MEDFIELD INSIDER

December 22, 2025

Library Gains Energy Efficiency with New State-of-the-art System



At a recent Medfield Energy Committee (MEC) meeting, members were buoyed by data showing significant benefits gained from the installation of new heat pump roof-top units (RTUs) on the Medfield Public Library building – units that run on electricity with natural gas only as back up for colder days.

A rooftop unit is a self-contained heating and cooling system that uses heat-pump technology for efficient heating and cooling, moving heat rather than generating it. For the library, the new unit replaced six gas-fired units that were more than 20 years old and failing, according to consultant Susan McPhee who has served as Medfield sustainability coordinator since November 2021.

"Heat pumps are so much more efficient with air-conditioning, and what we save on A/C will then be spent on heat. We're using a little more electricity, but not a ton, and all the natural gas is wiped out," she shared with MEC members. "It's really exciting – what we're seeing is sort of a proof in concept…We're a leader in the state on this, so it's something we can brag about."

Data helps with assessment

As further explained by McPhee, the library units were installed in January 2025 and are now generating months of valuable data to show that annual natural gas use has dropped by 99 percent. Furthermore, she notes that while electricity consumption has increased, the town has already gained savings with the project installation, funded primarily by a $145,704 grant, and a Mass Save incentive of $56,250. The town contribution to the total cost of $234,872 was reduced to just under $33,000, according to McPhee.

McPhee stressed that going forward, "There are no cost-savings guarantees. Right now, the economics are looking good, but are price dependent," she said. But beyond energy dollars, McPhee pointed out that Medfield is benefiting from reduced carbon, while gaining greater reliability and increased comfort.

As someone working in the building each day and overseeing its operation, Library Director Pam Gardner touted the benefits of the new system, noting, "The thermostats are easy to use and switch seamlessly from heat to cool without even needing to change the settings which is great during the unpredictable New England transitional seasons. The heat pumps are very responsive to temperature changes we need to make, and some of our harder-to-regulate spaces are now much more comfortable!"

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Gardner shared she was interested in seeing what kind of cost-benefit trends develop over a long span of time, something McPhee has begun to track with three years of historical data to show how energy usage has changed over time at the library.

Using MMBtu (One Million British Thermal Units) to measure combined energy from gas and electricity, McPhee provided the following data:

• In January 2023, the combined MMBtu was 117, with natural gas accounting for 97 and electricity accounting for 20.

• In January 2025, after the installation of the new roof-top unit, the natural gas MMBtu dropped to 0 and electrical use rose to 22.

(A BTU is the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit.)

Future benefits predicted

As McPhee noted, with groups like Mass Save providing incentives to help municipalities and residents afford to install heat pumps and replace fossil fuel systems, she predicts electrical costs will come down over time.

McPhee looks forward to continuing to find ways to increase energy efficiency and project savings in Medfield, as well as in other communities, through her firm Spark Energy Conservation LLC. Managing town applications and projects within the Green Communities Grant Program are her primary areas of focus.

(MEC is sponsoring a "Heat Pump Pizza Party" at 12 p.m. on Jan. 29 at The Center on Ice House Road as part of the Council on Aging "Lunch and Learn" series. COA asks anyone planning to attend the event to pre-register by calling its office at 508-359-3665 by Jan. 27. ***Click here for flyer****.)*

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