

Green Communities Competitive Grant Application Town of Burlington

Project Narrative

February 2020

Prepared for:

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Relation to Energy Reduction Plan

The Town of Burlington is a Middlesex County community situated on the watersheds of the Ipswich, Mystic, and Shawsheen rivers. This 11.9 square-mile community has an estimated population of 24,498. Municipal energy is consumed in the form of electricity, natural gas, heating oil, gasoline, and diesel. The Town was designated as a Green Community in February 2020.

The Town’s 2019 Energy Reduction Plan showed that buildings account for the greatest use of energy among all municipal uses (about two thirds). Within this building category, the public library was within the top 10 energy users in town, accounting for 1,923 MMBTUs or 1.9% of the town’s total baseline use in 2019. By completing an energy efficiency project within one of the top municipal energy users, the town can efficiently begin to implement the Energy Reduction Plan.

Already in this current fiscal year (FY 2020), the town has undertaken LED lighting measures in several schools. The savings from this measure, 1,432 MMBTUs, are expected to be seen in the building use in Mass Energy Insight in June. Additionally, the Town upgraded and updated thermostats and building controls at the 61 Center Street facility. The town has seen 70 MMBTUs of savings in the first six months since this measure was implemented. The Town anticipates similar savings over the next six months.

This fiscal year, the Town has also installed a new electric vehicle charging station. This project utilizes a grant from the Massachusetts EVIP program and is expected to be operational this year. The charging station is a public facing project that demonstrates the Town’s commitment to energy efficiency and clean energy sourcing.

The total energy consumption by the Town of Burlington in the baseline year (FY2019) was 103,111 MMBTU.

Facility Category	MMBTU Used in Baseline Year	% of Total MMBTU Baseline Energy Consumption
Non-Weather Normalized		
Buildings	68,411	66.35%
Open Space	389	0.38%
Street/Traffic Lights	2,310	2.24%
Vehicles	13,783	13.37%
Water/Sewer/Pumping	18,217	17.67%
Total Non-Weather Normalized	103,111	100%

The Town of Burlington has made a strong commitment to reducing its energy consumption, and this Green Communities funding will enable the Town to implement projects toward this goal.

Project Narrative

Overview

The Town of Burlington is proposing to utilize the total Green Communities Designation Grant funding amount of (\$172,250) to help the town complete an HVAC project at the Burlington Public Library:

- i. Replacement and Installation of Two Energy Efficient Roof Top Units

The town of Burlington is not requesting funding for administrative assistance at this time.

Energy Efficient Roof Top Units at Burlington Library

Background

RISE Engineering performed an energy savings assessment of the current rooftop units at the Burlington Public Library and determined that the existing Roof Top Units should be replaced. The report determined that an appropriate replacement would be two 40-Ton Roof Top Units that have a rating of 10.80 EER and a 15.20 IEER at standard conditions.

The town additionally sought out a second report from Weston & Sampson Engineering which recommended replacement units with an IEER of 13 at standard conditions.

The project proposed for grant funding will replace the existing roof top units (RTUs) with smaller, more efficient units.

In addition to this much needed equipment replacement, the Town of Burlington plans to implement weatherization measures, replacement of building controls, and to support behavioral measures to promote energy efficiency at the Library. The culmination of these measures together will likely have a much bigger impact than the change in equipment on its own.

Energy Savings

Project Energy Savings	Replacement of Roof Top Units	Weatherization identified in Energy Audit
Electric Savings (kWh)	9,746	138
Gas Savings (Therms)		192

Energy Savings (MMBTU)	33.5	19.67
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In FY 2019, the Burlington Public Library used 264,576 kWh. As indicated above, the completed equipment replacement is anticipated to save 9,746 kWh (representing savings of 0.036%) on an annual basis.

Together, the equipment replacement and the weatherization measures would account for annual energy savings of 53.17 MMBTUs. This likely only represents a small percentage of the actual energy savings that will result from this project, since the ratings of the current equipment are unknown, and since additional measures will be included in this project. In the process of the procurement for the new rooftop units and the weatherization measures to support it, the town will get a better estimate of the savings from these two measures.

In addition to those savings, the town plans to update the building controls throughout the Library and is currently supporting a staff member in training on HVAC energy efficiency. The implementation of these measures is expected to further the efficiency of the new equipment at the time of installation, and to ensure energy efficiency minded maintenance on an ongoing basis.

The current equipment is at the end of its lifecycle and so its replacement means that the town will likely be saving energy use at the Library from having this major equipment functioning as intended. In the New Building Institute’s report on Rooftop Unit HVAC Efficiency¹, many of the recommendations for improving energy efficiency in RTUs address issues common in older units. The most frequent issues identified in the report were broken dampers, calibration of the refrigerant system, issues with the control system, and leaks in the equipment. Installing new equipment will likely resolve any untested inefficiencies that may be present.

Project Scope

Purpose

This project addresses one of the top municipal energy users in the portfolio. It encompasses both a necessary and proactive replacement of the Roof Top Equipment, and the implementation of weatherization measures identified in the Energy Reduction Plan. This project will kick start the Town of Burlington’s implementation of the Energy Reduction Plan and will provide a way to spread the word about the town’s new Green Communities designation to residents.

Benefits

The installation of new Roof Top Units at Burlington Public Library will both reduce the electric and thermal energy use for the building and will provide annual cost and

¹ The New Buildings Institute. Rooftop Unit HVAC Efficiency: Repair, Retrofit, Replace A Framework for Energy Savings in Unitary Rooftop Equipment. 2015. http://gettingtozeroforum.org/wp-content/uploads/2015/11/NBI_RTUPrimer.pdf

maintenance savings. Additionally, this project will provide valuable experience for the project team to bring to future Energy Conservation Measures in the implementation of the Energy Reduction Plan.

Timeline

Engineering Study (January - February 2020)

This step has already been completed for the Roof Top Units. More data may be needed to include in the procurement for weatherization measures.

Procurement for Roof Top Units and Weatherization (March - April 2020)

The procurement for this installation is anticipated shortly. The Request for Proposals will include the weatherization work called for in the Energy Reduction Plan, as well as additional weatherization measures needed.

Contracting (May 2020)

We anticipate contracting with the selected vendor to take approximately one month.

Weatherization Installation (July 2020)

The installation of insulation or additional weatherization equipment is planned to occur before the installation of the Roof Top Units.

Installation of New Roof Top Units (September-October 2020)

We have budgeted two months to account for the installation of the Roof Top Units.

Project Outreach (September - December 2020)

We anticipate near-term and ongoing project outreach after installation of the equipment.

Procurement

The town has cost estimates for this project both from the initial Energy Audit of the building and from the Engineering Study from RISE Engineering. This information has been used to estimate the total cost of the project for the purposes of this proposal. However, the town plans to conduct a Request for Proposals (RFP) in order to secure a vendor for the project. The cost estimate may change slightly based on the responses to the RFP and on the selected vendor.

Anticipated Impact

The replacement of the roof top units, weatherization measures, updating of controls, and behavioral measures are anticipated to have many positive impacts on the energy efficiency of Burlington Public Library.

While the anticipated change in energy use as calculated from the audit report itself is not large, the actual energy efficiency outcomes for the library will likely be much higher

due to the age of the equipment being replaced, and to the additional measures being implemented simultaneously at the Library. The town plans to update the building controls in 42 different spaces within the library and anticipates including additional weatherization measures as needed. The town is also investing in staff training to aid in better preventative maintenance and proactive energy monitoring to maximize the efficiency benefits of the system.

Since the equipment being replaced is at the end of its lifecycle, this project will have additional benefits to the efficiency of the building and the health and wellness of building users by virtue of repairing any inefficiencies, leaks, or breaks that may be present.

In addition to the energy impacts of this project. This initial Green Communities project allows an opportunity for the Town of Burlington to conduct outreach about the new Green Communities Designation and what the Energy Reduction Plan will mean for the Town moving forward.

Permits and Approvals

All permits and approvals for this project are within the jurisdiction of the Town of Burlington. Additional permitting fees or timelines are not anticipated for this project.

Outreach and Education Opportunities

The Town will be sending the Lead Foreman of Buildings to HVAC school in FY21. This will save the Town on energy for when we need to troubleshoot any equipment, or a piece of equipment starts to malfunction. Instead of waiting for a company to come assess the problem, we will have a staff member in house who is able to diagnose and fix the problem. The Superintendent of Buildings and the DPW Operations Analyst plan to obtain their Building Operator Certification in the coming fiscal year as well.

Project Budget

The annual estimated cost savings for the project is \$2,729 with a net upfront cost of approximately \$178,970. This estimate is based off the attached RISE energy audit and RTU proposal, and information from Eversource on potential utility incentives. The cost of the project may vary depending on the results of the procurement.

The town anticipates utilizing utility incentives to offset some of the cost of the installation. The town plans to use the total Green Communities Designation Grant amount of \$172,250 towards this project. Capital funds will make up the remaining budget for this project.

Project Economics		Roof Top Units on the Burlington Library
Total Project Cost		\$ 180,970

Estimated Utility Incentives	\$ 2,000
Estimated Net Cost	\$ 178,970
Estimated Annual Cost Savings	\$ 2,500
Estimated Annual Maintenance Savings	\$2,729

In addition to the investment in the Roof Top Unit Replacements themselves, the town plans to implement the weatherization measures identified in the energy audit for the library, additional weatherization measures as needed to ensure that the building is properly weatherized and insulated before the new roof top units are installed, to update building controls in 42 spaces, and to support staff in learning about HVAC maintenance and efficiency. The budget for these project components will be made up of capital funds. The total cost of additional weatherization measures is not known yet.

Project Team

Carlos Pena - RISE Engineering HVAC and Weatherization engineer

- Provided initial study and proposal for replacement RTUs

Frank Anderson - Town of Burlington Superintendent of Buildings and Cemeteries

- Maintains the HVAC systems at all Town buildings. Will work alongside the hired HVAC company to supervise the work being completed. Will coordinate day to day activities.

Nicole Runyan - Town of Burlington Lead Foreman of Buildings and Cemeteries

- Secondary to Frank Anderson and will soon be trained in all things HVAC. Will monitor and maintain the controls in the Library to keep the building running as efficiently as possible.

Rachel Caplan - Town of Burlington Public Works Operations Analyst

- Point of contact for Green Communities and the engineering studies.

Lisa Matarazzo - Town of Burlington Engineering Aide

- In charge of posting the bid opening and collecting bids from all engineering and HVAC companies.

John Sanchez - Town of Burlington Public Works Director

- Will assist Frank Anderson in choosing the right company to complete the job. Makes all final decisions in relation to Public Works projects.

Scott Henriques - Weston & Sampson Senior Project Manager

- Provided initial study and proposal for replacement RTUs

Supporting Materials

The following supporting materials are attached to this application:

Burlington Grant Application Table

This completed Grant Application Table includes the metrics for the RTU replacement proposed for this funding.

Burlington RISE Energy Audit

This energy audit was conducted for the Town of Burlington this past summer and serves as the basis for many of the energy conservation measures included in the energy conservation plan, including the replacements of the RTUs and weatherization measures which are included in this project.

Burlington RISE RTU Proposal

RISE additionally provided the Town of Burlington with a quote and proposal for the replacement of the RTUs for the Library with two new RTUs.

Burlington RTU Daikin Technical Data Sheet

The Town of Burlington sought out an additional opinion on replacement RTUs for the Library roof and is considering going out to bid for this model.

Burlington Certification of Application

This letter certifies that this application is approved to be submitted to DOER.

Contacts

This document was prepared by staff at the Metropolitan Area Planning Council (MAPC) on the behalf of the Town of Burlington. Town of Burlington staff provided all supporting information. Inquiries should be addressed to:

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