighting

Most streetlights, parking lot lights, and area lights in Rye are on the PSNH OL All Night rate. The OL rate is analogous to a rental charge for each light, standardized based on the type of lamp and the month of the year, charged whether the light is working or not. PSNH offers the following rates for outdoor lighting, in descending order of cost:

- OL All Night – Outdoor Lighting rate, on all night
- OL Midnight Option– Outdoor Lighting, off at midnight
- EOL All Night – Energy Efficient Outdoor Light, on all night
- EOL Midnight Option – Energy Efficient Outdoor Light, off at midnight

Here is a comparison of these rates per year for the most common type of streetlight in town, a 3500-lumen mercury lamp, with its more efficient counterpart, a 4000-lumen HPS lamp.

Type	Lumens	Watts	OL	OL-Mid	EOL	EOL-Mid
Mercury	3500	100	\$207.66	n/a	n/a	n/a
HPS	4000	50	\$200.04	\$185.39	\$119.28	\$104.63

Neighboring North Hampton, with an annual streetlight bill of approximately \$20,000, has upgraded all of their streetlights to the EOL rate.

See Appendix D for a chart of all PSNH rates, including the Outdoor Lighting rates.

Outdoor lighting is available in the following types, in increasing order of energy efficiency:

- Incandescent
- Mercury
- Metal Halide (white) or High Pressure Sodium (yellow)
- LED

All outdoor lighting in Rye is of the first three types. In order to switch to the lower EOL rate, all streetlights must be Metal Halide or High Pressure Sodium. Next year, the utility expects to also add LEDs to the EOL program. LEDs can last 20 years and use 90% less electricity.

The **Rye Water Precinct** has 11 PSNH accounts for metered lights charged according to Rate G, 1 Phase. These lights are used for area lighting in parks, parking lots, and pedestrian crosswalks on Ocean Boulevard. There is an additional account for nine streetlights on the OL rate. All of these lights are mercury, High Pressure Sodium and Metal Halide. An 11,000 lumen Mercury light at the Town Hall and a 36,000 lumen Metal Halide light on Recreation Road should be upgraded as soon as possible due to their high wattage.

The **Jenness Beach Precinct** has one PSNH account, which charges for 69 streetlights on the OL rate, 57 of which are Mercury lights. Not only are mercury lights now considered hazardous waste, but there are much more efficient lights available. Jenness Beach will profit the most by switching to the EOL rate.

Rye Beach Village Precinct, where electric lines are underground, has 8 separate PSNH accounts for separate streets or sections of streets. Seven of these accounts are for the 68 post lights lining particular streets. One account is for standard streetlights on Central Rd. Rye Beach outdoor lights are incandescent and HPS.

The REC recommends that all three precincts pursue the EOL rate for their outdoor lights, with preference for the LED lighting program when available next year.

Interestingly, Jenness Beach is paying far more for its 69 streetlights than Rye Beach is paying for its 68 postlights and 3 streetlights, as shown in Figure 9. Although both precincts have similar numbers of lights lining their streets, but Jenness Beach is paying the OL rate, while Rye Beach's post lights are metered by street.

PSNH Accounts

The Rye municipal sector has 32 electricity accounts, comprising 48 different service areas, with Public Service of New Hampshire. See Appendix E for a complete detailed listing of these accounts. There are two types of PSNH accounts in the municipality. Four are Large Power accounts, whose account numbers start with "800". They are:

- the Rye Elementary School,
- 9 Rye streetlights,
- 69 Jenness Beach streetlights,
- 10 Rye Beach Village outdoor lights.

All other electricity accounts are commercial accounts starting with the numbers “56”. Historical usage data and graphs for these “56” accounts are available online via the PSNH website, www.psnh.com. The REC set up an account on this website for the town of Rye so that electricity data would be available to building managers and town administrators. The login information was given to Mike Magnant, Cindy Gillespie, and to the individual building managers.

PSNH Rate Structures

Most of the town administrators, commissioners, and building managers responsible for paying the electricity bills were not aware of the PSNH rate structure for their accounts. Being aware of how charges are calculated can save money. See Appendix E for a listing of all the PSNH accounts in Rye and the PSNH rate for each and Appendix D for a complete listing of PSNH Rate structures as of January 1, 2012.

Most people understand that at home they are charged a monthly customer charge plus a rate per kilowatt-hour (kwh) of electricity used. However, all municipal buildings or equipment paying according to Commercial Rate G pay an extra charge, called a *demand charge*. The demand charge is based on how much electricity is being used at any one time, and it can double the monthly bill in some cases. Commercial meters check the instantaneous electricity demand in kilowatts (kW) every half hour, and the customer is charged for the maximum recorded for that month above 5 kW at a rate of about \$12 per kW.

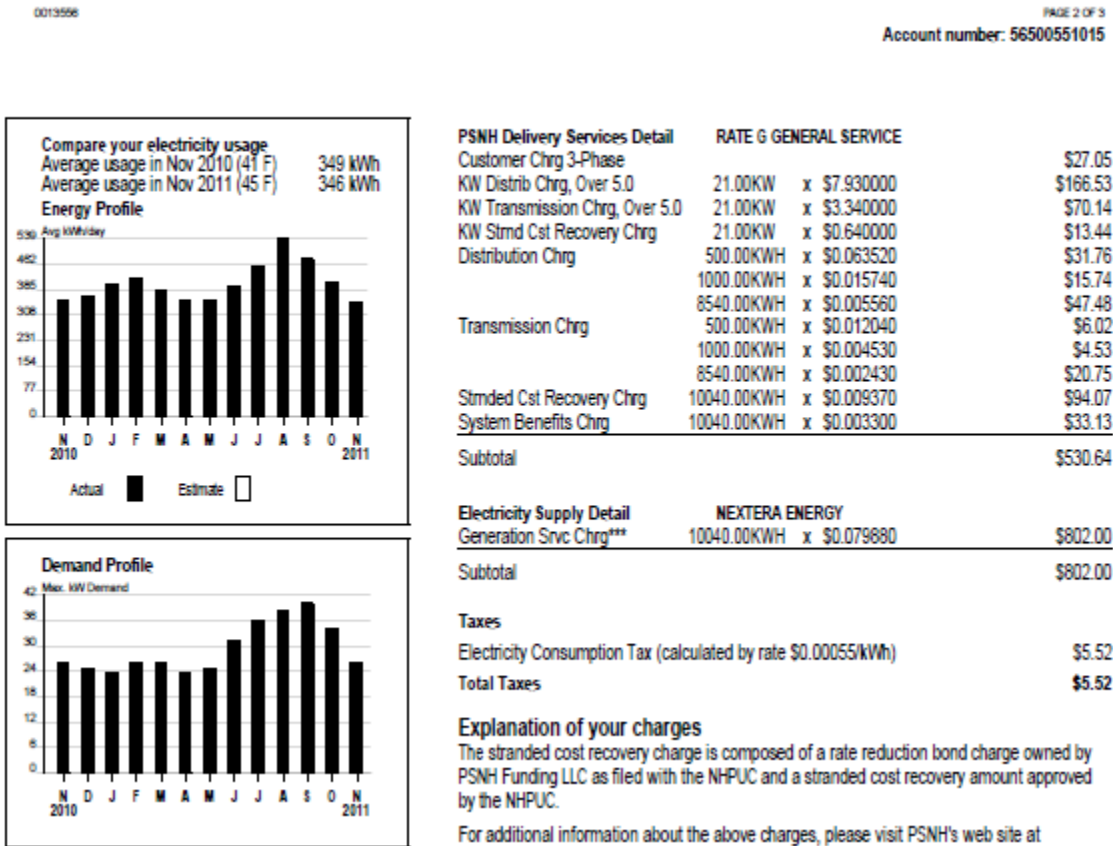
The PSNH rates are adjusted every six months, in June and December of each year. All PSNH accounts paying rate G are charged according the following rate structure:

Table 9: PSNH Rate G Structure

Charge	Rate, Jan. 1, 2011	Rate, Jan. 1, 2012
Customer charge – 1 Phase	\$13.29	\$13.53
Customer Charge – 3 Phase	\$26.58	\$27.05
Demand Charge (over 5 KW)	\$12.80 per KW	\$11.99 per kW
First 500 kWh	\$0.18069 per kWh	\$0.17309 per kWh
Next 1,000 kWh	\$0.12240 per kWh	\$0.11780 per kWh
All Additional kWh	\$0.10936 per kWh	\$0.10552 per kWh

For a Rate G-3 Phase example, let us look at a sample portion of a bill for the Public Safety Building, below.

Figure 11: Sample Portion of PSNH bill for Public Safety Complex



Notice that the Customer Charge for this November, 2011 bill is \$27.05. The highest demand for this month was 26 KW, so the demand charge is based on 26 minus 5, or 21 KW. Out of a total charge of \$802, the demand charge alone was \$250, or 31% of this particular bill. Notice from the lower bar graph on the left that the demand is highest during the warm months, likely due to air conditioners being on at the same time.

During this month Public Safety used 10,040 kWh of electricity, and they were also charged for this usage according to the sliding scale of first 500 kWh at \$0.173 per kWh, next 1000kWh at \$0.117 per kWh, and the remaining 8540 kWh at \$0.105 per kWh.

Minimizing Demand Charge

There are three ways to minimize the demand charge each month:

- **Electronic controls**
Example: Andy Richmond at the Rye Public Library has consulted with his HVAC contractor about staggering the start times of the library's heating and cooling equipment.
- **Behavioral Changes**
Example: Dennis McCarthy has spoken to the Recycling crew about staggering the running of the compactors.
- **Efficient Equipment**

Example: According to the Energy Audit of the Recreation Building performed by anix in 2009,

The beverage refrigerator unit in the Baseball Snack Bar (Photograph 90) consumes a substantial amount of electricity with a measured usage of 4.95-amps – this is more than five times an equivalently sized EnergyStar® refrigerator. Annual energy cost to operate this unit is approximately \$600 – the return on investment to replace this with an EnergyStar® unit would be one year.

Replacement of this refrigerator would not only reduce the demand charge, but also would reduce electricity usage as well.

Recommendations

General

- Complete Small Town Carbon Calculator (STOCC) inventory each year.
- Keep EPA Portfolio Manager accounts for buildings up to date. Individual building managers can do this or the REC can enter the data.
- The REC will give an energy update to the town each year using STOCC and Portfolio Manager charts, graphs, and reports. Building managers will be given a Statement of Energy Performance annually.
- Adopt a policy of energy-conscious decision making and encourage residents and businesses to do the same.
- Adopt an Energy Star procurement policy. Energy Star is a joint effort between the U.S. Dept. of Energy and the EPA to help consumers “save money and protect the environment through energy efficient products and practices” (www.energystar.gov). Energy bills can be substantially reduced through strict use of Energy Star products. Items can be replaced with Energy Star-rated products upon failure. Sometimes it pays to replace a piece of equipment, such as an old refrigerator, before the end of its life. The website lists the energy use by model number of thousands of electrically- and fuel-driven products. A partial listing of items available with the Energy Star rating is shown in the sidebar.

Buildings

- Complete energy projects as specified by the energy audits. The Public Safety Complex should be top priority due to its lower efficiency and high energy use.
- Work under the NH Pay 4 Performance program for the schools and Public Safety Complex. Combine funds from this program with those from PSNH programs and other sources.

Energy Star Products

Refrigerators and freezers

Furnaces, boilers, heat pumps

Air conditioners and dehumidifiers

Computers, printers, copiers, scanners

Light fixtures, light bulbs, and ceiling fans

Clothes washers and dishwashers

Windows, doors, and other building products

Televisions, set-top and cable boxes

Audio/visual equipment

Water heaters

Battery chargers

Room air cleaners

Water coolers

Homes

- Investigate sources of funding as specified in Buildings Section of this report.
- Consider having work done under a performance contract, such as a Guaranteed Savings Agreement. Also consider Tax-Exempt Lease-Purchase agreements.
- Consider working with an Energy Service Company that can perform the auditing, oversee the energy projects, guarantee results, and maximize funding sources.
- Use knowledge of PSNH Rate Structure to minimize demand charges.
- Set up a revolving energy savings fund, in which savings are invested in other efficiency or renewable energy projects.
- Once energy-efficiency is maximized, investigate installation of solar photovoltaic systems on south-facing rooftops. Ideal candidates are the Town Hall, Public Safety, and the schools.
- For all major building renovations and new buildings, consider pursuing a nationally-recognized certification of energy efficiency, such as Energy Star, LEED (Leadership in Energy and Environmental Design), Living Building Challenge, or Passive House certifications.

Vehicles

- Maintain town vehicles. A poorly tuned engine, for example, can increase fuel consumption by 10-20% depending on its condition.
- Keep tires properly inflated and aligned, conduct routine oil changes, and check and replace vehicle air filters. These measures will not only reduce fuel consumption but also will help vehicles to last longer.
- Instruct operators to drive more efficiently. Stay within posted speed limits.
- Avoid unnecessary idling, braking, and acceleration, which can improve fuel economy by 5-10%.
- Combine trips when possible; several short trips taken from a cold start can use twice as much fuel as one trip covering the same distance when the engine is warm.
- Remove excess weight from the vehicle. Carrying an extra 100 pounds reduces fuel economy by 1-2%.
- Develop criteria within the Town's vehicle replacement policy to gradually phase in more fuel efficient or hybrid vehicles.
- Establish an anti-idling policy to encourage municipal fleet users as well as the general public to turn off their engines when the vehicle is not in use. NH state regulations under RSA 125-C:6, XII specify that when temperatures are above 32°F vehicles may not idle for more than 5 minutes. At temperatures between -10F and 32°F vehicles may not idle for more than 15 minutes. Contact the Nashua Green Team for information about the anti-idling policies they put in place for the city.
- The town of Rye and the Water District may consider aggregating their gasoline and diesel purchases to negotiate a lower price.

Outdoor Lighting

- Switch to PSNH EOL rate. This will require upgrading mercury and incandescent fixtures to more efficient lamps. Preference should be given to installing LED lamps due to their long life and high efficiency.

- Use efficient and fully shielded “dark sky” fixtures for all outdoor lighting to minimize glare and light pollution, protect wildlife, and cut energy waste.
- The Jenness Beach and the Rye Beach Village Precincts may want to consider reducing the number of streetlights and post lights lining their streets to those required for safety only.
- Use outdoor lighting only where necessary for safety.

Water and Sewer Pumping

- Detect and promptly repair leaks
- Use correctly sized pumps.
- Modulate flow rate with variable frequency drives
- Use efficient motors, such as brushless DC motors.
- Educate customers on differences in seasonal flow rates and how to conserve water.

Appendix A

Rye Municipal Overview

Municipal Overview

Town population: 5298, 2010 census, from NH OEP

Population growth since 2000: 2.2%

Area of municipality: 12.6 square miles

Population density: 420.5 persons per sq. mile

Number of municipal buildings:

Rye Water Precinct: 8

Rye Beach Village Precinct: 0.5

Jeness Beach Precinct: 0

Rye School District: 2

Rye Water District: 1

Rye Sewer District: 0

Number of vehicles in fleet: 35

Number of streetlights:

Rye Water Precinct: 17 + 4 flashers

Rye Beach Village: 68 post, 3 street

Jeness Beach Precinct: 69

Rye School District: 1

Rye Water District: 1

Rye Sewer District: 0

Municipal budget in 2011: \$8,870,748

Total municipal energy cost in 2011: \$424,273

Total municipal energy use in 2011: 15,029 MMBtu, or 15 billion Btu

Total municipal CO2 emissions in 2011: 2,711,853 lbs.

Community Profile

The town of Rye is on the coast in Rockingham County. It is bordered by New Castle, Portsmouth, Greenland, and North Hampton. Rye is the only town in New Hampshire with Atlantic islands, having annexed four of the Isles of Shoals islands. Rye had 5298 residents in 2010, which ranked it 64th among New Hampshire's incorporated cities and towns.

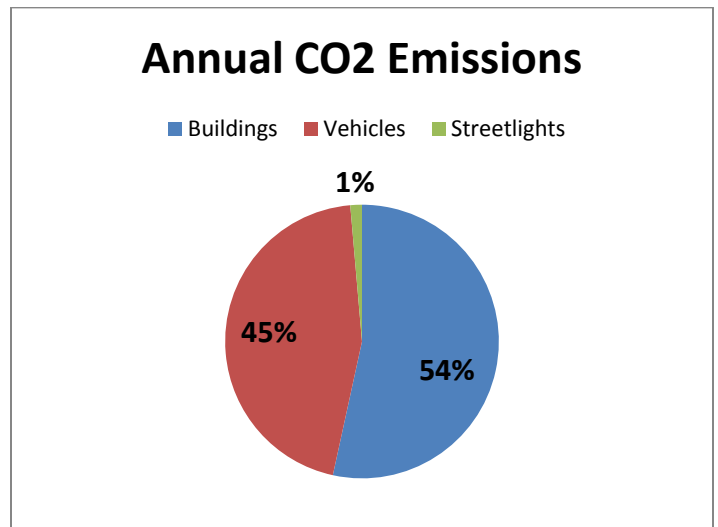
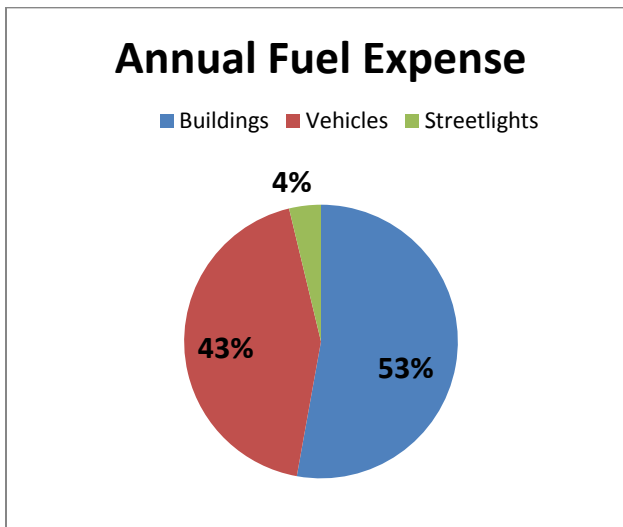
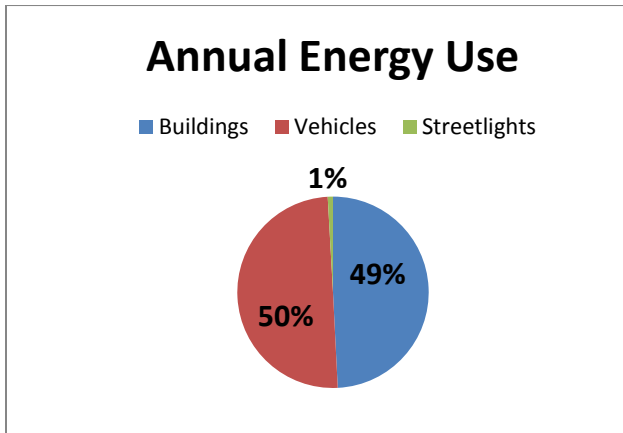
Rye has a number of elected Boards and Commissions, including the Board of Selectmen, the Planning Board, Sewer Commission, Zoning (after 2012) and Budget Committee. Other Commissions include Conservation, Heritage, Historic District, Recreation, Sewer, Mosquito, and Beach. Districts include Rye Water District (water operations), Rye Beach Village, and Jeness Beach Village. There are two committees: Rye Energy Committee and the Capital Improvements Program Committee. The town Master Plan was adopted in 2007, amended in 2009, and is currently under revision. The Planning Board is eager to add an Energy Chapter to the Master Plan and is working with the Rye Energy Committee to develop it.

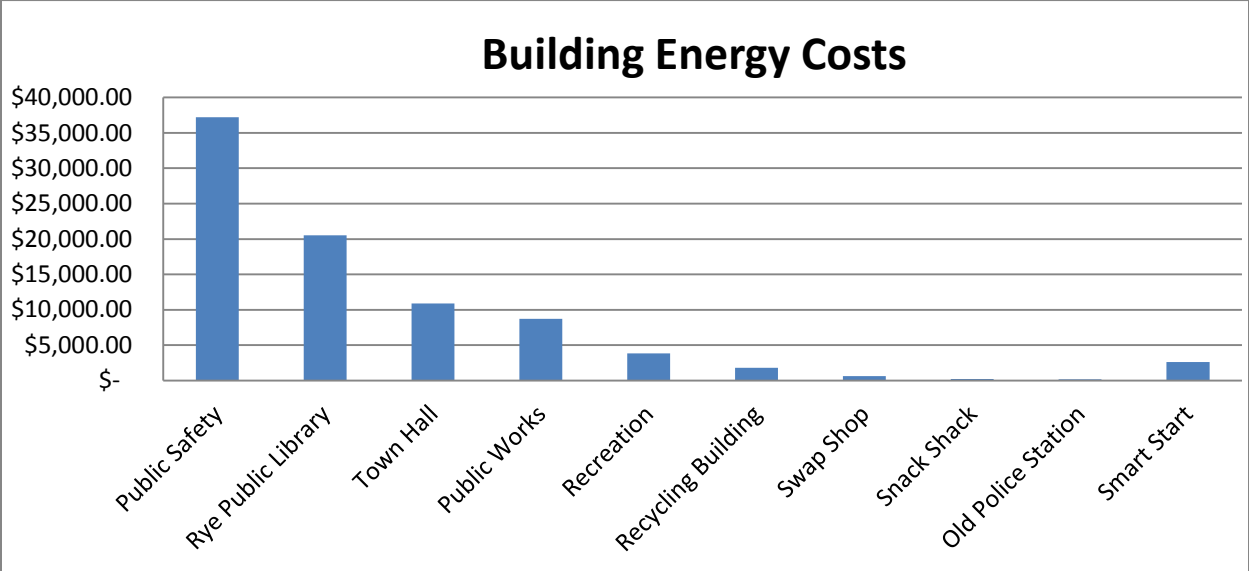
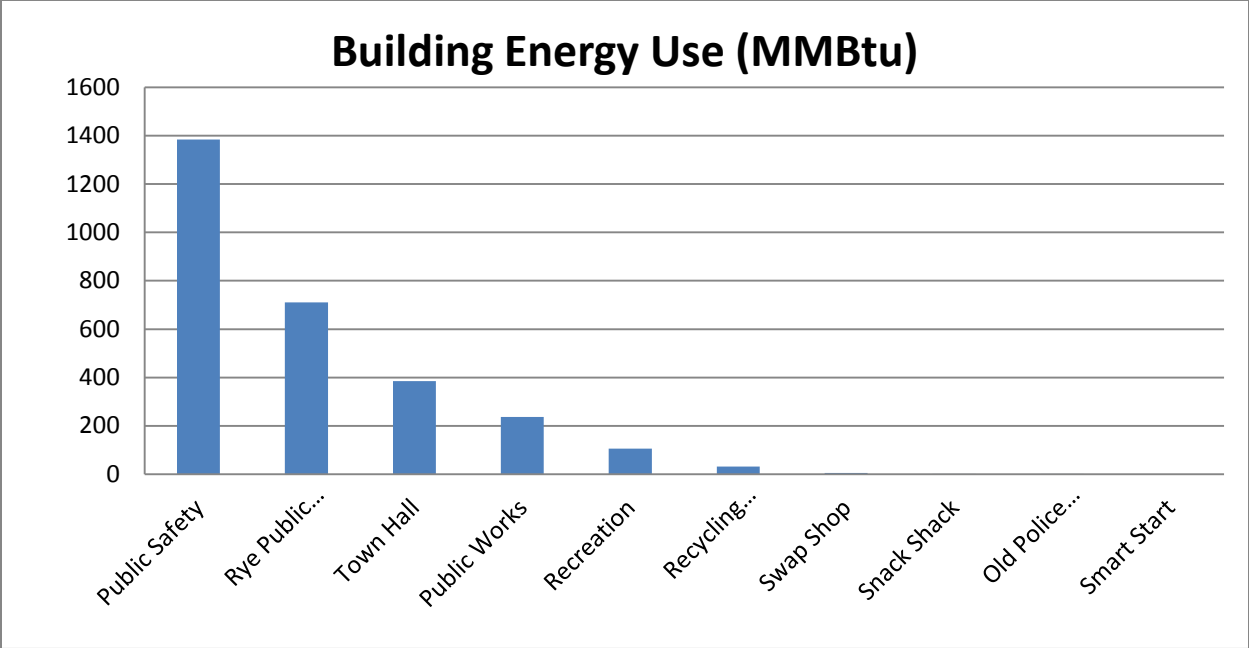
The Rye Energy Committee was formed in 2007. Since its inception the REC has focused its programs and activities on home energy, municipal energy, and local food. Its website is www.ryeturninggreen.com and its email newsletter is called Rye Eats Local.

Appendix B

Small Town Carbon Calculator (STOCC) Results for Selectmen-controlled portion of Rye only.

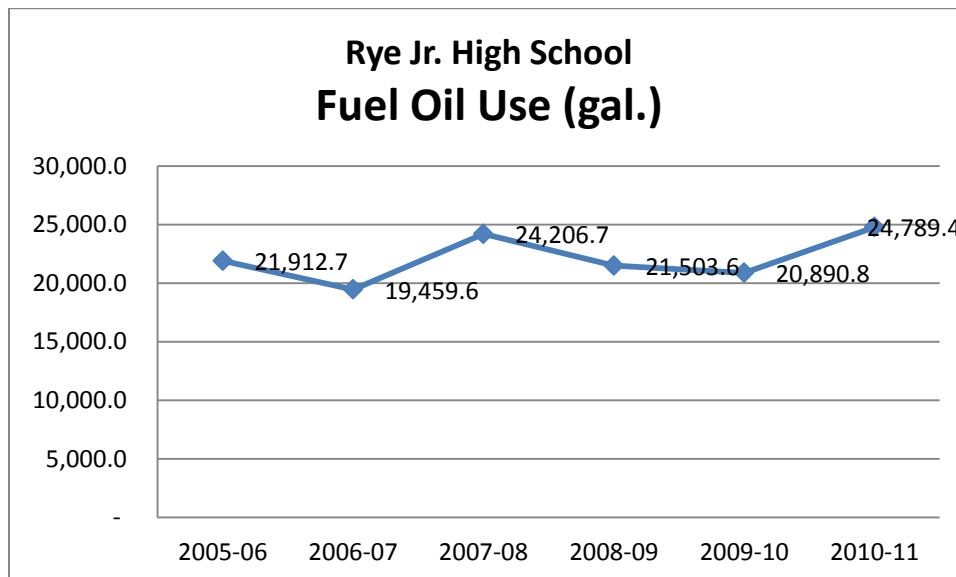
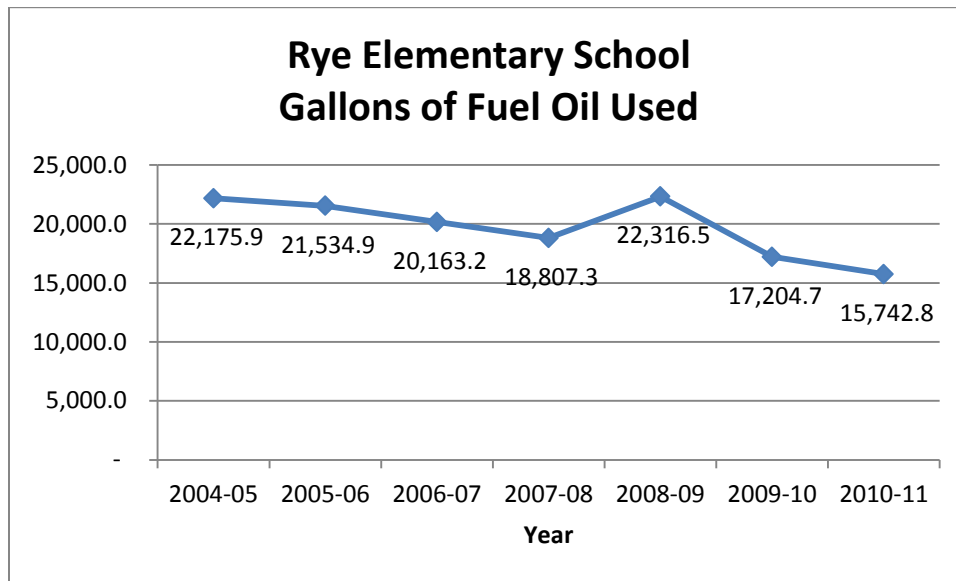
2011 Summary Report							
	Buildings		Vehicles		Streetlights		Grand Total
	#	% of total	#	% of total	#	% of total	
Annual Fuel Expense	\$86,612	53%	\$71,168	43%	\$6,156	4%	\$163,936
Annual CO2 Emissions (lbs)	544862.6	53%	461059	45%	13976	1%	1019898
Annual Energy Use (MMBtu)	2861.6	49%	2902.1	50%	51.4	1%	5815.2



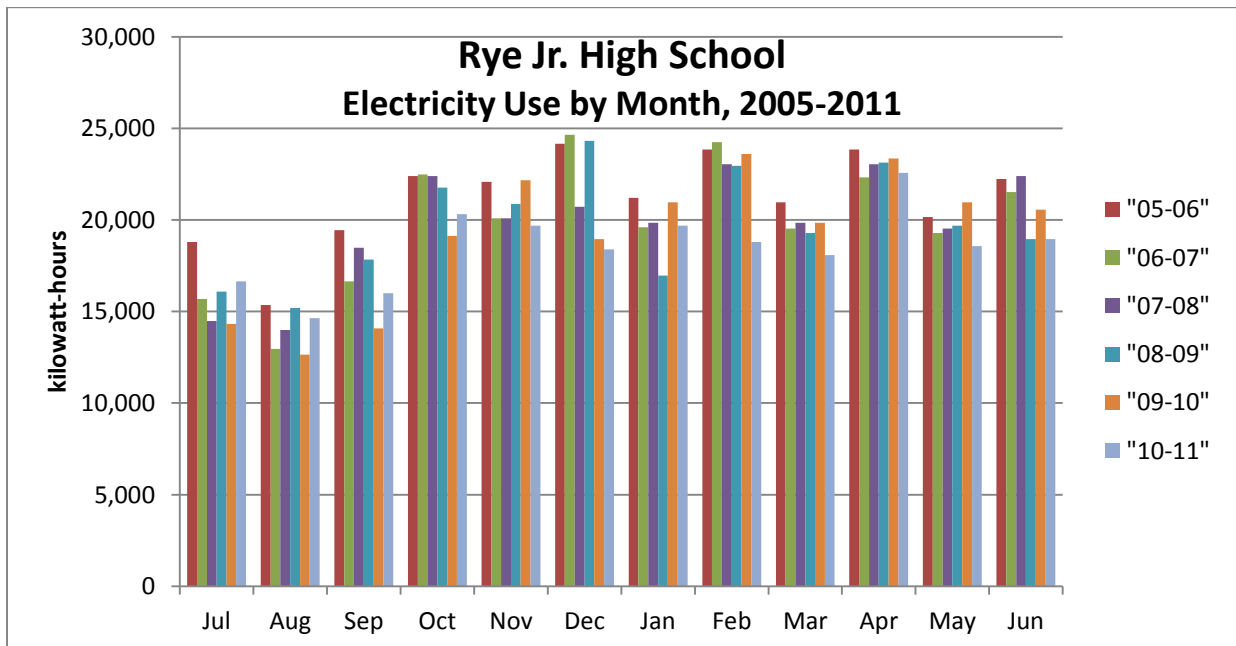
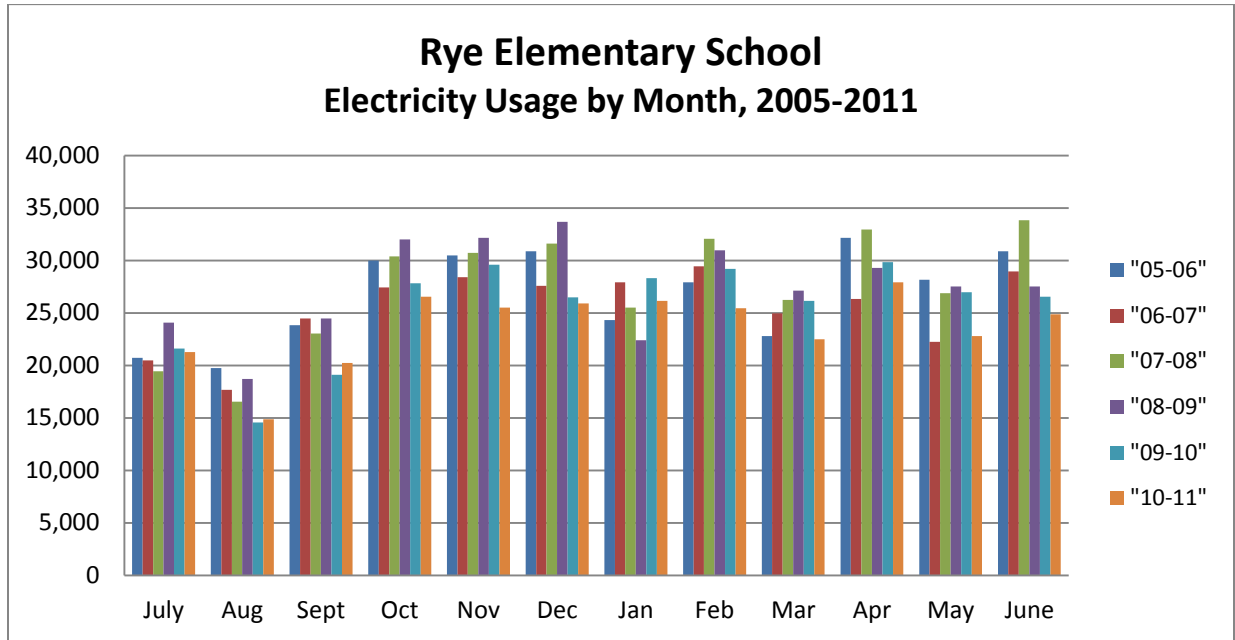


Appendix C
Energy Trend Charts
For
Rye Municipal Buildings
& Operations

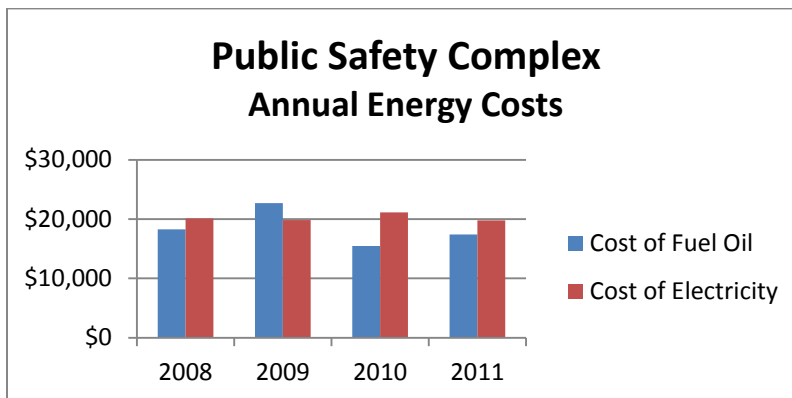
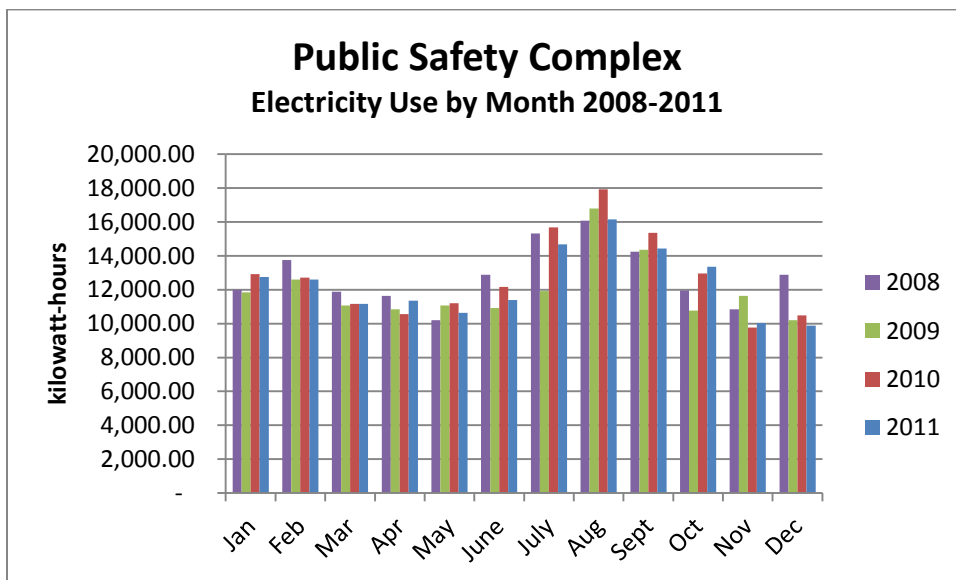
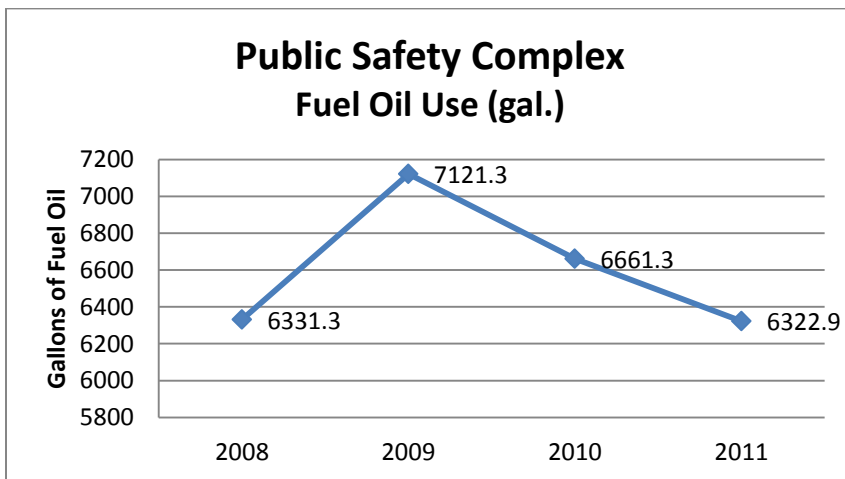
Rye Schools Annual Fuel Oil Use



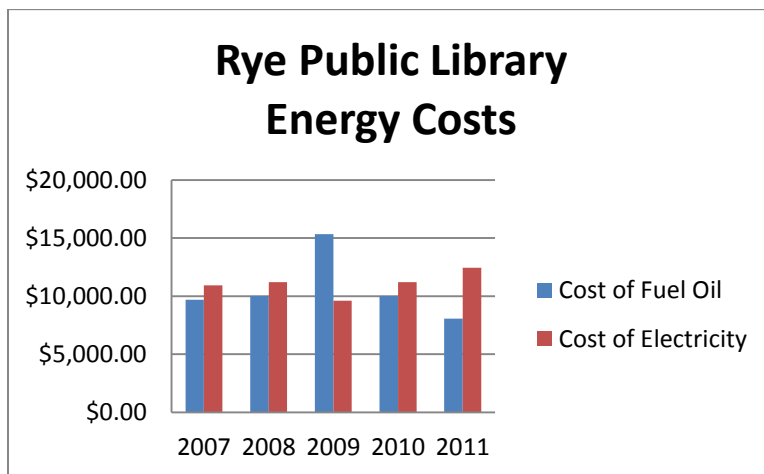
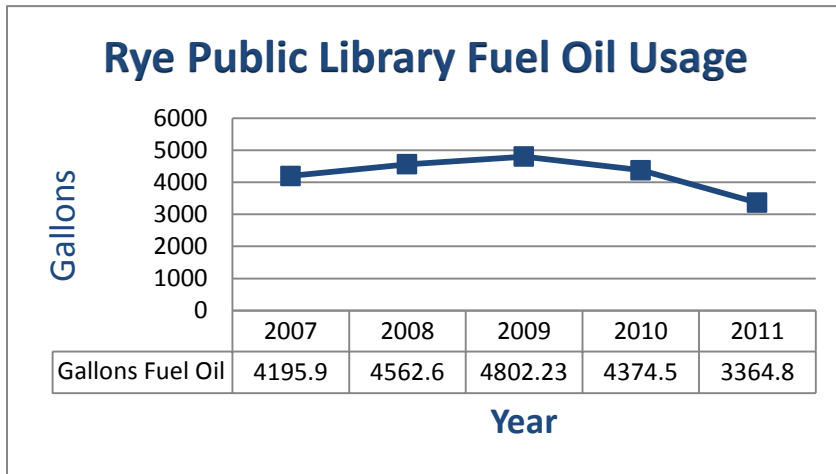
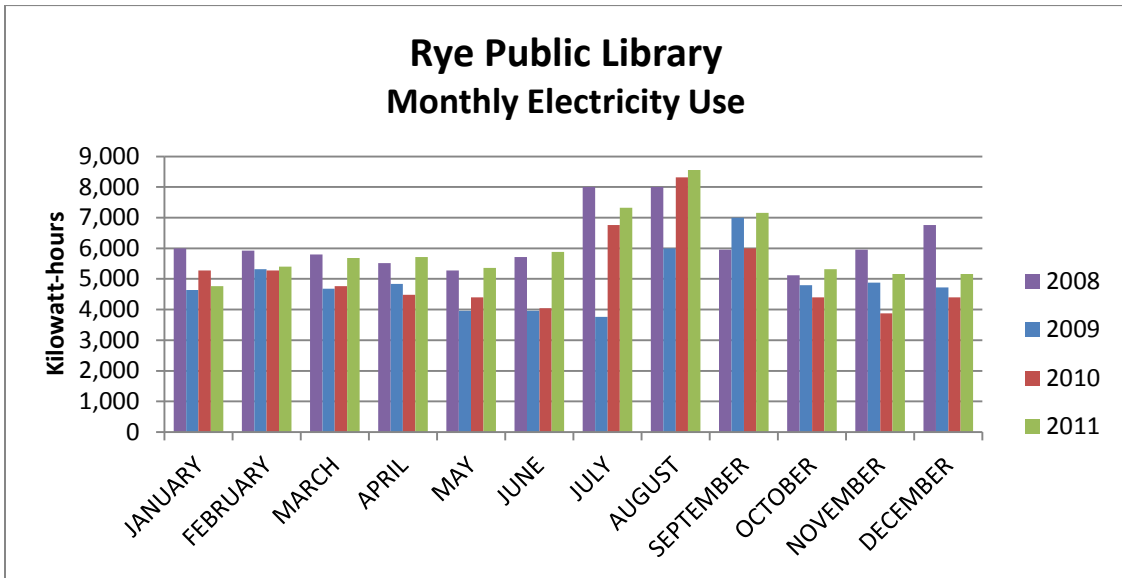
Rye Schools Electricity Use



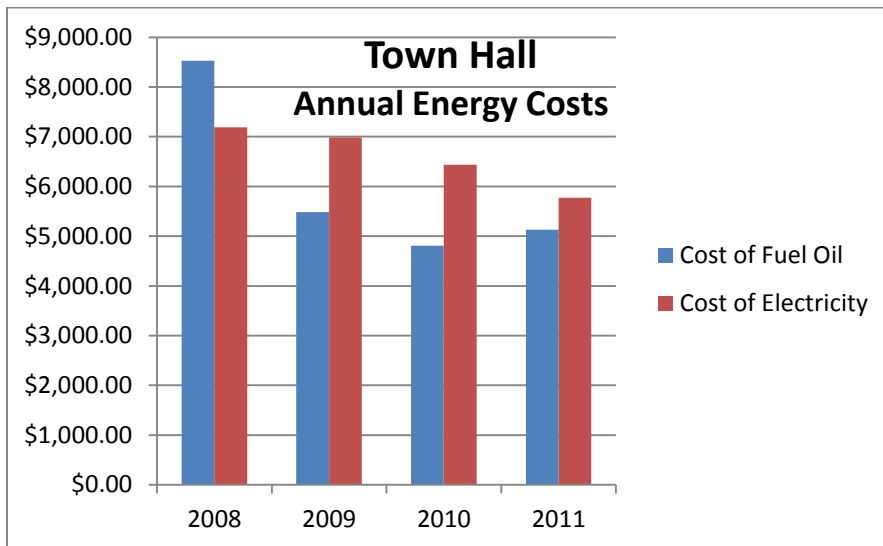
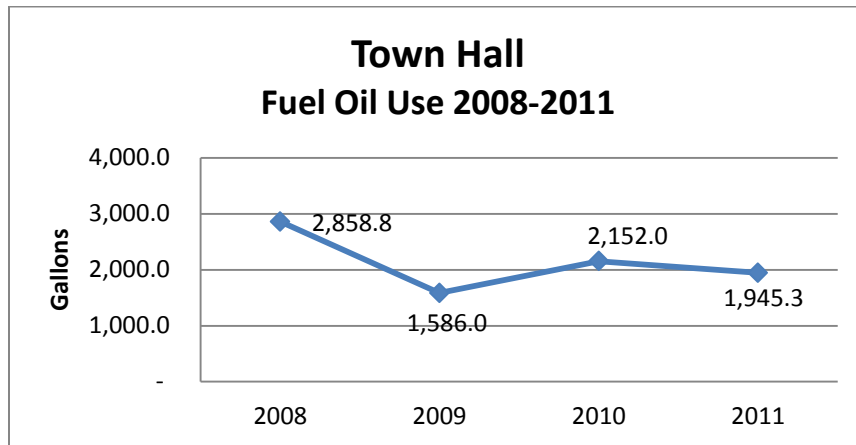
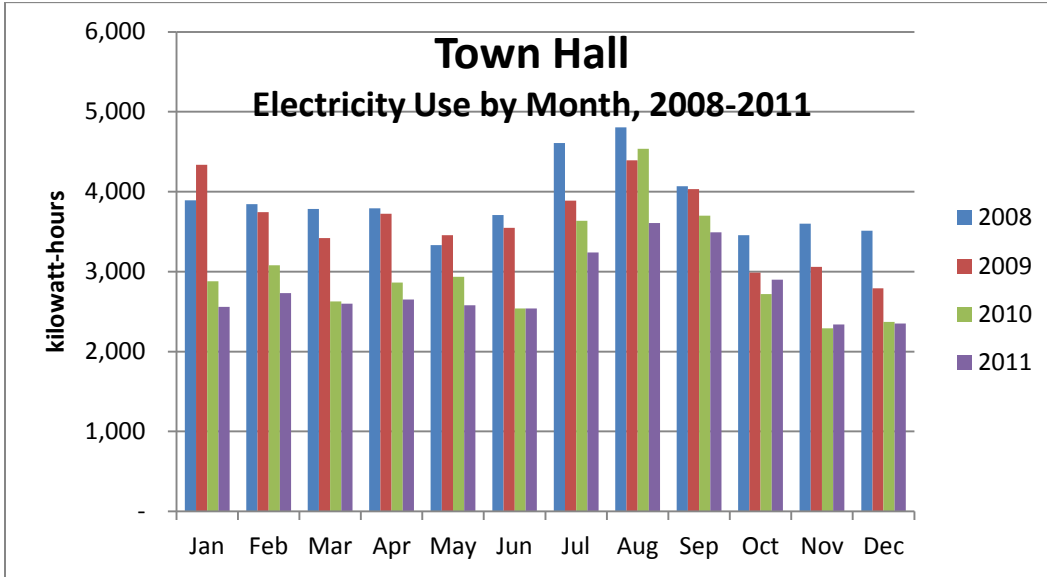
Public Safety Complex



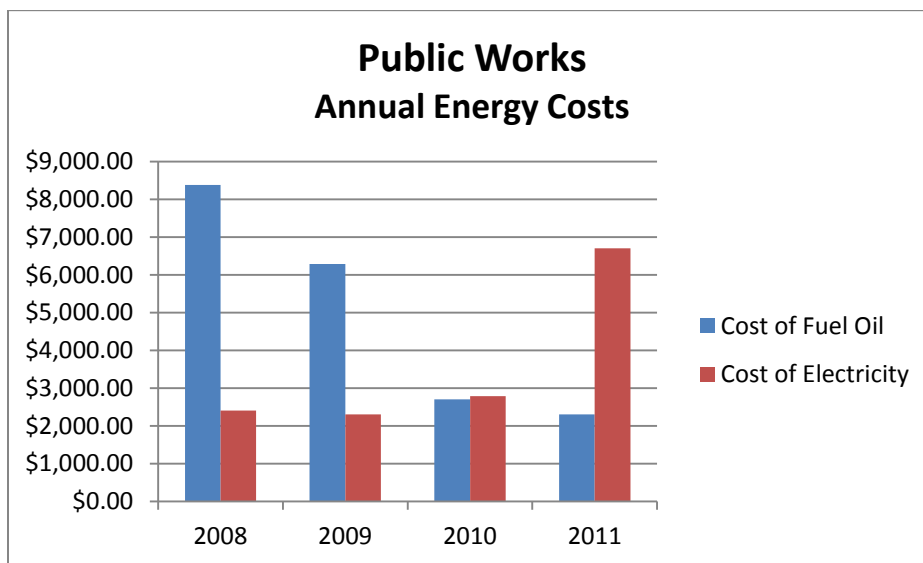
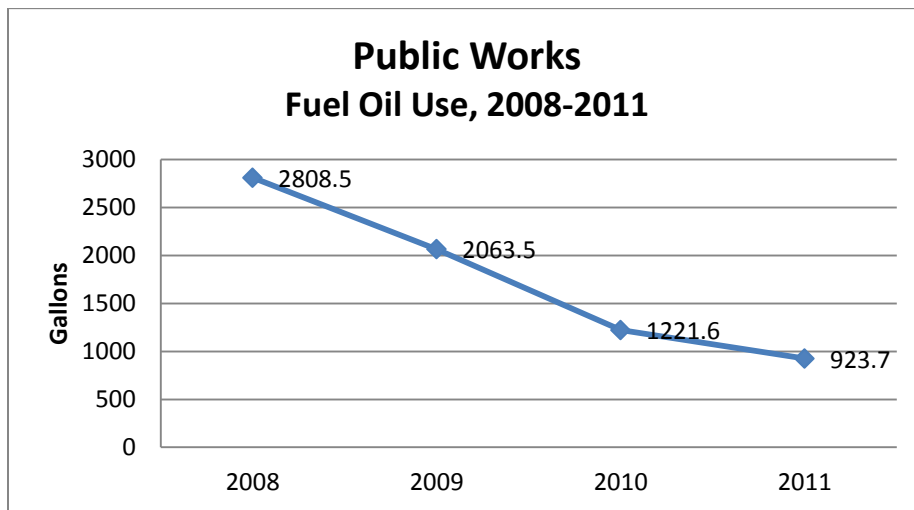
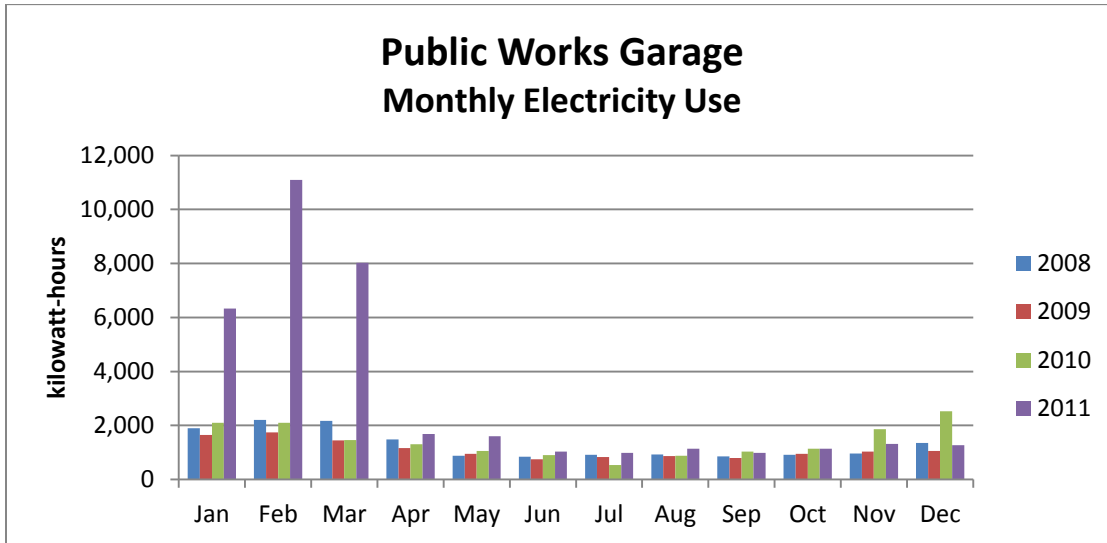
Rye Public Library



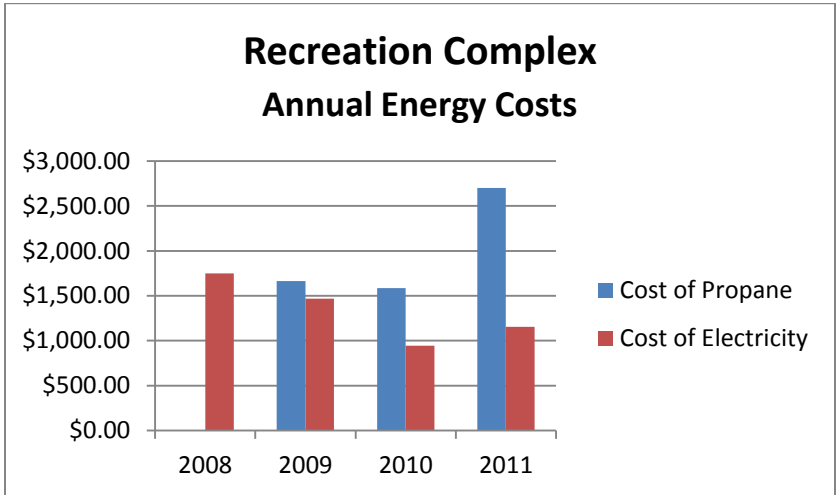
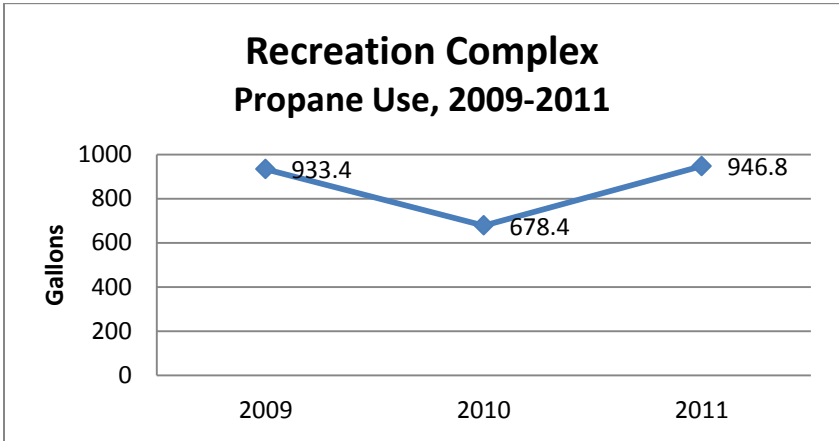
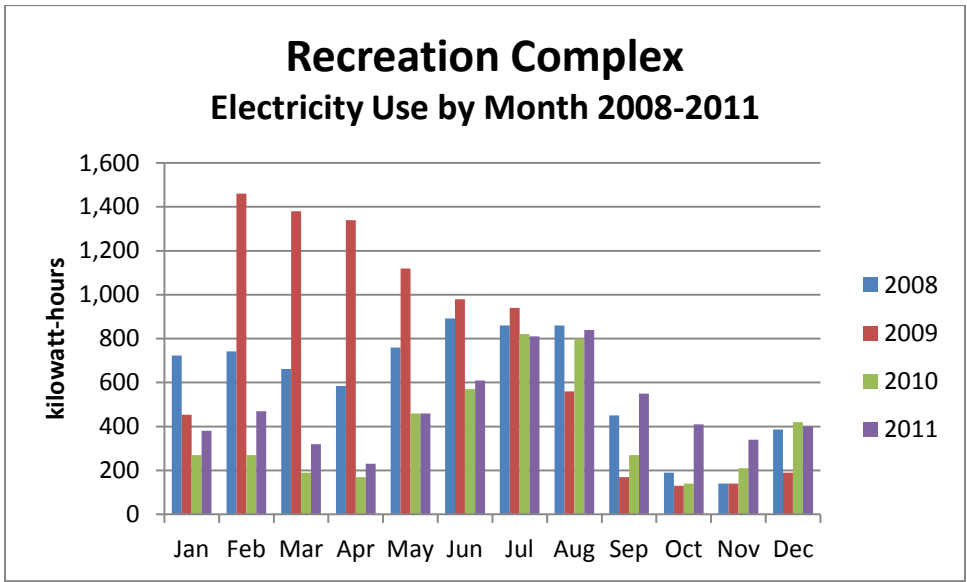
Rye Town Hall



Rye Public Works



Rye Recreation Complex



Appendix D

PSNH Rates January 2012

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
Summary of Rates Effective January 1, 2012

Rate	Blocks	Distribution Charge	Transmission Charge	Stranded Cost Recovery Charge	System Benefits Charge	Electricity Consumption Tax	Total Delivery Service	Energy Service Charge	Total Rate
R	Customer charge	\$ 11.54					\$ 11.54		\$ 11.54
	All KWH	\$ 0.03767	\$ 0.01293	\$ 0.01308	\$0.00330	\$ 0.00055	\$ 0.06753	\$0.08310	\$ 0.15063
Uncontrolled Water Heating*	Meter charge	\$ 4.07					\$ 4.07		\$ 4.07
	All KWH	\$ 0.01846	\$ 0.00999	\$ 0.01308	\$0.00330	\$ 0.00055	\$ 0.04538	\$0.08310	\$ 0.12848
Controlled Water Heating*	Meter charge	\$ 7.16					\$ 7.16		\$ 7.16
	All KWH	\$ 0.00109	\$ 0.00999	\$ 0.00809	\$0.00330	\$ 0.00055	\$ 0.02302	\$0.08310	\$ 0.10612
R-OTOD	Customer charge	\$ 26.80					\$ 26.80		\$ 26.80
	On-peak KWH	\$ 0.12036	\$ 0.01293	\$ 0.01133	\$0.00330	\$ 0.00055	\$ 0.14847	\$0.08310	\$ 0.23157
	Off-peak KWH	\$ 0.00175	\$ 0.00843	\$ 0.01133	\$0.00330	\$ 0.00055	\$ 0.02536	\$0.08310	\$ 0.10846
G	Single phase customer charge	\$ 13.53					\$ 13.53		\$ 13.53
	Three phase customer charge	\$ 27.05					\$ 27.05		\$ 27.05
	Load charge (over 5 KW)	\$ 7.93	\$ 3.34	\$ 0.72			\$ 11.99		\$ 11.99
	First 500 KWH	\$ 0.06352	\$ 0.01204	\$ 0.01058	\$0.00330	\$ 0.00055	\$ 0.08999	\$0.08310	\$ 0.17309
	Next 1,000 KWH	\$ 0.01574	\$ 0.00453	\$ 0.01058	\$0.00330	\$ 0.00055	\$ 0.03470	\$0.08310	\$ 0.11780
	All additional KWH	\$ 0.00556	\$ 0.00243	\$ 0.01058	\$0.00330	\$ 0.00055	\$ 0.02242	\$0.08310	\$ 0.10552
Space Heating**	Meter charge	\$ 2.71					\$ 2.71		\$ 2.71
	All KWH	\$ 0.03114	\$ 0.01204	\$ 0.01618	\$0.00330	\$ 0.00055	\$ 0.06321	\$0.08310	\$ 0.14631
G-OTOD	Single phase customer charge	\$ 35.07					\$ 35.07		\$ 35.07
	Three phase customer charge	\$ 50.10					\$ 50.10		\$ 50.10
	Load charge	\$ 11.05	\$ 2.20	\$ 0.28			\$ 13.53		\$ 13.53
	On-peak KWH	\$ 0.04456		\$ 0.00843	\$0.00330	\$ 0.00055	\$ 0.05684	\$0.08310	\$ 0.13994
	Off-peak KWH	\$ 0.00698		\$ 0.00843	\$0.00330	\$ 0.00055	\$ 0.01926	\$0.08310	\$ 0.10236
LCS***	Radio-controlled option	\$ 8.29					\$ 8.29		\$ 8.29
	8, 10 or 11-hour option	\$ 7.16					\$ 7.16		\$ 7.16
	Switch option	\$ 8.29					\$ 8.29		\$ 8.29
	Radio-controlled option	\$ 0.00109	\$ 0.00999	\$ 0.00809	\$0.00330	\$ 0.00055	\$ 0.02302	\$0.08310	\$ 0.10612
	8-hour option	\$ 0.00109	\$ 0.00999	\$ 0.00809	\$0.00330	\$ 0.00055	\$ 0.02302	\$0.08310	\$ 0.10612
	10 or 11-hour option	\$ 0.02225	\$ 0.00999	\$ 0.00809	\$0.00330	\$ 0.00055	\$ 0.04418	\$0.08310	\$ 0.12728

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
Summary of Rates Effective January 1, 2012
Outdoor Lighting Service Rate OL, All-Night Service Option

	Lumens	Watts	Distribution Charge	Total Monthly Charge, Including Energy Service*												Total Annual Charge
				January	February	March	April	May	June	July	August	September	October	November	December	
For new and existing installations																
High Pressure Sodium	4,000	50	\$ 14.39	\$ 17.31	\$ 16.97	\$ 16.77	\$ 16.45	\$ 16.12	\$ 16.12	\$ 16.12	\$ 16.34	\$ 16.66	\$ 16.88	\$ 16.99	\$ 17.31	\$ 200.04
	5,800	70	14.39	18.72	18.20	17.85	17.53	16.99	16.88	16.99	17.31	17.75	18.18	18.39	18.72	213.51
	9,500	100	19.12	25.51	24.73	24.21	23.67	22.91	22.80	22.91	23.34	24.10	24.64	24.86	25.51	289.19
	16,000	150	27.04	36.57	35.34	34.62	33.75	32.78	32.56	32.78	33.43	34.40	35.27	35.59	36.57	413.66
	30,000	250	27.72	43.09	41.18	39.95	38.65	36.92	36.60	36.92	38.00	39.63	41.03	41.57	43.09	476.63
	50,000	400	28.03	51.52	48.55	46.76	44.70	42.10	41.67	42.10	43.62	46.21	48.38	49.25	51.52	556.38
	130,000	1,000	44.98	100.18	93.20	89.14	84.16	78.10	77.02	78.10	81.78	87.73	92.82	94.77	100.18	1,057.18
Metal Halide	5,000	70	15.02	19.46	18.94	18.59	18.16	17.73	17.62	17.73	18.05	18.48	18.92	19.02	19.46	222.16
	8,000	100	20.53	26.59	25.80	25.40	24.86	24.21	24.10	24.21	24.64	25.29	25.83	26.05	26.59	303.57
	13,000	150	28.18	37.71	36.48	35.87	35.00	33.92	33.70	33.92	34.57	35.54	36.51	36.84	37.71	427.77
	13,500	175	28.78	39.17	37.86	37.11	36.14	34.95	34.84	34.95	35.71	36.79	37.76	38.20	39.17	442.65
	20,000	250	28.78	43.28	41.45	40.36	39.06	37.44	37.22	37.44	38.41	40.04	41.34	41.88	43.28	481.20
	36,000	400	29.04	51.66	48.78	47.12	45.17	42.68	42.25	42.68	44.19	46.57	48.63	49.50	51.66	560.89
	100,000	1,000	43.52	97.86	90.95	87.03	82.05	76.10	75.13	76.10	79.78	85.63	90.60	92.66	97.86	1,031.75
For existing installations only																
Incandescent	600	105	8.29	13.59	12.89	12.51	12.08	11.43	11.32	11.43	11.86	12.40	12.84	13.05	13.59	148.99
	1,000	105	9.25	14.55	13.85	13.47	13.04	12.39	12.28	12.39	12.82	13.36	13.80	14.01	14.55	160.51
	2,500	205	11.86	22.14	20.83	20.09	19.22	18.03	17.81	18.03	18.79	19.87	20.84	21.17	22.14	238.96
	6,000	448	20.37	42.88	40.11	38.45	36.39	33.90	33.47	33.90	35.42	37.80	39.96	40.72	42.88	455.88
Mercury	3,500	100	12.70	18.54	17.86	17.46	16.92	16.27	16.16	16.27	16.60	17.25	17.79	18.00	18.54	207.66
	7,000	175	15.26	25.54	24.23	23.49	22.62	21.43	21.21	21.43	22.19	23.27	24.24	24.57	25.54	279.76
	11,000	250	18.88	33.60	31.66	30.68	29.27	27.65	27.43	27.65	28.73	30.25	31.65	32.19	33.60	364.36
	15,000	400	21.59	44.43	41.55	39.88	37.72	35.23	34.80	35.23	36.74	39.23	41.40	42.16	44.43	472.80
	20,000	400	23.30	46.14	43.26	41.59	39.43	36.94	36.51	36.94	38.45	40.94	43.11	43.87	46.14	493.32
	56,000	1,000	37.04	91.48	84.59	80.66	75.68	69.73	68.65	69.73	73.30	79.25	84.23	86.18	91.48	954.96
Fluorescent	20,000	330	31.59	48.15	46.06	44.90	43.39	41.55	41.22	41.55	42.63	44.47	45.99	46.64	48.15	534.70
High Pressure Sodium in existing mercury luminaires																
	12,000	150	19.77	28.86	27.73	27.02	26.16	25.18	25.07	25.18	25.83	26.81	27.67	28.00	28.86	322.37
	34,200	360	25.30	46.08	43.47	41.97	40.02	37.75	37.42	37.75	39.15	41.43	43.27	44.03	46.08	498.42

* Rates shown here are equal to the fixed monthly distribution charge, plus the monthly KWH multiplied by the sum of the Transmission Charge, the Stranded Cost Recovery Charge, the System Benefits Charge, the Electricity Consumption Tax, and the Energy Service Charge. These amounts may vary slightly from actual bill calculations due to intermediate rounding of individual rate components on bills. The monthly charges for February reflect a 3.6% increase in KWH usage in accordance with the "Leap Year Adjustment to Energy" provision of the tariff.

Transmission Charge	0.884	¢/KWH
Stranded Cost Recovery Charge	1.245	¢/KWH
System Benefits Charge	0.330	¢/KWH
Electricity Consumption Tax	0.055	¢/KWH
Energy Service Charge	8.310	¢/KWH

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
Summary of Rates Effective January 1, 2012
Energy Efficient Outdoor Lighting Service Rate EOL, All-Night Service Option

	Lumens	Watts	Distribution Charge	Total Monthly Charge, Including Energy Service*												Total Annual Charge
				January	February	March	April	May	June	July	August	September	October	November	December	
High Pressure Sodium	4,000	50	\$ 7.66	\$ 10.58	\$ 10.24	\$ 10.04	\$ 9.72	\$ 9.39	\$ 9.39	\$ 9.39	\$ 9.61	\$ 9.93	\$ 10.15	\$ 10.26	\$ 10.58	\$ 119.28
	5,800	70	7.66	11.99	11.47	11.12	10.80	10.26	10.15	10.26	10.58	11.02	11.45	11.66	11.99	132.75
	9,500	100	9.41	15.80	15.02	14.50	13.96	13.20	13.09	13.20	13.63	14.39	14.93	15.15	15.80	172.67
	16,000	150	10.34	19.87	18.64	17.92	17.05	16.08	15.86	16.08	16.73	17.70	18.57	18.89	19.87	213.26
	30,000	250	10.34	25.71	23.80	22.57	21.27	19.54	19.22	19.54	20.62	22.25	23.65	24.19	25.71	268.07
	50,000	400	10.68	34.17	31.20	29.41	27.35	24.75	24.32	24.75	26.27	28.86	31.03	31.90	34.17	348.18
	130,000	1,000	20.26	75.46	68.48	64.42	59.44	53.38	52.30	53.38	57.06	63.01	68.10	70.05	75.46	760.54
Metal Halide	5,000	70	7.95	12.39	11.87	11.52	11.09	10.66	10.55	10.66	10.98	11.41	11.85	11.95	12.39	137.32
	8,000	100	10.50	16.56	15.77	15.37	14.83	14.18	14.07	14.18	14.61	15.26	15.80	16.02	16.56	183.21
	13,000	150	11.21	20.74	19.51	18.90	18.03	16.95	16.73	16.95	17.60	18.57	19.54	19.87	20.74	224.13
	13,500	175	11.82	22.21	20.90	20.15	19.18	17.99	17.88	17.99	18.75	19.83	20.80	21.24	22.21	239.13
	20,000	250	12.00	26.50	24.67	23.58	22.28	20.66	20.44	20.66	21.63	23.26	24.56	25.10	26.50	279.84
	36,000	400	12.35	34.97	32.09	30.43	28.48	25.99	25.56	25.99	27.50	29.88	31.94	32.81	34.97	360.61
	100,000	1,000	22.00	76.34	69.43	65.51	60.53	54.58	53.61	54.58	58.26	64.11	69.08	71.14	76.34	773.51

* Rates shown here are equal to the fixed monthly distribution charge, plus the monthly KWH multiplied by the sum of the Transmission Charge, the Stranded Cost Recovery Charge, the System Benefits Charge, the Electricity Consumption Tax, and the Energy Service Charge. These amounts may vary slightly from actual bill calculations due to intermediate rounding of individual rate components on bills. The monthly charges for February reflect a 3.6% increase in KWH usage in accordance with the "Leap Year Adjustment to Energy" provision of the tariff.

Transmission Charge	0.884 ¢/KWH
Stranded Cost Recovery Charge	1.245 ¢/KWH
System Benefits Charge	0.330 ¢/KWH
Electricity Consumption Tax	0.055 ¢/KWH
Energy Service Charge	8.310 ¢/KWH

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
Summary of Rates Effective January 1, 2012
Outdoor Lighting Service Rate OL, Midnight Service Option

	Lumens	Watts	Distribution Charge	Total Monthly Charge, Including Energy Service*												Total Annual Charge
				January	February	March	April	May	June	July	August	September	October	November	December	
High Pressure Sodium	4,000	50	\$ 14.39	\$ 15.91	\$ 15.62	\$ 15.36	\$ 15.47	\$ 15.15	\$ 15.04	\$ 15.04	\$ 15.15	\$ 15.36	\$ 15.58	\$ 15.80	\$ 15.91	\$ 185.39
	5,800	70	14.39	16.55	16.18	15.80	16.01	15.58	15.36	15.36	15.58	15.80	16.12	16.55	16.66	191.55
	9,500	100	19.12	22.37	21.70	21.28	21.39	20.85	20.53	20.64	20.85	21.18	21.72	22.15	22.48	257.14
	16,000	150	27.04	31.80	30.85	30.18	30.40	29.64	29.20	29.31	29.64	30.07	30.83	31.59	32.13	365.64
	30,000	250	27.72	35.41	34.00	32.81	33.24	31.83	31.18	31.29	31.83	32.70	33.89	35.19	35.95	399.32
	50,000	400	28.03	39.83	37.56	35.82	36.36	34.31	33.33	33.55	34.31	35.61	37.45	39.40	40.59	438.12
	130,000	1,000	44.98	72.58	67.41	63.38	64.57	59.70	57.43	57.86	59.70	62.84	67.06	71.61	74.42	778.56
Metal Halide	5,000	70	15.02	17.18	16.81	16.54	16.64	16.21	15.99	16.10	16.21	16.43	16.86	17.18	17.40	199.55
	8,000	100	20.53	23.56	23.00	22.59	22.69	22.15	21.94	21.94	22.15	22.48	23.02	23.45	23.78	272.75
	13,000	150	28.18	32.94	31.99	31.43	31.54	30.78	30.34	30.45	30.78	31.21	32.08	32.83	33.27	379.64
	13,500	175	28.78	33.98	33.04	32.24	32.46	31.49	31.16	31.16	31.59	32.14	32.89	33.87	34.30	390.32
	20,000	250	28.78	36.03	34.61	33.65	33.98	32.68	32.03	32.14	32.68	33.43	34.62	35.82	36.47	408.14
	36,000	400	29.04	40.30	38.24	36.62	37.05	35.10	34.13	34.34	35.10	36.40	38.13	39.97	41.05	446.43
	100,000	1,000	43.52	70.69	65.50	61.60	62.79	58.02	55.86	56.18	58.02	61.05	65.28	69.82	72.53	757.34

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Transmission Charge	0.884 ¢/KWH
Stranded Cost Recovery Charge	1.245 ¢/KWH
System Benefits Charge	0.330 ¢/KWH
Electricity Consumption Tax	0.055 ¢/KWH
Energy Service Charge	8.310 ¢/KWH

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
Summary of Rates Effective January 1, 2012
Energy Efficient Outdoor Lighting Service Rate EOL, Midnight Service Option

	Lumens	Watts	Distribution Charge	Total Monthly Charge, Including Energy Service*												Total Annual Charge
				January	February	March	April	May	June	July	August	September	October	November	December	
High Pressure Sodium	4,000	50	\$ 7.66	\$ 9.18	\$ 8.89	\$ 8.63	\$ 8.74	\$ 8.42	\$ 8.31	\$ 8.31	\$ 8.42	\$ 8.63	\$ 8.85	\$ 9.07	\$ 9.18	\$ 104.63
	5,800	70	7.66	9.82	9.45	9.07	9.28	8.85	8.63	8.63	8.85	9.07	9.39	9.82	9.93	110.79
	9,500	100	9.41	12.66	11.99	11.57	11.68	11.14	10.82	10.93	11.14	11.47	12.01	12.44	12.77	140.62
	16,000	150	10.34	15.10	14.15	13.48	13.70	12.94	12.50	12.61	12.94	13.37	14.13	14.89	15.43	165.24
	30,000	250	10.34	18.03	16.62	15.43	15.86	14.45	13.80	13.91	14.45	15.32	16.51	17.81	18.57	190.76
	50,000	400	10.68	22.48	20.21	18.47	19.01	16.96	15.98	16.20	16.96	18.26	20.10	22.05	23.24	229.92
	130,000	1,000	20.26	47.86	42.69	38.66	39.85	34.98	32.71	33.14	34.98	38.12	42.34	46.89	49.70	481.92
Metal Halide	5,000	70	7.95	10.11	9.74	9.47	9.57	9.14	8.92	9.03	9.14	9.36	9.79	10.11	10.33	114.71
	8,000	100	10.50	13.53	12.97	12.56	12.66	12.12	11.91	11.91	12.12	12.45	12.99	13.42	13.75	152.39
	13,000	150	11.21	15.97	15.02	14.46	14.57	13.81	13.37	13.48	13.81	14.24	15.11	15.86	16.30	176.00
	13,500	175	11.82	17.02	16.08	15.28	15.50	14.53	14.20	14.20	14.63	15.18	15.93	16.91	17.34	186.80
	20,000	250	12.00	19.25	17.83	16.87	17.20	15.90	15.25	15.36	15.90	16.65	17.84	19.04	19.69	206.78
	36,000	400	12.35	23.61	21.55	19.93	20.36	18.41	17.44	17.65	18.41	19.71	21.44	23.28	24.36	246.15
	100,000	1,000	22.00	49.17	43.98	40.08	41.27	36.50	34.34	34.66	36.50	39.53	43.76	48.30	51.01	499.10

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Transmission Charge	0.884	¢/KWH
Stranded Cost Recovery Charge	1.245	¢/KWH
System Benefits Charge	0.330	¢/KWH
Electricity Consumption Tax	0.055	¢/KWH
Energy Service Charge	8.310	¢/KWH

APPENDIX E
PSNH Accounts for Rye

PSNH Acct. No.	PSNH Service Ref.	Meter Number	Dept.	Address	Location	Use	Pole Number	Rate	Rye Account	2011 Charges
56172141012	780560000	W01868180	Town Hall	10 Central Rd.	Building	meter		G - 3 Phase	01-4194-07-480	\$5,775.33
56172141012	276560006		Town Hall	10 Central Rd.	Parking Lot	Outside Light	5/3A	OL 5800L HPS	01-4194-07-480	\$212.91
56172141012	324560005		Town Hall	10 Central Rd.	Parking Lot	Area Light	5/3A1/2	OL 3500L Merc.	01-4194-07-480	\$206.64
56172141012	944170007	G23765209	Public Works	309 Grove Rd.	Garage	meter		G - 3 Phase	01-4194-06-480	\$6,701.79
56098641061	963901002	D80788226	Transfer Sta	309 Grove Rd.	Swap Shop	meter		G - 3 Phase	01-4323-33-480	\$614.27
56172141012	439070009	S38163422	Transfer Sta	309 Grove Rd.	Recycl. Bldg.	meter		G - 3 Phase	01-4323-33-480	\$1,810.57
56500551015	105711006	S38493839	Public Safety	Wash. Rd.	Police/Fire	meter		G - 3 Phase	01-4194-08-480	\$19,777.09
56172141012	966280007	S34691875	Recreation	S34691875	Rec Building	meter		G - 1 Phase	01-4520-50-480	\$1,153.24
56544341027	906601008	G15825284	Recreation	G15825284	Snack Shack	meter		G - 1 Phase	01-4520-50-480	\$215.63
56172141012	717280005		Recreation	Recreation Rd.	Road	2 Area Lites	74/4,74/5	OL 3500L Merc.	01-4520-50-480	\$556.61
56172141012	487280006		Recreation	Recreation Rd.	Parking Lot	Area Light	74/6	OL 13500L MH	01-4520-50-480	\$411.01
56172141012	076280007		Recreation	Recreation Rd.	Parking Lot	Area Light	74/7	OL 36000L MH	01-4520-50-480	\$556.51
56588831008	621301009	W01868237	Sewer	25 Church Rd.		Pump Station		G - 3 Phase	02-4326-90-480	\$5,382.95
56779731017	885201008	G23577025	Sewer	Ocean Blvd.	Jenness	Pump Station		G - 3 Phase	02-4326-90-480	\$3,004.76
56735731085	738201006	W78561850	Sewer	Central Rd.	Abenaki	Pump Station		G - 3 Phase	02-4326-90-480	\$661.34
8001076-01-2-4			Street Lights	see below	see below	9 Street Lights		see below	01-4316-27-480	\$2,192.84
				Wash. Rd	at Wayside Lane		2/82	OL 3500L Merc		
				Wash. Rd	at Central Rd.		2/87	OL 7000L Merc		
				Wash. Rd	at Congo Church		2/91	OL 3500L Merc		
				Wash. Rd	Opp. Old Parish		2/94	OL 3500L Merc		
				Wash. Rd			2/97	OL 3500L Merc		
				Wash. Rd	Opp. Lang Rd.		2/100	OL 3500L Merc		
				Wash. Rd	at TD Bank		2/103	OL 4000L HPS		
				Wallis Rd.	at Wash. Rd.	Grange Park	43/127	OL 3500L Merc		
				Wentworth Rd.	at bridge		13/53A1	OL 30,000L HPS		
56220141089	717401000		Street Lights	10 Central Rd.	Town Hall	2 Area Lites	5/3A1/Y	OL 11000 Merc.	01-4194-27-480	
not used	489501003	D24095246		37 Central Rd.		sign			01-4316-27-480	

PSNH	PSNH	Meter					Pole		Rye	2011
Acct. No.	Service Ref.	Number	Dept.	Address	Location	Use	Number	Rate	Account	Charges
56172141012	809460009	D94313720	Street Lights	37 Central Rd.	Old Police Bldg.	meter		G - 1 Phase	01-4316-27-480	\$163.18
56798421061	729801000	G82445488	Street Lights	Ocean Blvd.	at Wallis (N)	Ped. Flasher	7/208A	G - 1 Phase	01-4316-27-480	\$179.54
56798421061	565901003	G77198282	Street Lights	Ocean Blvd.	at Wallis (S)	Ped. Flasher	7/206	G - 1 Phase	01-4316-27-480	\$187.59
56119005015	192303005	D99464426	Street Lights	Ocean Blvd.	at Perkins (S)	Ped. Flasher	7/34/A	G - 1 Phase	01-4316-27-480	\$177.62
56692641004	404901005	G77198559	Street Lights	Ocean Blvd.	at Perkins (N)	Ped. Flasher	7/37/4JT	G - 1 Phase	01-4316-27-480	\$184.02
56798421061	146401009	S23698183	Area Light	Wallis Rd.	Grange Park			G - 1 Phase	01-4316-27-480	\$180.74
56798421061	145390002	D22560426	Area Light	Wash. Rd	Parsons Field			G - 1 Phase	01-4316-27-480	\$179.54
56172141012	939413004	Town Hall, 10 Central Rd.			Energy Efficiency	Lighting		SSP Smart Start	01-4316-27-480	\$1,150.00
56172141012	117513006	Rec Area, Recreation Rd.			Energy Efficiency	Lighting		SSP Smart Start	01-4316-27-480	\$440.00
56172141012	253513005	Highway Garage, 309 Grove Rd.			Energy Efficiency	Lighting		SSP Smart Start	01-4316-27-480	\$720.00
56172141012	323513000	Swap Shop, 309 Grove Rd.			Energy Efficiency	Lighting		SSP Smart Start	01-4316-27-480	\$305.00
56531731040	524201001	S66227598	Public Library	581 Wash. Rd.	building	meter		G - 3 Phase		\$12,454.21
			Public Library	581 Wash. Rd.	Energy Efficiency	Lighting		SSP Smart Start		\$862.44
8005121-02-9-4			Elem. School	461 Sagamore	building	meter		G - 3 Phase		\$41,515.00
5613314036	990701009	S36498323	Middle Sch.	501 Wash. Rd.	building	meter		G - 3 Phase		\$33,120.90
	738601004		Middle Sch.	501 Wash. Rd.	area light			OL 3500L Merc.	\$210.66	included
56799311030	314480001	G46461028	Water	60 Sagamore	office bldg.	meter		G - 3 Phase		\$1,514.86
56996290078	219460009	W01868141	Water	Garland Rd.	pump station	meter		G - 3 Phase		\$9,519.58
	867460002		Water	Garland Rd.	area light			OL 3500L Merc.	\$210.66	included
56928290055	586560006	D74779790	Water	BailBrk/Cedar	pump station	meter		G - 3 Phase		\$13,340.96
56470341041	379501002	G99215318	Water	Breakfast Hill	tank	meter		G - 1 Phase		\$258.54
56461341000	038601001	S54098062	Water	Wash. Rd.	booster pump	meter		G - 3 Phase		\$3,705.30
56153311055	161480006	G82313378	Rye Beach	Sea Road	post lights	meter		G - 1 Phase		\$277.61
56086980091	160260002	G46581991	Rye Beach	Central Rd.	post lights	meter		G - 1 Phase		\$329.81
56944931021	970301002	G42707384	Rye Beach	Central Rd.	post lights	meter		G - 1 Phase		\$325.89
56296201031	636370002	W58743026	Rye Beach	Central Rd.	post lights	meter		G - 1 Phase		\$235.21
56223141037	777401008	G93925120	Rye Beach	Central Rd.	post lights	meter		G - 1 Phase		\$202.60
56788980050	826260001	G31768584	Rye Beach	828 Central Rd	building	meter		G - 1 Phase		\$314.45
56205541006	225801007	G93213438	Rye Beach	South Rd.	post lights	meter		G - 1 Phase		\$321.21
56807201017	99370008	G90605373	Rye Beach	Church Rd.	post lights	meter		G - 1 Phase		\$214.66
8001074-01-6-7			Rye Beach	Central Rd.	streetlights		various	OL - various		\$1,587.85
8001075-01-4-1			Jeness Bch	district	69 street lights		various	OL - various		\$15,000.00

