Town of Belchertown

Municipal Energy Efficiency

CASE STUDY

BACKGROUND

Several years ago, Belchertown, located in western Massachusetts bordering the Quabbin Reservoir, was struggling to meet budgets due to rising energy costs for municipal facilities. When the Green Communities program began, the town saw an opportunity to receive support for energy efficiency projects that would help to control operating costs. The Pioneer Valley Planning Commission (PVPC) assisted Belchertown and other towns in the region with the program application, which required the community to establish an energy use baseline and develop a five year plan to reduce energy use by 20 percent.

AT A GLANCE:

- Population: 14,700
- Size: 55 square miles
- Reduction of municipal energy consumption: 21%
- Annual energy cost savings: $300,000

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- http://belchertown.org

In the spring of 2010, Belchertown was one of the first Green Communities designated by DOER. The Department of Public Works (DPW) Director and his Administrative Assistant have coordinated participation in the program, in cooperation with the Facilities Director for the School Department, which accounts for the majority of the town's energy consumption.

ACTIONS

Belchertown has reduced its energy consumption through wide ranging improvements to its aging town facilities.

Municipal bonds – Belchertown issued municipal bonds to fund implementation of energy efficiency measures.

Contract with an energy service company – With assistance from PVPC, Belchertown selected and hired an energy service company (ESCO). The ESCO identified and implemented most of the energy efficiency measures described below, guaranteeing annual energy savings levels over the 20 year contract period. Each year, the ESCO will verify the savings achieved and reimburse the town if the guaranteed levels are not met.

Energy audits – The ESCO began their work by auditing all town buildings and developing a proposal of recommended energy efficiency measures.

Energy efficiency measures

Belchertown has implemented energy efficiency measures in every major town facility. These were funded through a combination of municipal funds, Green Communities grants from DOER, Mass Save® rebates, and federal grants through the 2009 American Recovery and Reinvestment Act. While most measures were implemented by the ESCO, the town has recently put a Green Communities grant toward additional work that wasn't part of the ESCO contract.

- **Interior lighting upgrades and controls** – Belchertown has upgraded to energy-efficient lighting in many buildings, including the Town Hall and schools. In several areas, occupancy sensors have been installed to automatically turn lighting on and off based on occupancy.
- **Exterior lighting upgrades** – The town has upgraded lighting outside the wastewater treatment plant to energy efficient LED technology.
- **Weatherization** – Belchertown has done weatherization work, such as air sealing, in most town buildings.
- **Storm windows** – New exterior storm windows were installed to reduce heat loss in two buildings.
- **Water efficiency** – Belchertown has installed efficient plumbing fixtures in schools to reduce use of water and fuel for water heating.

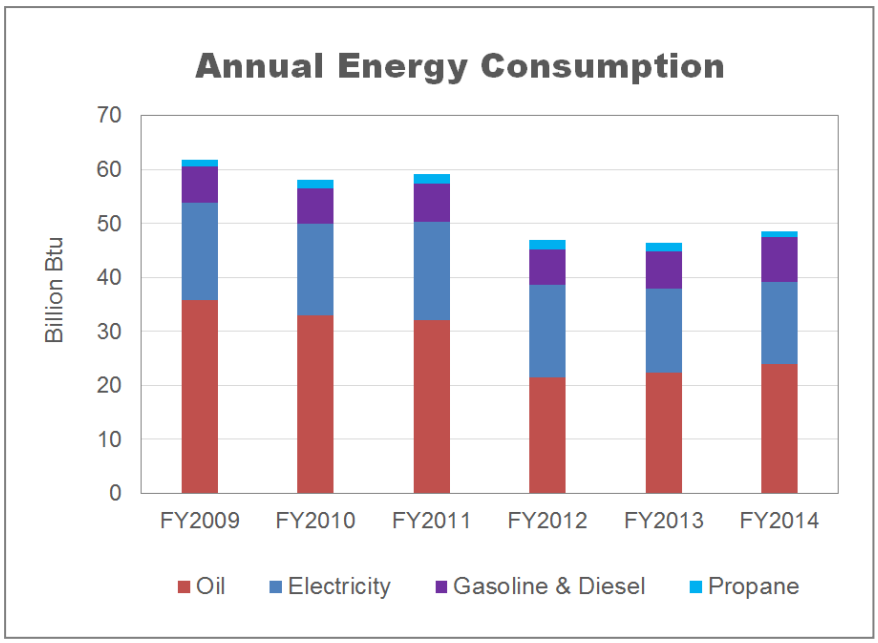
Employees record vehicle mileage when refueling, as part of Belchertown's vehicle fuel management program

- **HVAC upgrades and controls** – Several measures have been implemented to reduce electricity and oil use in heating, ventilation and air conditioning (HVAC) systems, including:
  - Installation of new, efficient natural gas boilers in place of outdated oil boilers in several buildings, including Town Hall and some schools
  - Installation of an energy management system to provide centralized control, scheduling and monitoring of HVAC systems in several buildings, including Town Hall and most of the town's schools
  - Replacement of several basic thermostats with smart thermostats that are programmed to set back heating or cooling based on the occupancy schedule and can be accessed remotely to make adjustments
  - Installation of a heat recovery loop at a school to make use of waste heat rather than rejecting it through the cooling tower
  - Installation of variable frequency drives to adjust the speed of the motors driving fans and pumps to match output requirements
  - Upgrades to high efficiency motors
- **Refrigeration controls** – Automated control systems were installed to improve the operating efficiency of walk-in coolers in the school and senior center kitchens.
- **Vending machine controls** – In the Town Hall, police station and schools, Belchertown installed controllers that optimize energy use by putting vending machines into a low power mode when the area is not occupied.
- **Wastewater treatment plant improvements** – Variable frequency drives were installed to adjust motor speeds to match output requirements.
- **Vehicle fuel management** – In 2015, Belchertown began a pilot program that combines technology and behavior to attempt to reduce gasoline and diesel fuel use by the town's vehicle fleet. A new electronic fuel management system installed at the DPW facility requires staff to insert a vehicle-specific key and type in the vehicle's current mileage when refueling. The system then tracks miles driven and fuel use for each vehicle. Reports are sent to each department detailing their efficiency and reminding them of ways to improve performance, such as checking tire pressure and reducing idling.

RESULTS

Belchertown was one of the first communities to achieve the Green Communities program's energy reduction goal, reducing municipal energy consumption by 21 percent from 2009 to 2014. The town has reduced its annual energy costs by approximately $300,000 to date.

Previously, several facilities had outdated equipment that had become unreliable or difficult to maintain, such as the oil boiler that was original to the 1920s Town Hall, and the town struggled with funding to make needed improvements. Green Communities grants and utility incentives have helped Belchertown to modernize its facilities, while investing in energy efficient equipment that will reduce operating costs for years to come.



RECOMMENDATIONS

Take advantage of assistance available from organizations such as regional planning agencies. Support from PVPC has been critical to Belchertown's success in reducing its energy consumption. PVPC has assisted throughout the process, including developing the energy reduction plan, completing the Green Communities program application, and hiring the ESCO and managing their contract.

Consider hiring an ESCO and owner's agent if municipal staff availability and expertise is very limited. Belchertown was able to have so many energy efficiency measures implemented in a short period by hiring an ESCO to do much of the work. Using a third party owner's agent, funded through a grant from DOER, facilitated the procurement process for the ESCO.