## Town of LEVERETT LIBRARY Heating and cooling system replacement Project Narrative

**Project Scope/Purpose**

The Town of Leverett proposes to convert the 5 ground water based air heating and cooling units, which now are using electric resistance heating boosters as their primary heating source, with an efficient air source heat pump system. The Leverett Library was built in 2003 with a ground source geothermal heating and cooling system. Since installation, the geothermal system has required frequent repairs and redesigns every few years to keep it functional. In 2021, the Library decided to put electric heater “boosters” on the units, which had the effect of becoming the primary source of heat for the building over the next winter, causing the building to expend a significant amount of electricity at high expense. The system also failed several times over the past winter causing the library’s community room to close due to lack of heat and generating unplanned and large repair expenses. The Library and Facilities staff and Library Board of Trustees members have again spent this summer examining the alternatives for the system and have agreed that they no longer want to invest in making the now almost 20 year-old geothermal with electric resistance system work, but would rather invest in making the Library an efficient and pleasant place to be with a reliable heating and cooling system.

**Benefits**

A reliable and appropriately-sized HVAC system would provide many benefits to our community. A primary benefit will be reduced electrical use and costs to the town and significantly reduced maintenance costs. Additional benefits include reliable and comfortable facilities regardless of the weather, allowing the Library to be open regularly and to provide all the services it has, such as community meeting spaces, access to technology, information, and connections to social service agencies consistently and on the hottest and coldest days. The Library would avoid closures of meeting spaces due to unexpected repairs and uncomfortable facilities, which occurred over the past winter. In addition, the Leverett Library serves residents who need the resources of the Library from both Leverett and neighboring communities that do not have a comparable facility. The Library is a gathering space for elementary students after school, retired residents who take exercise classes or gather to socialize, story times for young children and their caregivers, concerts by local musicians, lectures, and art exhibits. For a small rural community with precious few public gathering spaces, the Library fulfills a vital role, particularly for the Council on Aging and the Recreation Committee who sponsor classes at the Library. From a monetary stand-point, this improved HVAC system would relieve the unpredictable and expensive burden on the small residential tax-base in Leverett. The high electricity costs and the costs of regular unexpected repairs has been a consistent burden to the community for many years.

**Timeline**

If awarded, Leverett would begin the contracting needed for the project immediately to get a contract in place and the equipment ordered as soon as possible so that the heating and cooling system replacement can be completed in May and the project is totally complete by June 2023.

Action Item Completion Date

Grant Award December 30, 2022

Contracting complete January 31, 2023

Equipment ordered February 15, 2023

Permits secured April 15, 2023

Equipment delivered April 15, 2023

Installation complete May 15, 2023

Project complete June 30, 2023

**Procurement Required**

Leverett plans to utilize an approved Eversource project expeditor to complete the retrofit. The threshold for these types of projects to fall under the MGL Chapter 25A, Section 14 exemption has recently increased, so no additional procurement is required.

The project includes removal and disposal of the existing geothermal units. Specification sheets are included in the Attachments.

**Anticipated impact, qualitatively and quantitatively**

Leverett’s total energy consumption in FY21 at the Leverett Library was 158 MMBTU. For FY 22 this number went up to 167.5 MMBTU. If these numbers are compared to the FY 2009 Baseline year total of 119 MMBTU, the story of the failing geothermal heating system comes to light in numbers. By looking at the attached MassEnergyInsight charts of the Library energy use from FY 2009 to 2022, you can see that the average electricity use for the building stayed somewhat consistent, averaging between 29,000 KWh and 35,000 KWh until FY 21, when in December 2021 the first spike occurred, generating an average annual use of 51,718 Kwh. In FY 22 there is a spike of 50,519 KWh. The use in FY 21 and FY 22 is higher over all the heating months. Electricity is the only source of energy consumed by the building, so assuming that lights, which were switched to LED and do not consume large amounts of electricity, stayed consistent or reduced over the years, the only driver of such increased energy use is the failure of the geothermal system and the energy consumption of electric resistance boosters.

In addition, there will be a huge sense of relief within the Library Trustees who have been working hard for many years to realize the dream of a sustainable and energy efficient facility as described in the Leverett Library Long Range Plan 2020-2025.

**Supporting Leverett’s five-year Energy Reduction Goal**

This project will support Leverett’s continued efforts to reduce municipal energy use by 20% from its baseline year of FY09. The Town applied for and was awarded a Competitive Grant in FY2017 to complete LED retrofits at Leverett Library, Public Safety Complex, and Elementary School. In 2020, the town applied for and was awarded a Competitive Grant to complete a LED retrofit at the Town hall and to purchase the streetlights in town and install LED lamps in them. All of these projects are now complete.

Leverett’s total energy consumption for FY21 was 4,511 MMBtu, including buildings, vehicles, and streetlights. The Library accounts for 3.5% of the total. Although that is a small amount, a reduction in the MMBtus expended by the Library would help the town come closer to its 20% reduction goal.

If the proposed project is implemented to convert the Library heating to efficient air source heat pumps, a 34% energy savings in Library electricity consumption is estimated (calculated by dividing the estimated kWh to be saved from the FY22 rolling average high). This would result in an energy reduction of 17,254 kWh annually, or 58.87 MMBtu. The project will result in an estimated annual energy cost savings of $5,607 (EnergySource amount adjusted to estimated future kWh cost), with a payback period of 17.3 years, not including maintenance savings. Estimated life expectancy of the new equipment is 25 years, exceeding the payback period.

The Town of Leverett has accomplished the following energy conservation projects at the Leverett Library:

* Building envelope work which included weather sealing for four exterior doors
* Programmable thermostats with occupancy sensors
* LED lighting retrofit

Recent audit by EnergySource for this project documents that no additional weatherization needs to be completed in the building (email attached dated 10/7/22).

**Why grant funding is required to complete the project**

Green Communities grant funds are needed because the Town of Leverett is unable to complete this project without assistance. The Library's total FY 23 budget for salaries and expenses is $89,538 and the building’s total facility maintenance budget is $14,600. Neither of those appropriations have extra funds to cover the expense of the new heating and cooling system.

In FY 22, the Library facility maintenance budget was $14,175, but a total of $21,636 was expended due to heating system repairs and electric bills, an additional 52% over the original appropriation. The town cannot afford to continue to maintain the heating system in its current state.

**Required Permits**

The project will require electrical and building permits. A permit will be applied for through the Franklin County Cooperative Inspection Program. The chosen installation contractor will be responsible for applying for and obtaining the necessary permits and inspections.

**Additional Approvals**

No additional approval will be needed for this project.

**Education and outreach**

As a community gathering space and one used for educational purposes, the Library is poised to provide both formal and informal information about this grant and construction project. This would take the form of informational signs in the building, answering questions from patrons who stop at the circulation desk, written information on our website as well as more formal exhibits and speakers. As this community is eager to understand and embrace environmentally sound practices and technologies, it is anticipated that these would be well attended.

Websites used to publish information include the Library’s webpage at https://leverettLibrary.org/ and the “Town News” section of the Town’s website at <https://leverett.ma.us/>. Full project documents will be made available on the Energy Committee webpage at <https://leverett.ma.us/g/45/Energy-Committee>.

**Total Budget**

The total project cost for the conversion as priced by EnergySource is $130,779. Due to the expectation that the project will be implemented in the next construction year, a 3% adjustment has been added to that price for a total cost of $134,700.

A pre-approved utility incentive is estimated at $36,525, which also has had 3% added to equal $37,620.

The Town requests Green Communities funds in the amount of $97,080.

**Other Funding Sources**

No Other Funding sources are expected for this project.

**Applicant and Project Team**

The Leverett Town Administrator will prepare quarterly reports and provide general project coordination and oversight. The Town Administrator, Library Director and Facilities Manager will coordinate project work with the contractor.

**Benefit to Environmental Justice Populations**

The Leverett Library is a public Library. As such, we welcome anyone from any community into our Library building for programs and technology use. The Library is also a member of the CW Mars resource sharing network, which means that we offer services and materials to any CW Mars Library card holder. Four of our neighboring towns have Environmental Justice populations including Wendell, Sunderland, Montague and Amherst. Having comfortable and reliable facilities in Leverett could benefit these populations who also use the Leverett Library services and facilities.

Another environmentally vulnerable population that Leverett has in large numbers is elders. As the number of projected days over 90 degrees F increases with time (as predicted by the Mass Dept of Public Health Bureau of Environmental Health), the elder residents of town will experience a much higher risk exposure. According to the September 2022 Discovery Report Needs Assessment for the Elder Population of Leverett, MA, 47% of Leverett residents currently are over age 50 (page 37), and trends show that this number is growing. The Mass DPH report notes that “Older adults, especially those living alone, are more vulnerable to health impacts during extreme heat events.” (<https://dphanalytics.hhs.mass.gov/ibmcognos/bi/?perspective=authoring&pathRef>

=.public\_folders%2FMEPHTN%2Fcommunity%2Fcommunity-profile). Elders use the Library in great numbers and the Library provides a welcoming environment for elders to seek assistance with technology and connecting with support services. The Library maintains resources and information to support elders and Library staff are educated on where to refer elders. Keeping the Library building open and at a comfortable temperature during extreme heat events will help this vulnerable population.

**Additional Materials are attached:**

Grant Table

Certificate of Application

Specification Sheets on 3 and 4 ton American Standard units

Specification sheet for controls

Specification Sheets for 3 and 5 tom air handlers

Certificates of Product Ratings for 3 and 4 ton units

Energysource Project Proposal

Energysource saving calculation (excel spreadsheet)

MassEnergyInsight 2009-2022 Library Electricity Use charts

Energysource email confirmation regarding weatherization measures