



# CASE STUDY

## Nashua School District Scoping Report

EVERSOURCE

Unitil

### Challenge:

Beacon Energy identified significant savings opportunities by uncovering widespread inefficiencies across all four elementary schools. Key areas for improvement included:

- Aging HVAC systems
- Inadequate boiler combustion controls
- Outdated LED lighting
- Insufficient building occupancy controls
- Behavioral factors such as employee habits

### Results:



Beacon Energy identified significant savings opportunities by uncovering widespread inefficiencies across all four elementary schools. Expected annual savings were estimated to exceed **\$75,000** across all four schools.



Key areas for improvement included aging HVAC systems, inadequate boiler combustion controls, outdated LED lighting, and insufficient building occupancy controls. Payback for each school ranged from **2.7 to 10.8 years**, depending on age of system and condition of building.



Beacon was able to secure over **\$96,000** in utility incentives toward most of the Efficiency Measures recommended in the scoping studies. Eversource and Liberty Utilities were proud sponsors of the scoping studies, as they would lead to a reduction in fossil fuel emissions.

### Background:

In 2024, the Nashua School District, the second-largest in New Hampshire, initiated a comprehensive review of the building systems in its four elementary schools. To guide this effort, the district selected Beacon Energy, a regional leader in utility incentives and energy efficiency solutions. With energy prices fluctuating and market uncertainties looming, there was an urgent need to enhance the schools' efficiency. This required a strategic, well-planned approach to evaluating the performance of the building systems—all while staying within budget. Utilizing proprietary tools and a team of experienced energy professionals, Beacon Energy delivered a thorough scoping study, offering a detailed analysis of each of the district's four elementary schools. Remarkably, Beacon was able to complete this work at no cost to the school system. The next phase will involve implementing the recommended energy efficiency measures outlined in the reports.



### Benchmarking:

Benchmarking involves comparing the performance or outcomes of a system, process, or building against its historical energy usage. By aligning with industry standards or best practices, benchmarking helps establish a baseline using performance data from related datasets. In the Beacon scoping studies, the initial step was benchmarking the existing conditions, processes, and costs.



### Scope Analysis:

Beacon used energy modeling with software and computational tools to simulate the performance of energy systems across various scenarios. These models consider factors such as energy demand, system efficiency, and external variables like weather patterns and fuel prices. Energy modeling aids in evaluating different energy strategies, helping identify the most cost-effective and efficient solutions.



### Evaluation:

Beacon used Cost-Benefit Analysis (CBA) to compare the expected costs of an energy project with its anticipated benefits. This approach assessed economic viability and return on investment by evaluating:

- **Capital costs** (e.g., infrastructure, technology)
- **Operating costs** (e.g., maintenance, energy consumption)
- **Benefits** (e.g., energy savings, environmental improvements, increased efficiency)



### E. M. Recommendations:

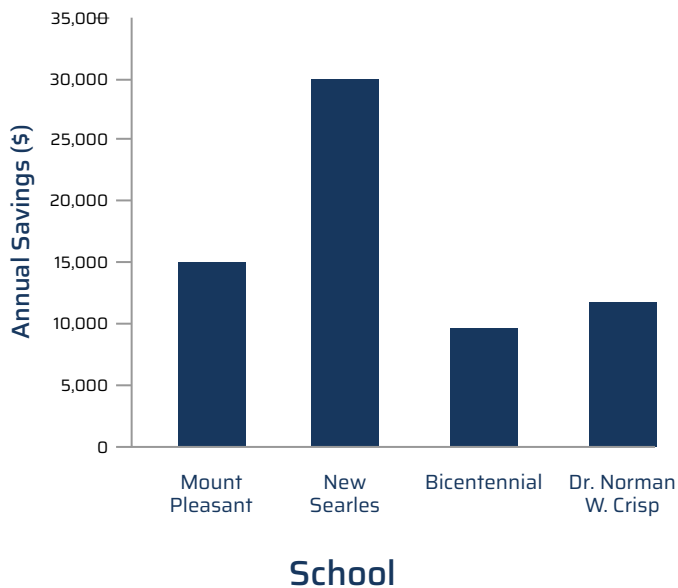
The scoping study identified several efficiency measures that could yield significant savings when implemented. Recommended upgrades included:

- **Energy-efficient equipment:** LED lighting, high-efficiency HVAC systems, and energy-optimized sensors and controls
- **Advanced control systems:** Smart thermostats and building energy management systems
- **Employee training:** Promoting energy-saving practices such as closing doors to large spaces when not in use and optimizing equipment usage

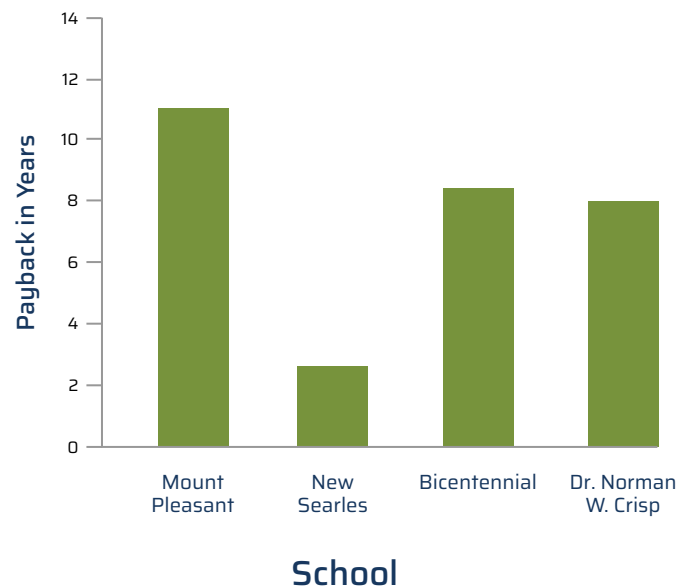
## Investment & Payback Periods

	Mount Pleasant Elementary	New Searles Elementary	Bicentennial Elementary	Dr. Norman W. Crisp Elementary
Total Estimated Cost:	\$183,889	\$110,528	\$103,448	\$107,602
Utility Incentives:	\$17,259	\$29,846	\$25,685	\$23,523
Net Cost:	\$166,630	\$80,681	\$77,763	\$84,350
Annual Savings:	\$8,101	\$29,912	\$9,398	\$11,271
Payback Period:	10.8 years	2.7 years	8.3 years	7.4 years

### Annual Savings by School



### Payback Period by School



## Financial Analysis & Recommendations Based on Energy Savings Report



### Investment Efficiency & Prioritization

#### Highest ROI & Quickest Payback:

- o New Searles Elementary (2.7 years) has the best return on investment.
- o This school should be prioritized for upgrades, as savings will quickly cover costs.

#### Moderate ROI:

- o Bicentennial Elementary (8.3 years) has a reasonable payback period but requires careful budgeting.
- o Mount Pleasant (10.8 years) and Dr. Norman W. Crisp (11.8 years) take longer to break even.



### Utility Incentives & Cost Reduction

Utility incentives significantly lower project costs, reducing net expenses by 20-30% across schools.

#### Recommendation:

Explore additional grants or funding sources to further offset upfront costs.



### Long-Term Savings vs. Short-Term Gains

Schools with long payback periods (Mount Pleasant & Dr. Norman W. Crisp) should implement lower-cost, high-impact measures first.

#### Example:

- o Lighting upgrades & HVAC scheduling changes have short payback periods.
- o High-efficiency boilers require high investment but yield consistent long-term savings.



### Phased Implementation Approach

- o Implement low-cost, high-impact changes first (e.g., HVAC scheduling, lighting upgrades) to start realizing savings early.
- o Then, invest in higher-cost measures (boiler replacements) using the savings from earlier upgrades.
- o This phased approach reduces financial strain while maximizing savings potential.

## Final Recommendations

- o Prioritize New Searles Elementary for immediate upgrades.
- o Consider phased implementation for longer-payback projects.
- o Leverage additional funding & incentives to reduce net costs.
- o Monitor energy savings post-implementation to adjust strategy if needed.