

Town of Arlington

Municipal Energy Efficiency



CASE STUDY

BACKGROUND

The Town of Arlington, located six miles northwest of Boston, has a longstanding commitment to sustainability. In 2000, the Board of Selectmen pledged to develop a climate action plan and reduce the town's contribution to climate change with their vote to join Cities for Climate Protection. Town Meeting adopted the Arlington Sustainability Action Plan in 2006.

Steps taken as part of the Sustainability Action Plan set the stage for Arlington to be one of the first Green Communities designated by DOER in the spring of 2010. One of the criteria to earn designation in the Green Communities program is to establish an energy use baseline and develop a plan to reduce energy use by 20 percent within five years.

The town considered hiring a staff person to coordinate this effort on a part-time basis, and through discussions with the Metropolitan Area Planning Council (MAPC), the Town Manager learned that the nearby town of Bedford was in the same position. Early in 2013, Arlington and Bedford partnered to hire a Regional Energy Manager to serve both towns, and then in 2015, the position expanded to be full-time in Arlington.

ACTIONS

Arlington has focused many of its efforts on heating, ventilation and air conditioning (HVAC) equipment upgrades and use of control systems to optimize operation of HVAC and other equipment.

Energy audits – Many of the energy efficiency measures implemented in Arlington have been identified by the town's Energy Manager and Facilities Superintendent by combining their respective knowledge of energy efficiency and the town's facilities. ASHRAE Level 2 audits of a few buildings provided more in-depth analysis and identified additional measures. Arlington's utility companies paid for audits of Town Hall and an elementary school, and the town and utilities split the cost to audit the library.

Energy efficiency measures

Arlington's energy efficiency measures have been funded through a combination of municipal funds, Green Communities grants from DOER, and Mass Save® rebates. The town typically prioritizes measures with a simple payback period of less than five years but also considers the environmental impact of each potential measure.

- ♦ **HVAC upgrades and controls** – Arlington has made extensive improvements to HVAC equipment in town facilities, including:
 - Installation of new, efficient natural gas boilers in place of outdated oil boilers in the library and several schools
 - Installation of energy management systems (EMS) to provide centralized control, scheduling and monitoring of HVAC systems in the library and most of the town's schools
 - Upgrades of fan motors to properly sized, energy efficient models
 - Installation of variable frequency drives to adjust motor speeds to match output requirements
 - Demand control ventilation in the middle school cafeteria, which automatically adjusts the amount of outside air let into the building to ensure that the right amount of fresh air is provided while optimizing energy use
- ♦ **Steam system maintenance** – Arlington has replaced failed steam traps to avoid wasting steam in schools.

AT A GLANCE:

- ♦ Population: 42,800
- ♦ Size: 5.5 square miles
- ♦ Reduction of municipal energy consumption: 21%
- ♦ Annual energy cost savings: \$354,000

LEARN MORE:

- ♦ <http://arlingtonma.gov/i-want-to-/green-arlington>



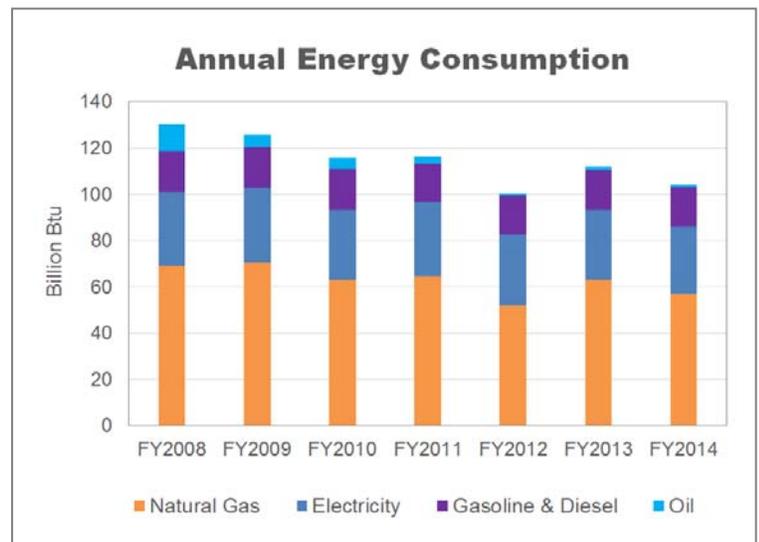
Energy use has been reduced by nearly 40% in Arlington's library

- ◆ **HVAC system testing and monitoring** – After upgrading HVAC equipment and installing control systems in many buildings, Arlington is working to optimize operation of the control systems. For example:
 - The town has programmed each EMS for planned scheduling exceptions, such as holidays, and is working to make adjustments for unplanned changes in schedule, such as snow days.
 - Staff conduct an annual test of each EMS to ensure that it is controlling HVAC equipment correctly.
 - Arlington conducted a pilot of fault detection and diagnostic (FDD) software for ongoing commissioning of HVAC equipment in an elementary school. This software provides real-time operational data online, detects when equipment is not running properly, and diagnoses probable causes. During the pilot, staff met weekly to review faults, prioritize them, and plan for town staff or a contractor to implement fixes. The town is now implementing FDD at a second school.
- ◆ **Interior lighting upgrades and controls** – Arlington has upgraded interior lighting and installed occupancy sensors to automatically turn lighting on and off based on occupancy in a few buildings.
- ◆ **Exterior lighting upgrades and controls** – The town upgraded much of its exterior lighting to energy efficient LED technology, including street lights, parking lot lights, and exterior lighting at schools and Department of Public Works (DPW) garages. The town also installed sensors outside the DPW administration building to automatically control the lights based on the level of daylight.
- ◆ **Kitchen equipment controls** – The operation of kitchen equipment was improved in some of Arlington’s schools by installing a variable speed exhaust hood and automated refrigeration controls in walk-in freezers.
- ◆ **Major building renovation** – Arlington has considered sustainability as part of recent building renovations. One renovated fire station earned Leadership in Energy and Environmental Design (LEED) Silver certification from the U.S. Green Building Council, and another fire station is in the process of LEED certification. The rebuilt Thompson Elementary School was recognized as a Verified Leader through the Collaborative for High Performance Schools. The building was designed to take advantage of natural light when possible, with light shelves, which reflect daylight deeper into the rooms, and daylight dimming sensors for lighting. It also features occupancy sensors on lighting and efficient plumbing fixtures.
- ◆ **Efficient vehicles** – Arlington has purchased 11 energy efficient vehicles, including a plug-in hybrid car driven by the Town Manager. The town has installed an electric vehicle charging station at Town Hall and is considering installing additional stations in public parking lots.

RESULTS

Arlington was one of the first communities to achieve the Green Communities program’s energy reduction goal, reducing municipal energy consumption by 21 percent from fiscal year 2008 to 2014. The town’s annual energy costs have been reduced by approximately \$354,000 to date. After grants and rebates, the payback period was less than two years for many of the energy efficiency measures.

In 2013, Arlington won DOER’s Leading by Example Award based on its success in reducing municipal energy consumption and encouraging residential energy efficiency and solar energy. The town is continuing its leadership in sustainability with ongoing work to further reduce energy consumption.



RECOMMENDATIONS

Staff the program properly. It was an important step for Arlington to hire an Energy Manager who is dedicated to coordinating the town’s energy efficiency efforts. Due to success with this position and a high volume of work, the position has expanded from two days per week to full-time in Arlington.

Train staff on new technologies. Arlington has found that training is needed to run an EMS effectively. With the help of a grant from the Massachusetts Interlocal Insurance Association (MIIA), the town sent four staff members – the Energy Manager, Facilities Superintendent, Head of Maintenance and Head Custodian – to in-depth training on the EMS that was installed in their facilities.

Network with other communities, and take advantage of support available from regional planning agencies. Arlington has benefited from networking opportunities and assistance provided by the Green Communities program and MAPC.