



CASE STUDY

# Town of Medway



**Solutions: Decarbonization,  
Energy Efficiency**

## CLIENT OVERVIEW

The Town of Medway, located in Massachusetts, serves as a municipal center for its community with key buildings, including the High School, Library, and Police Station. In 2020, the Town sought to improve the energy efficiency of these facilities to reduce operational costs and enhance sustainability. Environ Energy was tasked with identifying and implementing energy efficiency improvements for these buildings, aiming to reduce energy consumption, lower utility bills, and increase operational reliability.

## GOALS

The primary objectives of the energy efficiency upgrades were:

- Reduce Energy Costs: Decrease electricity and gas usage across all three buildings, resulting in long-term savings.
- Enhance System Efficiency: Replace outdated HVAC systems with modern, energy-efficient equipment.
- Improve Building Comfort: Ensure that energy savings did not come at the cost of indoor air quality or comfort levels for building occupants.
- Leverage Utility Incentives: Utilize available financial incentives from the Massachusetts Green Communities Grants Program and Eversource Energy Efficiency Programs.

## SNAPSHOT

128,000 kWh

9,000 Therms

\$29,000 annual energy cost savings

Full regulatory compliance with Eversource Electric and Gas Energy Efficiency Program Standards

18.4% reduction in CO<sub>2</sub> emissions

## OPPORTUNITY

The Town of Medway faced persistent challenges with its outdated HVAC systems:

### High School

- Inefficient Air Handling Unit Fans: The fans operated at full capacity, regardless of need, leading to excessive energy use.
- Overactive Kitchen Ventilation: The kitchen hood ran at full capacity at all times, consuming unnecessary energy.

### Library

- Outdated Rooftop Unit (RTU): The existing RTU was inefficient, requiring replacement to lower operational costs.

### Police Station

- Aging Air Handling Units: The building's air handling units were outdated and inefficient, leading to higher energy consumption.
- Common Challenge: All installations had to be performed without disrupting daily operations, maintaining occupant comfort and building functionality.

## OUR APPROACH

Environ Energy implemented a series of tailored upgrades across each building, designed to maximize energy efficiency while minimizing operational disruptions:

### High School:

- Variable Frequency Drives (VFDs): Installed on two 2-horsepower air handling unit fans (AHUs 7 and 8) to adjust fan speed based on occupancy.
- Demand-Controlled Ventilation (DCV): Implemented for the kitchen hood, using VFDs and controls to modulate fan speed and reduce unnecessary air movement. Installed to eliminate downward gravity movement of air and optimize fan operation based on the need for exhaust. Added to further modulate fan speeds and optimize energy usage.

### Library:

- RTU Replacement: Removed the existing low-efficiency RTU and replaced it with a high-efficiency 2.5-ton unit, improving both heating and cooling efficiency.
- Installation: The old unit was removed using a crane, and a new 2.5-ton RTU was installed with an adapter curb on top of the existing foundation.

### Police Station:

- Air Handling Unit and Condensing Unit Replacement: Replaced outdated AHUs and exterior condensing units with newer, energy-efficient models.
- Refrigerant Disposal: Properly reclaimed and disposed of refrigerants in compliance with environmental regulations

## RESULTS AND IMPACT

- Energy Savings: Estimated annual savings of 128,000 kWh of electricity and 9,000 therms of gas.
- Cost Savings: The total annual energy cost savings for the Town of Medway amount to \$29,000.
- Operational Efficiency: The system upgrades resulted in more responsive and efficient HVAC operation across all buildings, with minimal disruption to daily activities.
- Environmental Impact: Reduced energy consumption supports the Town's environmental goals by lowering carbon emissions associated with heating and cooling.
- Compliance with Energy Programs: The project met all technical guidelines set by the Massachusetts Green Communities Grants Program and the Eversource Energy Efficiency Programs.

## STRATEGIC INITIATIVES FOR CONTINUED SUSTAINABILITY AND IMPACT

- Monitoring and Maintenance: Ongoing support to ensure that the energy-efficient systems continue to perform at optimal levels.
- Future Efficiency Upgrades: Identifying additional opportunities for energy savings in other municipal buildings.
- Sustainability Planning: Supporting long-term sustainability initiatives and helping the town stay aligned with evolving energy regulations and environmental goals.

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Environ led a comprehensive energy efficiency upgrade across three municipal buildings in Medway, including the High School, Library, and Police Station. Our team implemented advanced solutions such as variable frequency drives, demand-controlled ventilation, and high-efficiency HVAC systems, significantly improving operational efficiency and comfort while reducing energy consumption.

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<b>Sector(s)</b>	Institutional – Municipal Buildings (High School, Library, Police Station)
<b>Areas of Expertise</b>	Energy and/or Decarbonization Analysis; Design; Professional Services
<b>Customer Goals &amp; Identification Process</b>	The customer requested that Environ identify and implement energy efficiency improvements for three municipal buildings within the Town of Medway in Massachusetts: the High School, Library, and Police Station. The work had to be performed during occupied hours with little to no disruption to building operations and while maintaining comfort conditions.
<b>Integration of Customer Goals</b>	Environ worked with contractors to schedule construction work in a way which would not impact on the operation of the buildings.
<b>Recommendations, Next Steps &amp; Outcomes</b>	<ul style="list-style-type: none"> <li>• High School – Installed Variable Frequency Drives (VFDs) with controls on fans associated with two AHUs to control fan speed based on occupancy. Demand controlled ventilation (DCV) was implemented for the kitchen hood by installing variable frequency drives (VFDs) on the make-up air supply fan and the kitchen hood exhaust fan and instituting controls to reduce the volume of exhausted and made-up air when hood conditions allow.</li> <li>• Library – Replaced the existing low efficiency RTU with a high efficiency RTU with 2.5 tons of cooling and 40 MBH output of heating.</li> <li>• Police Station – AHUs and their associated exterior condensing units were replaced with new more energy efficient models.</li> </ul>
<b>Qualified Personnel</b>	<ul style="list-style-type: none"> <li>• Micheal Reinhold – Design; Professional Services</li> <li>• Christopher Recine – Business Development; Professional Services</li> <li>• Kristine Gill – Energy Modeling; Professional Services</li> </ul>
<b>Firm's Scope of Work</b>	<ul style="list-style-type: none"> <li>• Design/Build for Equipment Replacement</li> <li>• Submitted Utility Incentive Applications</li> </ul>
<b>Customer Reference</b>	<p><b>Name:</b> Stephanie Carlisle  <b>Title:</b> Sustainability Coordinator  <b>Organization:</b> Town of Medway  <b>Phone Number:</b> (508) 533-3275  <b>Email:</b> scarlisle@townofmedway.org</p>
<b>Heat Pump Design Lessons (if applicable)</b>	N/A