Town of Natick

Municipal Energy Efficiency

CASE STUDY

BACKGROUND

The Town of Natick, located 18 miles west of Boston, has been a leader in energy efficiency for more than a decade. In 2004, Natick joined ICLEI Local Governments for Sustainability, which required the town to establish a baseline greenhouse gas emissions inventory and set reduction goals. The town's Environmental Compliance Officer then began to implement basic energy efficiency measures such as lighting retrofits, gaining support from other town officials by emphasizing the substantial cost savings potential. Natick's Town Administrator established an Energy Task Force in 2007, and after the success of these early efforts, it was a natural step to participate in the Green Communities designation program when it began.

AT A GLANCE:

- Population: 33,000
- Size: 16 square miles
- Reduction of municipal energy consumption: 20%
- Annual energy cost savings: $387,000

LEARN MORE:

- http://natickma.gov/1187/energy

In the spring of 2010, Natick was one of the first Green Communities designated by DOER. One of the criteria to become a Green Community is to establish an energy use baseline and develop a plan to reduce energy use by 20 percent within five years. The Environmental Compliance Officer led this effort until his retirement, and then the town hired a Sustainability Coordinator.

ACTIONS

Natick has taken a range of actions to improve operation of energy intensive equipment and reduce energy consumption throughout the town.

Energy audits – Natick took advantage of free energy audits provided through its utility company, Eversource. Town staff found the audits conducted in several facilities helpful for identifying energy efficiency measures and providing documentation necessary for grant and rebate applications.

Energy efficiency measures

Natick has implemented a variety of energy efficiency measures, funded through a combination of municipal funds, Green Communities and Leading by Example grants from DOER, and Mass Save® rebates. The town typically prioritizes measures with a simple payback period of less than five years.

- **Exterior lighting upgrades** – Natick converted its street lights and lighting in municipal parking lots to efficient LED lighting.
- **Interior lighting upgrades and controls** – Natick had upgraded much of its interior lighting before the Green Communities program began. Then in 2013, it began to upgrade to LED technology. The town has installed central lighting control systems in the library and high school, as well as occupancy sensors in some facilities.
- **Equipment upgrades** – Natick has replaced several old, inefficient boilers with new, high efficiency models.
- **HVAC controls** – To reduce electricity and natural gas use in heating, ventilation and air conditioning (HVAC) systems while maintaining or improving the comfort of occupants, HVAC controls have been installed in most town buildings, including the following technologies:
  - Energy management systems provide centralized control, scheduling and monitoring of HVAC systems throughout a building. Some systems control lighting and domestic hot water pumps, as well as HVAC.
  - Demand control ventilation automatically adjusts the amount of outside air let into the building to optimize energy use while providing occupants with the right amount of fresh air.
  - Variable frequency drives adjust motor speeds to match output requirements.
- **Domestic hot water system controls** – The town has optimized operation of the domestic hot water systems in several schools by making improvements, such as integrating circulating pumps into the building's energy management system or installing timers to turn pumps off when the building is closed.
- **Water system improvements** – Following an audit of Natick's water and sewer system, the town implemented improvements throughout the system. These include upgrading to high efficiency motors on wells and sewer pumps, installing variable frequency drives on pumps, installing controls on heaters in pumping stations, and replacing block heaters for backup generators in the water treatment facility with energy efficient heat pumps.

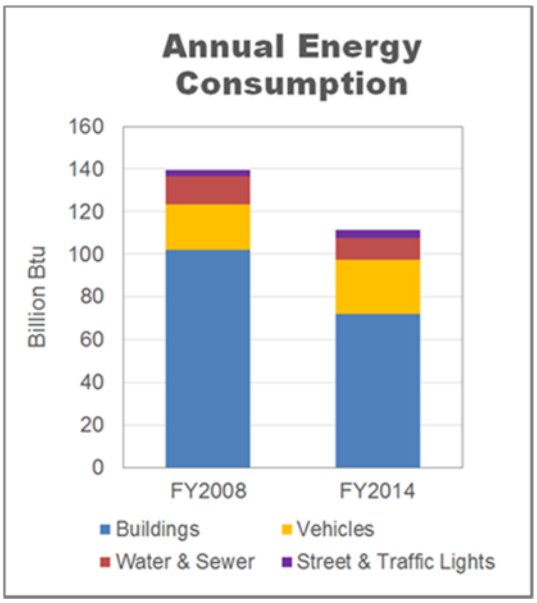
- **Building monitoring** – Natick is retrocommissioning the control systems in several buildings, including schools, the library and senior center, based on performance monitoring data. The town hired a consulting company to collect detailed data on operation and energy use of specific equipment by installing meters on circuit panels. This data can be used to identify operational issues that waste energy, some of which can be corrected by the town's facilities staff at little or no cost. Staff have real-time online access to this data and receive quarterly reports with analysis and recommended energy efficiency measures. For example, monitoring showed that many of the lights were on in the library when the building was closed. Further investigation showed that more lights than necessary had been designated as emergency lighting, and the town has seen substantial energy savings by simply reprogramming the control system.
- **Ice rink upgrades** – Natick leases an ice rink and as part of the contract, the town requires the operating company to reduce energy use. Upgrades have included LED lighting, better insulation, building controls and a more efficient cooling system.
- **Efficient vehicles** – Natick has selected several energy efficient models when replacing municipal vehicles, purchased one electric vehicle, and is in the process of installing an electric vehicle charging station.

Behavioral program in schools – Natick recently began a pilot program to reduce wasted energy in schools. They are working to educate students about their classroom's energy use and engage them in reducing it, using live monitoring technology that will display energy consumption data and show the impact of behavioral modifications.

Pay-for-Performance utility program and municipal energy efficiency fund – In 2014, Natick began to participate in Eversource's Pay-for-Performance program. The town has used the circuit-level monitoring described above to identify energy efficiency measures that can be implemented at little to no cost. After implementation, Eversource pays an incentive based on the amount of verified energy savings. Natick is directing these incentives into a revolving fund for future energy efficiency and renewable energy projects.

RESULTS

Natick was one of the first communities to achieve the Green Communities designation program's energy reduction goal, reducing municipal energy consumption by 20 percent from fiscal year 2008 to 2014. The town's annual energy costs have been reduced by approximately $387,000.



Sustainability is an ongoing priority in Natick, so the town is setting new sustainability goals for the future and working to continue its leadership in making municipal operations more energy efficient.

RECOMMENDATIONS

Staff the program properly, and engage municipal staff and leadership. Natick's success has been led by a dedicated staff person who is responsible for environmental efforts, including the town's participation in the Green Communities program. Facilities and procurement staff have been valuable partners and should be involved in projects starting from the development stage. The town's Energy Task Force, which includes the Town Administrator, Facilities Director, Director of Public Works, Equipment Maintenance Supervisor, School Department Financial Director and Procurement Officer, has provided key leadership of these efforts. The Town Administrator has demonstrated that this work is a priority for the town by personally chairing the Energy Task Force and having the Sustainability Coordinator report directly to her.

Develop a strong relationship with the utility. Eversource has worked closely with Natick on its energy efficiency efforts and provided incentives totaling over $435,000. If a project is put on hold because of insufficient funding, Sustainability Coordinator Jillian Wilson-Martin recommends letting the utility know because they may have some flexibility in incentive levels.

Consider opportunities in every facility. Natick High School was LEED Silver certified and only a few years old when an energy audit found a significant efficiency opportunity in exhaust fans that were running continuously.

Use the pre-approved vendor list. Natick has expedited implementation of energy efficiency projects by following the state's simplified procurement process, defined in Chapter 25A of Massachusetts General Laws, for hiring pre-approved vendors to implement energy efficiency projects costing up to $100,000.

Network with other communities. Natick's Sustainability Coordinator has been actively involved in events held by the Green Communities Division and organizations such as the Metropolitan Area Planning Council, which provide valuable opportunities to network with and learn from other communities.