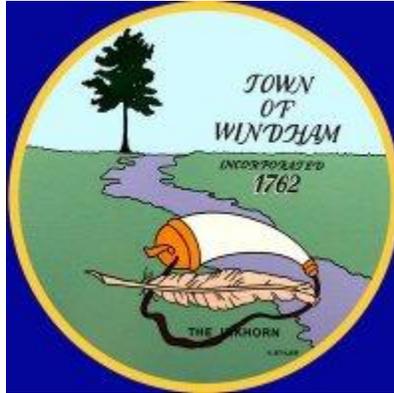


Windham Energy Committee Town Energy Plan



Prepared for the Town of Windham, Maine
by the Windham Energy Committee

with assistance from



the Greater Portland Council of Governments

May 2011

Introduction

In early 2010 Windham applied for and received a Template Energy Efficiency and Conservation Block Grant (EECBG) through Efficiency Maine. This grant provided the Town with funding to support energy efficiency planning, outreach and improvements. The Windham Energy Committee (WEC) was formed in order to implement this grant, and met for the first time in October of 2010. Staffed by Windham Assistant Town Planner Ben Smith, the group is composed of Windham residents with experience and/or interest in the field of energy efficiency, building engineering, heating, cooling and ventilation, and fleet management.

Windham contracted with the Greater Portland Council of Governments (GPCOG) to assist the WEC in creating an energy use, emissions and cost inventory of the Town's municipal operations. The inventory found that the majority of Windham's energy use in 2009 was due to its vehicle fleet, which consumed over 60 percent of the total energy used – nearly double the energy used by Windham's municipal buildings. The Town spent over \$320,000 on its energy use in 2009 – nearly \$134,000 for building energy, over \$128,000 for vehicle fuel, and \$59,000 for street and traffic lights. The WEC used this inventory to identify areas within Windham's municipal operations where potential for energy-efficiency improvements and cost savings may exist.

The Windham Energy Committee Town Energy Plan outlines Windham's current energy use situation, the WEC's future goals regarding energy use, and the specific recommendations and actions that should be taken to achieve those goals. This plan presents the Town of Windham with the opportunity to take control of its energy use, improve the Town's economic and environmental resilience, and reduce the financial burden of high energy prices on its citizens and operations.

This Town Energy Plan contains three components:

- 1) A summary of the 2009 Windham Municipal Energy Use and Emissions Inventory
- 2) A brief list of the WEC's energy-related goals for the Town
- 3) Focused, high-priority recommendations for the Town to improve the energy efficiency and cost-savings of its operations

The Windham Energy Committee looks forward to the opportunity to assist the Town in improving the efficiency and cost-effectiveness of its operations. Many of the high-priority recommendations identified by the WEC are no- or low-cost policy changes or improvements that should provide quick return on investment. For some of the larger efficiency projects identified, the WEC applied for and received a second EECB Grant, providing over \$36,000 for project implementation. When complete, these projects are expected to save Windham over \$18,000 in energy costs every year, which could be put towards further energy and cost-saving improvements in the Town's operations.

In addition, some community outreach to Town residents is required as part of both Efficiency Maine's EECB Grants, and adoption of the PACE ordinance. The WEC feels it is well-positioned to help the Town increase awareness about energy issues, and engage the Windham community through a variety of local energy and cost-saving projects.

2009 Windham Municipal Energy Use and Emissions Inventory – Executive Summary

Background

This report is a summary of greenhouse gas emissions and energy use for the Town of Windham, ME for the year 2009. The focus of this report is the municipal operations of the Town, with special emphasis on Town-owned buildings. It does not encompass residential, commercial, or industrial energy use. The Greater Portland Council of Governments (GPCOG) prepared this report using data collected from various sources within the town by the Windham Energy Committee (WEC).

Understanding of how energy is being used for municipal activities is valuable because it allows towns to examine their facilities, vehicles and activities for potential improvements in efficiency and cost savings. With this baseline, Windham will also be able to calculate energy and emissions savings from future energy efficiency improvements and alternative energy projects. Improvements in the energy and operational efficiency of Windham’s buildings and vehicles will result in energy, emissions and cost savings for the Town.

Findings

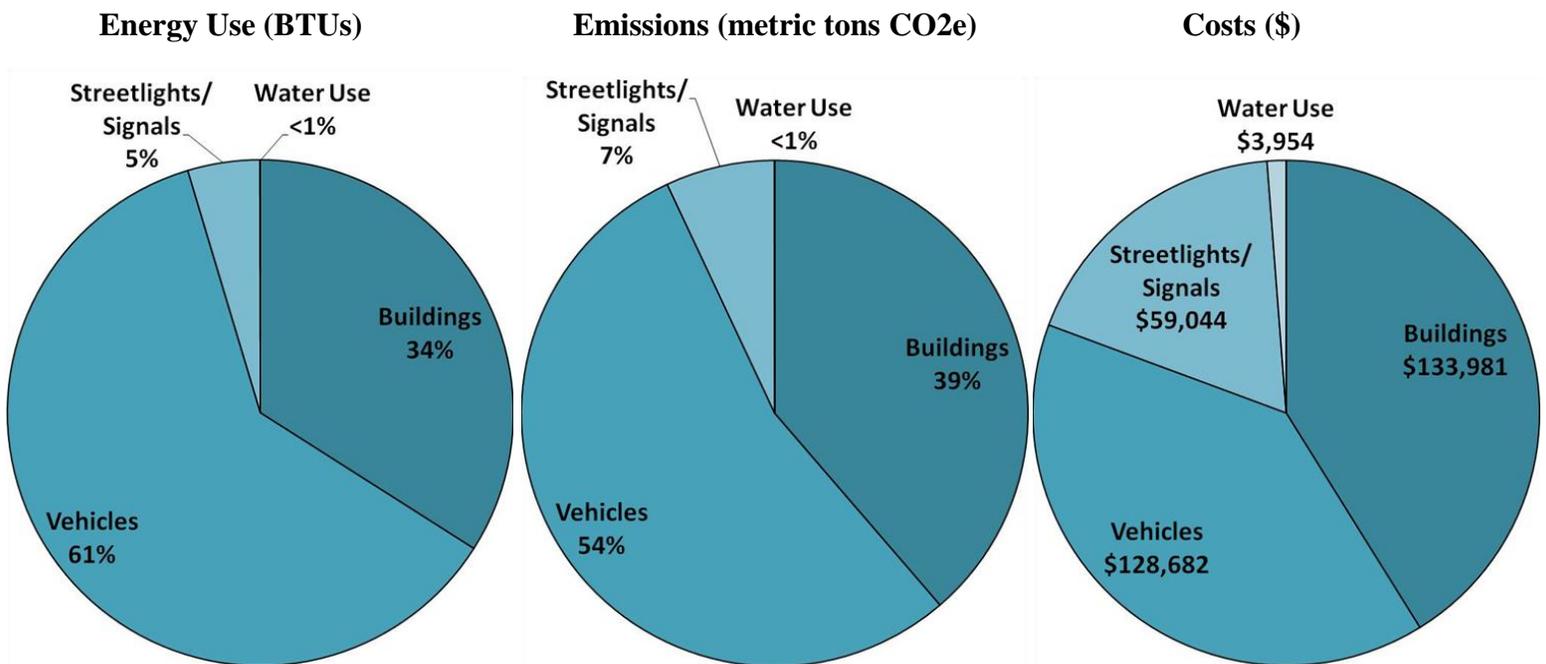


Figure 1. 2009 Windham municipal energy use, greenhouse gas emissions, and costs, by activity

The majority of Windham’s energy use was due to its vehicle fleet, which consumed over 60 percent of the total energy used, with municipal buildings only using about one-third. However, buildings accounted for 41 percent (\$133,981) of the Town’s energy costs, while vehicles only made up 40 percent (\$128,682). Street lights consumed 5% of the Town’s total energy, but made up 18 percent (\$59,044) of the costs.

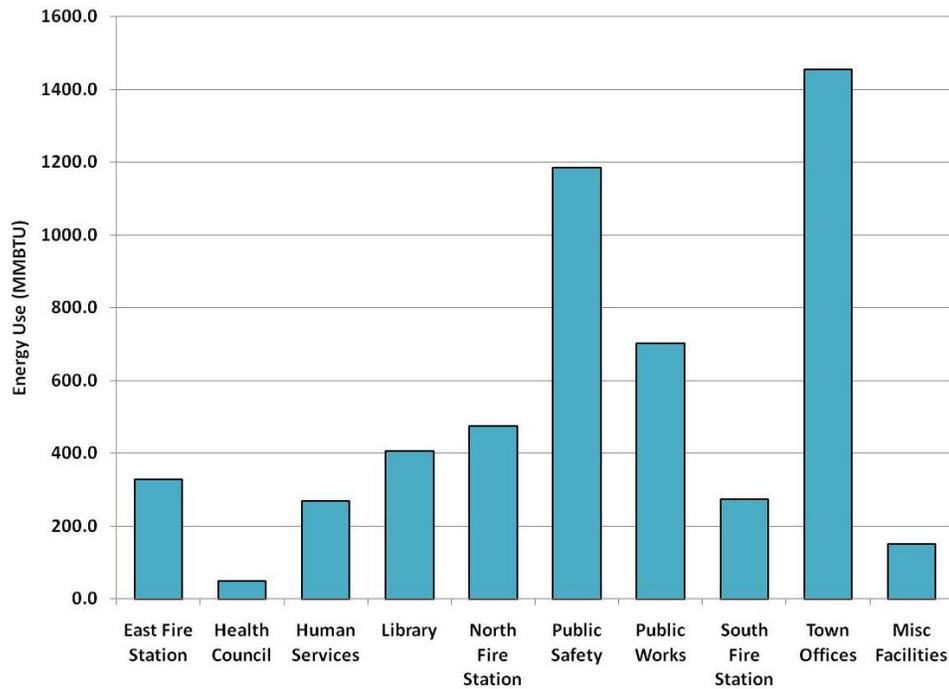


Figure 2. 2009 Windham Energy Use by Building

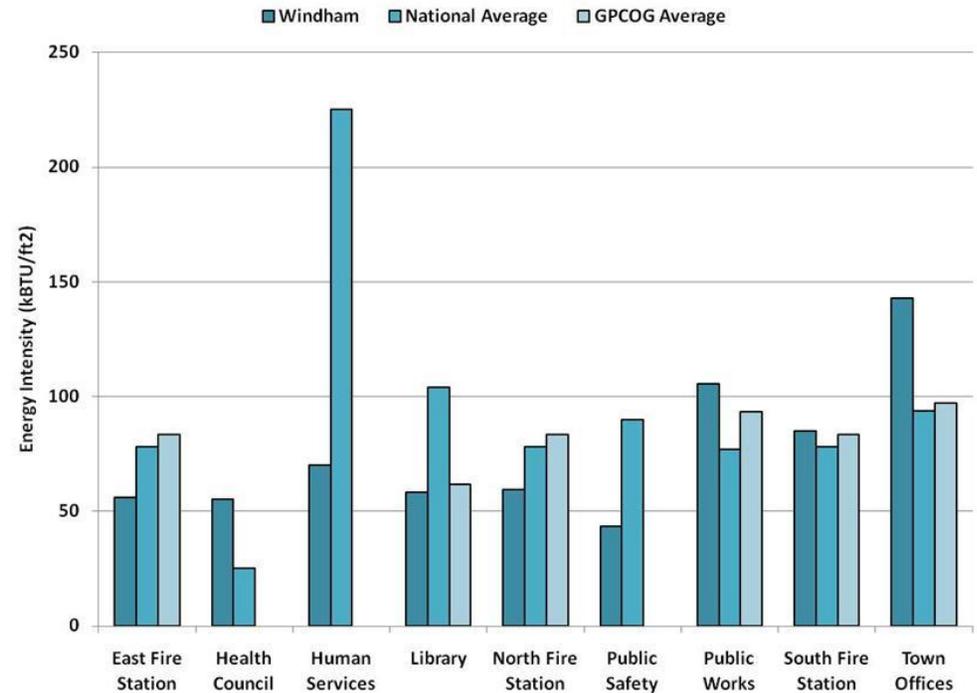


Figure 3. Comparison of 2009 Windham, National, and GPCOG Regional Average Site Energy Intensity by Building

Buildings - Of Windham’s facilities, the major energy consumers were Town Offices, Public Safety, Public Works, the North Fire Station, and Library (Figure 2). When the energy intensities (energy use per square foot) of these facilities are compared, Windham’s buildings are generally less energy-intensive compared to similar buildings nationally and regionally (Figure 3). This may indicate relatively good performance. However, both the Town Offices and Public Safety facilities have higher energy intensities than the national average, and may make sense to focus on for additional scrutiny.

Recommendations – Public Works, Public Safety, the Library, and South Fire Station all use electricity for the majority of their energy use. Because electricity is considerably more expensive than most other energy sources per unit of energy, efforts to address these buildings’ energy costs should focus first on electricity use by examining lighting, air conditioning/ventilation, and computer/appliance use. Windham’s Town Offices also use a large quantity of electricity, and cost-saving measures should focus on electricity first. However, the majority of its energy use is for space and water heating, and so targeted assessments of its heating systems and building insulation may also yield improvements in efficiency and cost savings.

This process may be started by conducting walk-through audits of each facility, which could be completed by the Windham Energy Committee. The Library has already received a professional, decision-grade energy audit. This audit provided comprehensive, quantitative evaluations of the Library’s energy use, identified specific energy efficiency improvements, and estimated the cost-effectiveness of their implementation. Many of the other Town facilities would also benefit from similar evaluations.

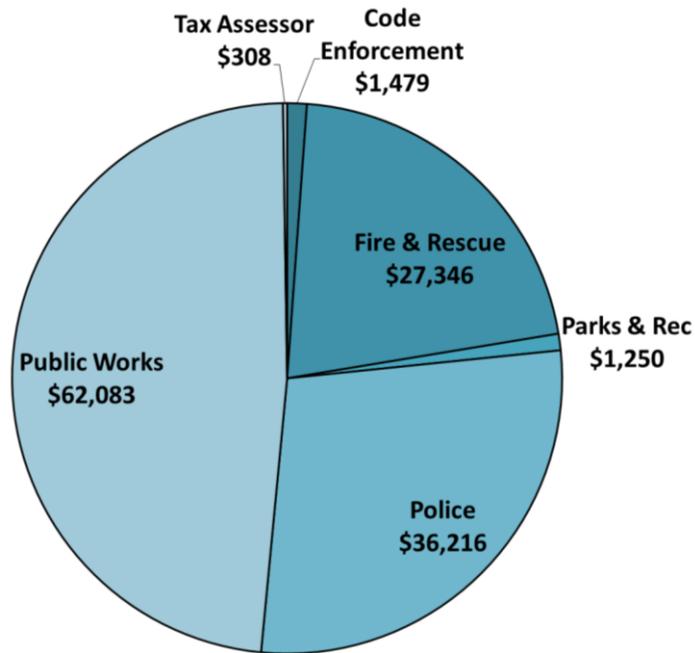


Figure 4. 2009 Windham vehicle energy cost by department

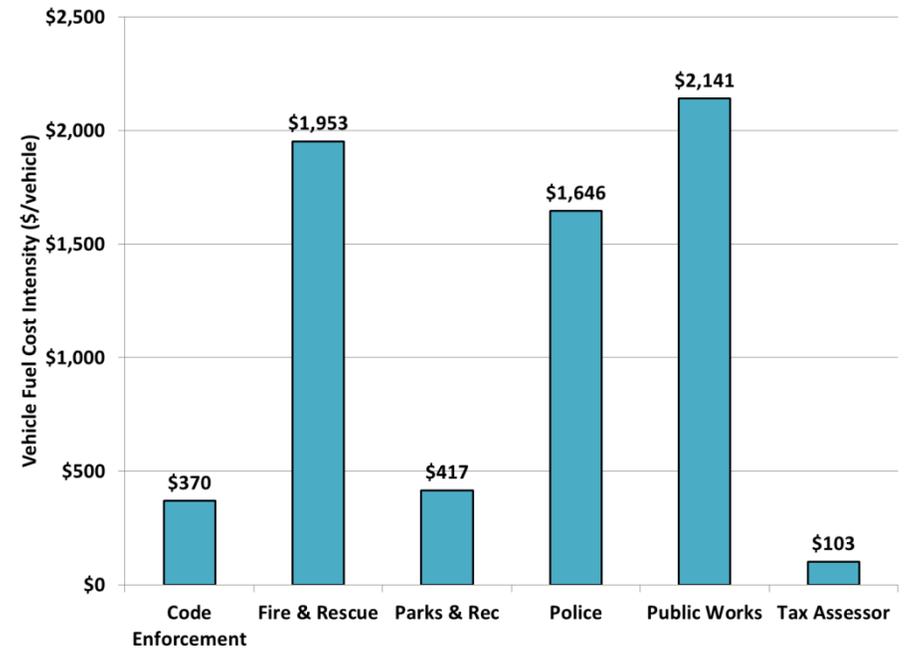


Figure 5. 2009 Windham average vehicle fuel cost intensity by department

Vehicles – Windham has a fleet of 75 vehicles divided among six departments. These vehicles consumed over 70,000 gallons of fuel in 2009, at a cost of nearly \$130,000. Public Works had the highest fuel costs, both overall (Figure 4) and per vehicle (Figure 5); Police and Fire & Rescue were also major consumers.

Recommendations –The Town should begin formally tracking individual vehicle fuel consumption and vehicle use (miles traveled/engine hours), which would allow real-world fuel efficiency calculations to be made for every vehicle in the fleet. These individual vehicle efficiency values could be used to assess which vehicles might benefit most from additional maintenance or replacement.

Working with Town employees from the Public Works, Police and Fire & Rescue departments to solicit and discuss their ideas for reducing fleet fuel use and costs may lead to changes in operational policy and considerable improvements in fuel economy. Implementing a driving log for employees to complete would provide additional vehicle use information, and may serve to reduce unnecessary trips.

Street Lights – Windham’s street and traffic lights accounted for approximately five percent of the Town’s energy use in 2009, but made up nearly 20 percent of costs. Of these lights, the 323 Town streetlights were the largest consumers of energy and most expensive to operate, at over \$165 per light and \$53,443 overall

Recommendations –Conducting a streetlight inventory to identify streetlights which may not be necessary for safety or aesthetics often yields relatively easy cost-savings. Other communities in the region have been successful in reducing their total street lights by up to 25 percent.

Windham Energy Committee Goals for the Town

The following goals have been identified by the Windham Energy Committee to guide their future work:

- The establishment of the Windham Energy Committee as a formal Town Committee
- The creation of a group of School Department officials, staff and employees, tasked with identifying and implementing energy efficiency and cost-saving measures for school operations, and coordinating efforts with the Windham Energy Committee
- The initiation of ongoing Windham municipal energy use and costs tracking relating to energy use in Town buildings, vehicles and street lights
- The initiation of accurate tracking of Windham municipal energy and cost savings due to completed energy efficiency and conservation improvements and policies
- Involve Town staff and employees in discussions about saving energy and costs
- Successful outreach and education of Windham residents, business owners and employees about energy use and costs (*Community outreach is a required component of the EECB grants, and the PACE ordinance)
- The completion of a formal inventory of Windham streetlights operations and costs, and the identification of any potential energy and cost-saving changes to Town streetlight operations
- The completion of walk-through audits and focused evaluations of all Windham municipal buildings
- The completion of professional, decision-grade audits of Windham buildings with greatest potential for energy and cost savings (as identified by walk-through audits)
- The completion of energy and cost-saving lighting upgrades in all Windham municipal buildings, as previously identified by Windham Public Works employees
- Utilize grants, rebates and other financial incentives from Efficiency Maine and other resources in order to support municipal energy efficiency upgrades

Windham Energy Committee Priorities and Recommendations for the Town

The list below represents priority energy- and cost-saving recommendations developed by the Windham Energy Committee. These recommendations are based on the results of the 2009 Windham Municipal Energy Use and Emissions Inventory, and the professional audit of the Windham Library. Details about these recommendations may be found in the attached Municipal Inventory Report – relevant page numbers (##) are indicated for most items.

Short Term (0-6 months)

Operations & Policies

- **No Cost:** Track individual vehicle fuel consumption, and implement driving logs for Town vehicles (30-31)
- **No Cost:** Enter monthly energy bills and vehicle records into spreadsheets for easier analysis and consistency in data measured over time (25)
- **No Cost:** Purchasing policy – prioritize Energy Star equipment (25) and fuel-efficient vehicles (32)
- **No Cost:** Lifetime efficiency and payback taken into account in capital purchases (32)
- **No Cost:** Create a standing Energy Committee, with appointed members, tasked with identifying and implementing energy efficiency and conservation measures for municipal operations and the residents of Windham
- **No Cost:** Utilization of existing computer power management settings in Town computers (28)
 - Anticipated savings: up to \$40/computer per year, according to EPA

Improvements

- **Grant-Supported:** Upgrade lighting in all municipal buildings (26,27)
 - Anticipated savings: **\$11,804 per year**
- **Grant-Supported:** Connect North Windham Fire Station to natural gas (25,27-28)
 - Anticipated savings: **\$3,795 per year**
- **Grant-Supported:** Make audit-recommended efficiency improvements to Library
 - Anticipated savings: **\$2,716 per year**
- **Low Cost:** Eliminate unnecessary large appliances in all buildings (26)
- **Investment:** Install additional waste oil storage capacity at Public Works garage
- **Investment:** Install electricity sub-meters in Town Hall and Public Safety to improve consumption monitoring (26,28)
- **Investment:** Conduct municipal building walk-through assessments, and additional energy audits as needed (29)

Medium Term (6-18 months)

Operations & Policies

- **Low Cost:** Eco-driving workshops for all Town drivers (31)
- **Low Cost:** Annual staff training on efficiency/conservation, and ongoing support (25)
- **Investment:** Roll funds from energy savings into a fund for the Council to pay for future energy improvements
- **No Cost:** Examine streetlight policy and streetlight inventory, with goal of reducing the number of streetlights (32)
- **Low Cost:** Send Town facility manager to Efficiency Maine's Building Operator Certification Training (29)
- **No Cost:** Commit to and support Energy Committee's community outreach and education efforts for residents and businesses
- **No Cost:** Designate a staff person in each municipal building to complete regular, simple walk-through audits of the building
- **No Cost:** Create a school department energy committee, or at least appoint a school department staff member to the Windham Energy Committee.
- **No Cost:** Anti-idling campaign (municipal and public) (31)
- **No Cost:** Become a New England Carbon Challenge Organizer, and host a Community Carbon Challenge in Windham

Improvements

- **Investment:** Evaluation of ventilation system at Garage and Salt Storage buildings (27, 28)
- **Investment:** Install IdleRight idle-management systems in town vehicles as identified (31)

Long Term/Ongoing

Operations & Policies

- **Low Cost:** Review Comprehensive Plan & Zoning for inconsistencies with energy reduction goals & modify as appropriate (25)
- **No Cost:** Implement program for upgrading street lights

Improvements

- **Investment:** Town-wide energy monitoring system to monitor performance of HVAC, lighting and electrical systems in town building (30)

Appendix