

BGS Municipal Energy Resilience Program – Guidance Document- Implementation Program

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1. Program Overview

- a. In accordance with the Vermont Climate Action Plan, buildings comprise 33.9% of total greenhouse gas emissions (GHGs). [Act 172](#), created in partnership by the Executive Branch and the General Assembly, was enacted by Governor Scott on June 2nd, 2022, and expands the State Energy Management Program (SEMP) within the Department of Buildings and General Services (BGS) to assist municipalities in making municipally owned buildings more energy efficient and resilient. Known as the Municipal Energy Resilience Program (herein defined as the “MERP” or “Program”), \$45M was appropriated to make long-term investments to reduce energy use, lower operational costs, and support the State’s climate goals. Qualifying projects include thermal efficiency and supplementing or replacing fossil fuel heating systems with renewable or electric heating systems. Awards will be calculated based on the criteria stipulated in Act 172 as well as the merit of the application. Municipalities with the highest energy burden and lowest resources as defined in [Efficiency Vermont’s 2019 Energy Burden Report](#) will be prioritized for funding.

2. MERP Funding Programs

a. Municipal Energy Resilience Grant Program- Assessments

- i. Part 1 directs the Commissioner of BGS to issue a request for proposal (RFP) for comprehensive energy resilience assessments from the contractor community.
- ii. Part 2 requires the Commissioner of BGS to create a Program in coordination with the Regional Planning Commissions (RPCs) throughout the State for covered municipalities to request and receive an energy resilience

assessment from BGS. These assessments have a variety of requirements as set forth in the bill.

b. Municipal Energy Resilience Grant Program- Implementation

- i. Part 1 outlines a competitive grant Program for the implementation of energy resilience projects in municipally owned buildings. These grants are directed to fund weatherization, thermal efficiency, and to supplement or replace fossil fuel heating systems with more efficient renewable or electric heating systems with a focus on underserved communities in the State. This Program is to be administered by BGS and Efficiency Vermont (EVT).
- ii. Part 2 is the creation of a mini-grant Program that provides funding to all municipalities. Eligible activities include facilitating community meetings and communication about municipal energy resilience and/or hiring services to assist with the planning phase and development of grant applications.

c. Municipal Energy Resilience Grant Program- RPC's

- i. This part of the Act directs BGS to provide grant funding to all RPCs in the State for education and outreach and to provide planning and technical assistance to all municipalities.

2. Funding

1. **Section Overview-** The MERP Program received \$45M in funding from the American Rescue Plan Act (ARPA). This Program was subsequently selected for “Revenue Loss Replacement.” This designation removes many of the restrictions for typical ARPA funding and reporting requirements. It is also treated as state dollars which may be used as match funding for other grant opportunities. Please refer to guidance from the Vermont League of Cities and Towns (VLCT) new [Federal Funding Assistance Program](#) for additional guidance on grant stacking opportunities. **Note: This Program has no match requirement.**
2. **Funding Breakdown**
 - a. **Total Funding: \$45M**
 - b. **RPC Funding: \$2.4M**
 - i. 55% (\$1.08M) of the total to be divided equally among all RPC's.
 - ii. 45% (\$1.32M) of the total to be allocated by the number of municipalities in each RPC coverage area.
 - c. **MERP Funding: \$42.6M**
 - i. \$5M for MERP energy resilience assessments.
 - ii. \$1M for Program administration.
 - iii. \$36.6M for Mini-Grant and Implementation grants.

3. Eligibility

1. Covered Municipality

- a. In accordance with Act 172, ‘covered municipalities’ herein referred to as ‘municipalities’ are eligible for the MERP Program. Municipalities are defined as any city, town, fire district, or incorporated village, except for school districts.

2. Eligible Facilities

a. Municipally Owned Facilities:

- i. **Facilities currently owned by the municipality:** These facilities are eligible for MERP grant opportunities. In instances where a municipality is replacing an existing municipally owned building because of a poor return on investment or the building is no longer viable, they will be considered for an implementation grant on a case-by-case basis to fund specific energy efficiency measures in the new building.
- ii. **Perpetually Leased Facilities:** The program will prioritize buildings that are municipally owned. Perpetual leased facilities by the municipality will be evaluated on a case-by-case basis.

4. Reporting

1. Each Program will have its own reporting requirements required by the State as outlined in Section 8, subsection 5.

5. Special Requirements

1. **Americans with Disabilities Act (ADA)** – In accordance with Act 172, municipalities will be required to attest that the facility receiving an implementation grant is ADA compliant or that the municipality will use up to 20% of the grant amount received towards ADA improvements in the facility. A survey may be needed to determine if a building is ADA compliant. Site surveys can be completed using online resources or by a consultant. At their own expense, municipalities may hire their own consultants or utilize a consultant under retainer contract through the [BGS Office of Purchasing and Contracting](#). **Note: The up to \$4,000 Community Capacity Building Grants may be used towards an ADA assessment.**
2. **High Speed Internet-** Act 172 requires that all municipalities that receive services or funding from the Program attest that the covered municipality has access to high-speed Internet as defined in the State’s Telecommunication Plan set forth in 30 V.S.A. § 202c or that a plan is in place by the end of 2024 to ensure access to high-speed Internet. **Note: Membership in a state recognized Communications Union District (CUD) qualifies the municipality as having met this requirement.**

6. Assistant to Applicants

1. **Section Overview-** As outlined in the funding section of this document, RPCs received funding through Act 172 to provide application and technical assistance, along with Program outreach and education to member municipalities. Municipalities are highly encouraged to coordinate efforts with their respective RPCs. The RPCs are close partners to BGS and will be able to respond to any questions that you may have about the Program. Working with your

RPC's is the easiest and fastest way to meet all your needs. **Note: Municipalities that do not need or want technical support can apply directly to BGS.**

a. **Program Contacts**

i. **Main Points of Contact for the Program**

1. **RPC's**- Almost all questions about the Program should be directed to your local RPC. RPC contacts for MERP are listed on the BGS MERP webpage at <https://bgs.vermont.gov/municipal-energy-resilience-program>.
2. **BGS**- All inquiries to the State should be made to the following email address: BGS.MERP@Vermont.Gov. The website for this Program can be found at: <https://bgs.vermont.gov/municipal-energy-resilience-Program>. This website has information such as Frequently Asked Questions, links to webinars, and additional information. You may also sign up for our server list for notifications about the Program.

ii. **Program Partners**

1. **Regional Planning Commissions (RPCs)** website can be found at: <https://www.vapda.org/regions.html>.
2. **Vermont League of Cities and Towns (VLCT)** and their website can be found at: <https://www.vlct.org/>.
3. **Efficiency Vermont (EVT)** and their website can be found at: <https://www.encyvermont.com/>.
4. **Vermont Energy & Climate Action Network (VECAN)** and their website can be found at: <https://vecan.net/>.

7. Permitting and Code Requirements

1. Projects receiving an implementation grant will be required to obtain all building permits and adhere to building code requirements. BGS has worked with the following State agencies to establish a baseline understanding of MERP and will be able to assist as needed:
 1. **Agency of Commerce and Community Development (ACCD)**- The Vermont Division for Historic Preservation (VDHP), and BGS have developed a streamlined process for review and issuance of any HP preservation project requirements. HP's website can be found at the following address: <https://accd.vermont.gov/historic-preservation>.
 2. **Vermont Department of Public Safety (DPS), Division of Fire Safety (DFS)** – DFS has oversight and enforcement of building construction requirements and permit issuance as well as the oversight and enforcement of ADA requirements in the State. DFS's website can be found at the following address: <https://firesafety.vermont.gov/>.

8. Implementation Program Outline

1. **Overview-** This section pertains solely to the Act 172 implementation grant program.
2. **Key Dates- for communities.**

Implementation Application Opens	08/27/24
Application due	09/27/24
Award notice	11/12/24
Executed Grant Agreements	12/16/24

3. Grant Awards

- a. **Overview-** Implementation Grant: Up to \$500,000 per covered municipality for energy resilience projects related to weatherization, thermal efficiency, supplementing or replacing fossil fuel heating systems with more efficient renewable or electric versions, and any other expenditures necessary for the project to be eligible for funding under federal law and guidelines.
 - i. the improvement or replacement of heating, ventilation, and air conditioning systems. Examples include, but are not limited to:
 1. Installation of new air-to-air heat pump system capable of air conditioning and heating to reduce reliance on existing fossil fuel systems,
 2. Replacement of an old oil boiler with advanced gas system supplemented with air-to-air heat pumps for air conditioning, and
 3. Installation of energy recovery ventilation system.
 - ii. the implementation of conversion to a renewable energy heating system. i.e. biomass pellets, chips, geothermal heat pumps. Examples include, but are not limited to:
 1. Installation of new geothermal heat pump system for building heating and cooling to replace existing propane furnace, and
 2. Replacement of old oil boiler with advanced pellet wood stove.
 - iii. improvements to the thermal envelope i.e. insulation, air sealing, etc. Examples include, but are not limited to:
 1. Air sealing cracks/gaps around doors and windows and attic hatches, and
 2. Addition of blown in cellulose insulation in attic and basement crawl spaces and or wall sections.
 - iv. lighting improvements i.e. fixture replacements/retrofits and controls integration. Examples include, but are not limited to:
 1. Replacement of existing non-Light-emitting diode (LED) lighting with LED bulbs and fixtures, and
 2. Addition of lighting controls systems to existing LED lights.
 - v. resilience measures i.e. solar PV, battery energy storage, and electric vehicle charging stations. Examples include, but are not limited to:

1. Addition of a rooftop or ground mounted solar photovoltaic system to property,
 2. Addition of a power wall battery storage system to provide critical load during power outages, and
 3. Addition of a dual port standalone electric vehicle charging station to parking spaces outside building.
 - vi. Up to 20% of grant for ADA improvements. Examples include, but are not limited to:
 1. Addition of a ramp to access main entrance, and
 2. Addition of an elevator or lift to access second floor.
 - vii. Project support and oversight costs i.e. architecture and engineering services, project management, and construction oversight.
 - b. **Funds**- 20% of the award will be paid at the time the grant agreement is executed. The following payments will consist of the remaining awarded grant amount distributed based on the amount invoiced for actual project costs incurred during the quarter against the original 20% awarded until funds run out, the intent is that the first payment is made within 30 days of the execution of the grant agreement.
 - i. Municipalities can request a financial hardship on a case-by-case basis to fully fund the project upfront if the municipality doesn't have the funds to cover the project in advance of reimbursement.
 - ii. The award amount will depend on the assessment recommendations and their cost estimates, the award maximum, and available funds.
 - c. **Grant Agreement**
 - i. The grant agreement with grantees will be effective until no later than December 31, 2026, or the completion of the improvement project- whichever is sooner.
 1. The grantor/grantee relationship between BGS and covered municipalities may extend beyond this to conform with State-level reporting requirements.
 2. Procurement Policy: Municipalities must follow their own procurement policies. A copy of the policy will be required with a signed grant agreement. If no procurement policies are in place awarded applicants are encouraged to adopt existing [VLCT Procurement Policy for towns](#). See [VLCT MODEL PURCHASING POLICY](#)
- 4. Additional Eligibility Requirements**
- a. **MERP Energy Resilience Assessment** – It is expected that covered municipalities will use the results from their MERP energy resilience assessment to apply for an Implementation Grant.
 - i. The covered municipality will submit a request to implement one or more recommendations in the assessment.
- 5. Reporting Requirements for Implementation Grants**

a. **Quarterly report:**

- i. Municipalities, with the assistance of their RPC, will submit a quarterly report to BGS detailing their expenditures and activities performed no later than 30 days after the close of the quarter. Reports will primarily be quantitative (e.g. funds spent).
 1. BGS will perform random audits on 15% of the projects to ensure compliance. If there are non-compliance issues found, BGS may increase this percentage at their discretion.
 2. BGS will perform a final inspection with the RPCs at project closeout following substantial project completion.
 3. BGS will provide closeout payments with reporting requirements if the project is still open by June 2026.

6. Application

- a. The application for implementation grants is designed to be as easy and accessible as possible. Municipalities are encouraged to consult their RPC for any questions or assistance with completing the application.
- b. Covered municipalities are required to submit an application that includes a narrative section outlining what, why, and how they plan on using the funds and will include a budget worksheet providing a total estimated cost for the project.
- c. In the application form a 10% construction contingency will be required and automatically added to the applicant's total project cost estimate to assist in meeting unexpected cost overruns and will be reflected in the final award determination.
- d. When submitting the application, it is suggested that applicants add 20% to the total project costs to cover what are considered "soft costs". These may be, but are not limited to, architectural and engineering(A&E) design costs, and clerking costs. A total award limit of \$500,000 per applicant still applies. **No applicant will be awarded more than \$500,000.**
- e. The applicant must ensure that they are in compliance with all VDHP regulations. Additional information can be found at [Division for Historic Preservation | Agency of Commerce and Community Development \(vermont.gov\)](https://www.vermont.gov/division-for-historic-preservation)

7. Scoring Metrics – *See Appendix A for more information*

- a. **Applicants will be scored based on the priorities listed in Act 172 Sec. 3(c)(2)(B):**
 - i. Section 1- Highest Energy Burden per Efficiency Vermont's 2019 Energy Burden Report-First Priority- Scoring 5-50
 - ii. Section 2- Municipality that may not have administrative support – Second Priority- Scoring 5-40
 - iii. Section 3- Geographic Location- Third Priority- Scoring 5-30
 - iv. Section 4- Community Size- Fourth Priority- Scoring 3-20
 - v. Section 5- Municipality having already received grant funding- Fifth Priority- Scoring 1-10
 - vi. Section 6 -Energy Conservation and Resilience Measures – Scoring 1-10

APPENDIX A: Scoring Metrics

ACT 172 Scoring Metrics

BGS created the following guidance on scoring grant applications for the MERP. The following is based on the prioritization of key principles from Act 172 §3(c)(2)(B). This document should act as a guide for scoring applications. The scoring metrics will show the highest score equating to highest priority for funding through the grant program. Applicants will have a total possibility of 170 points to be awarded.

Section 1- Energy Burden -10-50

Bill Text: “A Municipality with the highest energy burden community needs and lowest resources, as defined in Efficiency Vermont’s 2019 Energy Burden Report”

Context: EVT’s report calculates energy burden as the percentage of household annual electric, thermal, and transportation spending compared to household annual income.

Source: [Efficiency Vermont’s 2019 Energy Burden Report](#)

Scoring:

Energy Burden	Score
Highest	50
High	40
Moderate	30
Low	20
Lowest	10

Section 2- Municipality that may not have administrative support. – Second Priority- Scoring 5-40

Bill Text: “a municipality that may not have administrative support”

Context: Municipalities which have insufficient administrative and financial support struggle to apply for and obtain grant funding. VCI defines admin support as “Presence of at least one municipal manager or administrator based on a list of Vermont town managers and administrators.” BGS would consider a part time clerk an admin.

Scoring:

Position	Score
All Volunteer support	50
Part Time Town Admin	25
Full Time Town admin/manager	15

Section 3- Geographic Location- Third Priority- Scoring 5-30

Bill Text: “geographic location”

Context: Municipalities that are further from the state’s large municipalities demonstrate a higher need for investment.

Definitions: “large municipality”—Cities and towns in Vermont with a population of over 7,000 people. The cutoff was determined using the Jenks natural breaks optimization method on 2020 Census data used in the VCI.

Scoring: Scoring will be calculated based on driving distance to ‘large municipalities.’ Increments should be equally sized. Actual driving distance is calculated in ArcGIS mapping based on real road miles instead of “as the crow flies” distances to ensure accuracy.

Distance from large municipality	Scoring
50+ miles	30
40 — <50 miles	25
30 — <40 miles	20
20 — <30 miles	15
10 — <20 miles	10
0 — <10 miles	5

Section 4- Community Size- Fourth Priority- Scoring 1-20

Bill Text: “community size”

Context: Larger communities typically have access to more resources and support than smaller communities. This gap reduces smaller communities’ ability to access funding and resources for the needs of their communities.

Community Size	Scoring
0 – 1,500	20
1,501 – 3,300	17
3,301 – 6,000	13
6,001 – 10,000	10
10,001 – 15,000	7
15,001 – 21,000	4
>21,000	1

Section 5- Municipality having already received grant funding- Fifth Priority- Scoring 1-10

Bill Text: “whether another division of the municipality has already received a grant”

Context: The intent is to distribute funds equitably across a variety of municipalities (i.e. limit awards to multiple municipal bodies that lie within the same boundary—e.g. Town A, Village A, and Fire District A).

Scoring: Has the applicant municipality received an energy efficiency grant in the past five (5) years. If yes, then the following applies:

- a. If the applicant is the only municipal body within the political subdivision that has applied, they will receive the total section points (10).
- b. If multiple municipalities have applied for prior energy efficiency grants having been awarded, their applications will be ranked in terms of scope of work and persuasiveness of the narrative section of their application. The highest scoring municipal body will receive the full section points, and each lower ranking municipal body will receive a smaller fraction of the section points.

Section 6- Energy Conservation & Resilience Measures - Sixth Priority- Scoring 1-10

Bill Text: Sec.3 (a)1A&B “...make recommendations to municipalities on the use of more efficient renewable or electric heating systems; and make necessary improvements to reduce emissions by reducing fossil fuel usage and increasing efficiency in municipally owned buildings.”

Context: The intent is to ensure that essential efficiency improvements to lower a building’s energy use intensity (EUI) are considered before resilience measures. Building science indicates that carbon reducing resilience measures, such as heat pumps, solar photovoltaics, and battery storage perform best when installed with envelope improvements. Funding electrification or resilience measures without envelop improvements could render the equipment ineffective in a building with a high EUI and lead to premature mechanical failure.

Scoring: 5 broad categories of energy conservation and resilience measures will be considered, from highest priority for funding to lowest:

1. Building envelope—air sealing and insulation measures. May include but not limited to roofs, attics, crawl spaces, walls, floors, doors and windows.
2. Fuel switching — replacement of a space heating system with a more efficient and/or renewable system; adding air conditioning capability to a building as part of an electric/renewable Heating Ventilation Air Conditioning (HVAC) system, or a standalone energy efficient air conditioner. Electrical service upgrades may be included to accommodate additional load from an electric HVAC system.
3. Lighting and other mechanicals—upgrading existing lighting to LEDs; installing variable frequency drives on an existing HVAC system (if not fuel switching); installing and calibrating building controls systems.
4. Ventilation—installation of an energy recovery ventilator (ERV) or heat recovery ventilator (HRV) and any accompanying ductwork, if non-existent in building, assuming fuel switching is not pursued; replacing air filters with a higher Minimum Efficiency Reporting Value (MERV) version.

5. Resilience Measures—installation of onsite renewable generation including a solar Photo Voltaic (PV) system, battery storage, or electric vehicle supply equipment. Electrical service upgrades may be included to accommodate these projects.

Scope of Work Description	Scoring
Proposed scope of work includes all recommended building envelope improvements, including insulation and air sealing of the building envelope. Window replacement and repair will only be considered a high priority if identified as such in the assessment report (i.e. windows are broken); otherwise, improving air sealing around windows and or, installing storm windows or window inserts will suffice. The other measure categories enumerated above may or may not be included in the scope of work as well.	10
Proposed scope of work does not include any building envelope improvements (whether or not any are recommended in the applicant’s report); but does include fuel switching to a renewable heating and/or cooling source. Upon fuel switching, if the new central HVAC system supplies heat only (i.e., a wood pellet boiler), then a standalone, energy efficient air conditioner(s) may be included in the scope. Electrical service upgrades to accommodate increased load from an electric HVAC system may be included as part of this category. Any lower priority scope categories may be included in the application as well.	8
Proposed scope of work does not include building envelope or fuel switching (whether or not any are recommended in the report); but does include lighting upgrades, mechanical retro-commissioning of the existing HVAC system, and/or building controls. Any lower priority scope categories may be included in the application as well.	6
Proposed scope of work does not include building envelope improvements, fuel switching, or lighting and other mechanical improvements (whether or not any were recommended); but does include installing a standalone Energy Recovery Ventilation/Heat Recovery Ventilation system and any necessary ductwork. This assumes that the applicant does not intend to fuel switch. If the building has an existing air handling unit, air filters may be upgraded to more efficient versions.	4
Proposed scope of work only includes ancillary renewable and resilient energy measures which are not integral to the building’s functionality, including on-site renewable energy generation, battery storage, or electrical vehicle charging stations. Electrical service upgrades may be included as part of these projects, if necessary.	2

APPENDIX B: Assessment Report Guidance

Municipal Energy Resilience Program (MERP) Energy Resilience Assessment Guide

Your report will look slightly different depending on the consultant that completes your assessment, and whether you are receiving a MERP Level 1 or Level 2 assessment; but all the information will be consistent with [2022 Acts and Resolves No. 172](#) (Act 172) §2(d).

Your consultant can answer any questions regarding the report. Please review Act 172 §2(d) to understand exactly what information you can expect from your report.

MERP ENERGY RESILIENCE ASSESSMENT

Certification

MERP CONSULTANT has completed a MERP Energy Resilience Assessment in accordance with the State of Vermont Act 172 at LOCATION. MERP CONSULTANT visited the site on DATE.

The assessment was performed at the Client's request using methods and procedures consistent with MERP Energy Resilience Assessment and using methods and procedures as outlined in MERP CONSULTANT's Proposal.

This report has been prepared for and is exclusively for the use and benefit of the Client identified on the cover page of this report. The purpose for which this report shall be used shall be limited to the use as stated in the contract between the client and MERP CONSULTANT.

This report, or any of the information contained therein, is not for the use or benefit of, nor may it be relied upon by any other person or entity, for any purpose without the advance written consent of MERP CONSULTANT. Any reuse or distribution without such consent shall be at the client's or recipient's sole risk, without liability to MERP CONSULTANT.

Estimated installation costs are based on MERP CONSULTANT's experience on similar projects and industry standard cost estimating tools including *RS Means and Whitestone CostLab*. In developing the installed costs, MERP CONSULTANT also considered the area correction factors for labor rates for Prop C, Prop S. Since actual installed costs may vary widely for particular installation based on labor & material rates at time of installation, MERP CONSULTANT does not guarantee installed cost estimates and shall in no event be liable should actual installed costs vary from the estimated costs herein. We strongly encourage the owner to confirm these cost estimates independently. MERP CONSULTANT does not guarantee the costs savings estimated in this report. MERP CONSULTANT shall in no event be liable should the actual energy savings vary from the savings estimated herein.

MERP CONSULTANT certifies that MERP CONSULTANT has no undisclosed interest in the subject property and that MERP CONSULTANT's employment and compensation are not contingent upon the findings or estimated costs to remedy any deficiencies due to deferred maintenance and any noted component or system replacements.

Prepared by: _____
Project Manager

Reviewed by: _____
Technical Report Reviewer

Municipal Energy Resilience Program (MERP) Energy Resilience Assessment Guide

1. Executive Summary

The purpose of this Energy Assessment is to provide energy efficiency opportunities at the facility and specific recommendations for Energy and Conservation Measures (ECMs). Information obtained from these analyses may be used to support a future application to an Energy Conservation Program, utility grants towards energy conservation, or as a basis for replacement of equipment or systems.

Building Name	Building Type	# Stories	Year Built/ Renovated	Building Size	Estimated Occupancy
		3	1972 / 2005	33,333 SF	

The study included a review of the building's construction features, historical energy and water consumption and costs, review of the building envelope, HVAC equipment, heat distribution systems, lighting, and the building's operational and maintenance practices.

Summary of Existing Energy Performance (Add Utility Data if made available)	
Percentage of Area Cooled	100%
Percentage of Area Heated	100%

1.1. Energy Conservation Measures

MERP CONSULTANT has evaluated X Energy Conservation Measures (ECMs) for this property. The savings for each measure is calculated using standard engineering methods followed in the industry. A **10% discount** in energy savings was applied across measures to account for the interactive effects amongst the ECMs.

MERP CONSULTANT has also applied a 15% contingency to implementation costs to account for potential cost overruns during the implementation of the ECMs.

The following table summarizes the recommended ECMs in terms of description, investment cost, energy consumption reduction, and cost savings. Without utility data, a whole building estimate is not available, therefore best estimates/ modeling available will be given per measure.

Evaluated Energy Conservation Measures: Financial Impact	
Total Projected Initial ECM Investment	\$0
Estimated Annual Cost Savings Related to all ECMs	\$0
Estimated Annual Cost Savings- Electricity	
Estimated Annual Cost Savings- Propane	
Estimated Annual Cost Savings- Natural Gas	
Estimated Annual Cost Savings- Fuel Oil	
Net Effective ECM Payback	X Years
Estimated Annual Energy Savings	X%
Estimated Annual Utility Cost Savings (excluding water)	X%

The executive summary is your go-to reference. It outlines the site visit background, facility overview, methods and calculations, and opportunities to conserve energy and increase resilience. You might find the pros and cons of implementing them and estimates for energy savings and implementation costs here, or in a separate section.

A **10% discount** means that there are interactive effects when implementing multiple energy conservation measures (ECMs) at the same time, resulting in lower energy savings than the sum of their parts. Example: if insulation and air sealing each reduce a heating system's required output by 5 MMBTU (million British Thermal Units, a measurement of fuel energy content), they do not reduce output by 10 MMBTU when done together because they offer overlapping benefits. Each ECM tackles the same problem, heat loss, and the 10% discount avoids double counting savings by estimating the actual reduction as 9 MMBTU.

In summary: Total energy cost savings will be less than the sum of their parts when certain ECMs are done together.

Municipal Energy Resilience Program (MERP) Energy Resilience Assessment Guide

Each ECM has an estimated dollar value for energy and maintenance cost savings. The ECM's installation cost, divided by the annual cost savings, tells you the payback period—the number of years until the savings equal the cost.

The "net effective" payback period tells you **the number of years until the total cost savings from all the ECMs in the report cover their total installation costs.** This number considers any incentives that might be available at the state or federal level to implement these ECMs.

Evaluated Energy Conservation Measures: Financial Impact	
Total Projected Initial ECM Investment	\$0
Estimated Annual Cost Savings Related to all ECMs	\$0
Estimated Annual Cost Savings- Electricity	
Estimated Annual Cost Savings- Propane	
Estimated Annual Cost Savings- Natural Gas	
Estimated Annual Cost Savings- Fuel Oil	
Net Effective ECM Payback	X Years
Estimated Annual Energy Savings	X%
Estimated Annual Utility Cost Savings <i>(excluding water)</i>	X%

ON Site RENEWABLE GENERATION Solar Photovoltaic Analysis	
Estimated number of panels	
Estimated kW Rating (DC)	
Potential Annual kWh Produced	
% of Current Electricity Demand	
Investment Cost	
Estimated Annual Energy Cost Savings	
Payback without Incentives	
Payback with All Incentives	

Municipal Energy Resilience Program (MERP) Energy Resilience Assessment Guide

Evaluated Energy Conservation Measures for TOWN/CITY NAME										
ECM#	Description of ECM	Projected Initial Investment	Estimated Annual Energy Savings					Total Estimated Annual Cost Savings	Simple Payback	
			Natural Gas	Propane	No.2 Oil	Steam	Wood			Electricity
			(Therms)	(Gal)	(Gal)	(MLBs)	(Lbs)			(kWh)
		\$						\$	Years	
Evaluated Measures										
1	ECM NAME Location:	\$						\$		
2	ECM NAME Location:	\$						\$		
3	ECM NAME Location:	\$						\$		
4	ECM NAME Location:	\$						\$		
5	ECM NAME Location:	\$						\$		
6	ECM NAME Location:	\$						\$		
Totals		\$						\$		
Savings Discount Applied 10%		\$						\$		
Total Contingency Expenses 15%		\$						\$		
Total for Improvements		\$						\$		

At the end of the executive summary, a table will summarize the recommendations with cost savings and consumption reductions. Some recommendations may increase the use of a particular energy type, such as installing a heat pump which increases electricity use, but the measure may still reduce energy costs and/or greenhouse gas emissions overall. Any increase in energy use or cost will be shown in parentheses or with a minus sign.

Municipal Energy Resilience Program (MERP) Energy Resilience Assessment Guide

2. Site Utilities

2.1. Utility Rates (Site-specific rates if applicable, otherwise EIA standard rates)

The following utility rates were used for the purposes of savings analysis.

Average (Avg) or Estimated (Est) Utility Rates			
Electricity	Natural Gas	Wood	Propane / No.2 Oil
Avg/Est Rate	Avg/Est Rate	Avg/Est Rate	Avg/Est Rate
\$0.XXX /kWh	\$X.XX/them	\$X.XX/Tons	\$X.XX/Gal

2.2. Site Utility Analysis

Utility Analysis						
UTILITY TYPE	UTILITY PROVIDER	NUMBER OF METERS	ENERGY / WATER USES	ANNUAL CONSUMPTION	ESTIMATED OR ACTUAL CONSUMPTION	ANNUAL COST
Electric			Includes lighting, appliances, plug loads, ventilation, process loads, computers, domestic hot water, heating,	kWh		
Natural Gas				Therms		
Propane		-		Gal		
No. 2 Oil		-		Gal		
Wood		-		Lbs		
Water	Municipality /Well			kGal		
Sewer	Municipality /Septic					

2.3. On-site Utility Storage

Onsite Utility Storage	
Battery Storage	
Storage Capacity	XX kWh
Year Installed	
Location Installed	Roof / Carport / Ground Mounted
Space Served	Entire Building / exterior Lighting
Fossil Fuel Storage	
No.2 Oil // Propane Gas	2X – XXGal Above Ground Tanks
Wood Chips /Pellet	XX Tons- Ext/Int Silo

If you provided utility data, the consultant will use actual rates; otherwise, they will use average utility rates for New England from the Energy Information Administration (EIA).

If you are receiving a Level 2 assessment and provided several years of utility data, you may also see an analysis of monthly or annual energy use trends, energy cost breakdowns by type, or an Energy Star building score (if available).

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This section refers to infrastructure that the building already has, along with the solar photovoltaic (PV) and electric vehicle (EV) charging station recommendations. These recommendations will be included in the executive summary, the facility description, or broken out into a new section.

2.4. On-site Generation

Site Utilities	
Facility Electric Service Size	XX AMPS
Onsite Transformer	Choose an item.
Electric Meter Location	Electrical Room / Exterior Wall Mount

Solar Rooftop Photovoltaic System	
Installed Capacity	XX kW
Year Installed	
Location Installed	Roof / Carport / Ground Mounted
Space Served	Entire Building / exterior Lighting

Emergency Backup Generators	
Generator Capacity	XX kW
Year Installed	
Location Installed	Roof / Carport / Ground Mounted
Space Served	Entire Building / exterior Lighting
Generator Fuel	Choose an item.
Make	

2.5. On-site Electric Vehicle Charging

Onsite Electric Vehicle Charging	
Recommended Charger Quantity	XX
Electrical Charger Type	Level II / Level III
Location for Installation Recommended	YYZZ
Recommendations:	

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3. Introduction

The purpose of this Energy Assessment is to provide the State of Vermont - Building and General Services and Prop N with a baseline of energy usage, the relative energy efficiency of the facility, and specific recommendations for Energy Conservation Measures. Information obtained from these analyses may be used to support a future application to an Energy Conservation Program, Federal and Utility grants towards energy conservation, as well as support performance contracting, justify a municipal bond-funded improvement program, or as a basis for replacement of equipment or systems.

The energy assessment consisted of an onsite visual assessment to determine current conditions, itemize the energy consuming equipment (i.e. Boilers, Make-Up Air Units, DWH equipment), review lighting systems both exterior and interior, and review efficiency of all such equipment. The study also included interviews and consultation with operational and maintenance personnel. The following is a summary of the tasks and reporting that make up the Energy Assessment portion of the report.

The following is a summary of the tasks and reporting that make up the Energy Assessment portion of the report.

Energy and Water Using Equipment

- MERP CONSULTANT has surveyed the tenant spaces, common areas, offices, maintenance facilities and mechanical rooms to document utility-related equipment, including heating systems, cooling systems, air handling systems and lighting systems.

Building Envelope

- MERP CONSULTANT has reviewed the characteristics and conditions of the building envelope, checking insulation values and conditions where accessible. This review also includes an inspection of the condition of walls, windows, doors, roof areas, insulation and special use areas.

Recommendations for Energy Savings Opportunities

- Based on the information gathered during the on-site assessment, the utility rates, as well as recent consumption data and engineering analysis, MERP CONSULTANT has identified opportunities to save energy and provide probable construction costs, projected energy/utility savings and provide a simple payback analysis.

Energy Assessment Process

- Interviewing staff and review plans and past upgrades
- Performing an energy assessment for each use type. Performing a preliminary evaluation of the utility system
- Making preliminary recommendations for system energy improvements and measures
- Estimating initial cost

Reporting

The MERP CONSULTANT Energy Assessment Report includes:

- A comprehensive study identifying all applicable Energy Conservation Measures (ECMs) and priorities, based on initial cost.

Introduction

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This section describes your building’s baseline—the equipment/infrastructure currently in place, condition of the building envelope, etc. This informs the recommendations and their priority level. Replacing a brand-new, high-efficiency oil boiler will not be the highest priority if the building also needs insulation and air sealing.

Recommendations may be included in this section after the existing building component’s status is described. They might be in the executive summary or in a separate section altogether. Your report might also include example proposals, product recommendations, and scopes of work as an appendix—so make sure to read the report in its entirety.

The building envelope consists of exterior walls, windows, roofs, and floors, providing building integrity and separating the exterior from the indoor conditioned space.

For Level 2 assessments, blower door test results are included in this section or as an appendix. The blower door test tells you how ‘leaky’ your building is by measuring the air flow through envelope penetrations in the walls or roof, around windows, etc. The higher the air flow rate, the more poorly insulated the building is—and the higher priority air sealing and insulation will be.

4. Facility Overview and Existing Conditions

4.1. Building Occupancy and Point of Contact

Facility Schedule	
Hours of Operations /Week	
Operational Weeks/Year	
Estimated Facility Occupancy	

Facility Schedule	
Point of Contact Name	
Point of Contact Title	
Point of Contact – Contact Number	

4.2. Building Envelope

Building Foundation	
Item	Description
Foundation	Choose an item.
Basement and Crawl Space	Choose an item.
Basement Wall Insulation	Choose an item.

Roof			
Finish	Choose an item.	Coatings	None
Type / Geometry	Choose an item.	Roof Drains	Choose an item.
Maintenance	Choose an item.	Main Ventilation Source	Choose an item.
Insulation	Choose an item.	Roof / Attic Insulation	R-XX

Exterior Walls	
Type	Location
Primary Finish	Choose an item.

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4.3. Building Heating, Ventilating, and Air-Conditioning (HVAC)

Overall System Description:

Describe the HVAC System here.

System Type (Rooftop Unit, Split System, Central Heating/Cooling)	
Primary Components	Choose an item.
Cooling (if separate from above)	Choose an item.
Age	
Capacity	
Heating Fuel	Choose an item.
Location of Equipment	Choose an item.
Spaces Served by Units	Entire building/Newer wing/Offices/Apartment units/ describe
Manufacturer's Rated Efficiency	XX% output/input or EER or use COP for heat pump system
Refrigerant Used	
Quantity	
Thermostat Control	Central BMS/Local Non-Programmable/Local - Programmable
System Condition	

HVAC Comments:

Describe anything not well-covered by the tables above. Examples: a steam system, a facility utilizing campus-supplied heat or chilled water via local heat exchangers, geothermal, etc.

4.4. Building Lighting

Space Lighting:

(Fixture type/size) light fixtures containing (bulb type/size) bulbs provide interior lighting in the buildings. If The fixtures are currently equipped with magnetic/electronic ballasts. Describe detailed locations of different lighting and fixture types.

Lighting Controls:

The facility does/doesn't have any automatic lighting controls on internal light fixtures. If applicable the lights in the restrooms and individual office spaces are controlled by automatic lighting controls that mainly consist of wall mounted/ceiling mounted occupancy sensors and/or internal photo-sensors.

Emergency Lighting:

The EXIT signs in the facility consist of LED/incandescent lamp/compact fluorescent lamp-based fixtures.

Exterior Lighting:

Property-owned metal light poles provide site lighting, while surface-mounted light fixtures on the exterior walls provide the exterior building with site illumination. Recessed light fixtures are located in the exterior soffits.

The exterior lighting primarily consists of metal halide/high pressure sodium/LED fixtures.

Additional building equipment, such as heating and cooling water circulation pumps, ventilation fans, energy recovery ventilators (ERVs), HVAC controls equipment, etc. will be included here.

Your consultant might complete a lighting inventory with a tool developed by Efficiency Vermont (EVT). The tool tracks the current lighting equipment's energy use and proposes upgrades. The proposal includes an estimate of project costs, including any rebates that EVT offers, and expected energy consumption and cost savings from the project. The tool will only be included if the consultant believes that a lighting project would result in significant savings. For example, the tool may not be included if your building has mostly LED light fixtures, or if any non-LED fixtures are used minimally.

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Certain appliances (e.g. laundry) will not be applicable to some buildings.

Where applicable, your consultant may include recommendations to upgrade to high-efficiency appliances, but such upgrades will not be a top priority for the MERP Implementation Grant.

4.5. Building Appliances & Laundry

Appliances are typically replaced on as-needed basis:

Breakroom Appliances		
Item	Type	Estimated Age & Condition (<i>per sampling</i>)
Refrigerator	Frost-free \ Defrosting Estimated XX% of units are Energy Star 14 \ 15 \ 16 \ 18 cubic feet Freezer location: Side \ Top \ Bottom Manufacturer/s: GE, Kenmore, Electrolux Estimated Annual Consumption: XX KWh	XX% 0 to 5 years (Good) YY% 6 to 10 years (Fair) ZZ% 11 to 20 years (Fair & Poor) AA% 20+ years (Poor)

Laundry Equipment	
Equipment	Comment
Commercial Washing Machines	None // ## machines rated at XXXX LB each
Residential Washers	## leased // property-owned machines (XX top-load and YY front-load)
Residential Dryers	## Gas // Electric leased // property-owned residential dryers

4.6. Building Domestic Water

Domestic Water Distribution & Common Area Fixtures	
Type	Description
Restroom Fixtures	Urinals, toilets, and sinks of commercial grade // residential grade
Common Area Toilet GPF	X.X GPF (<i>Wt. Avg</i>)
Common Area Faucet GPM	Y.Y GPM (<i>Wt. Avg</i>)
Common Area Showerheads GPM	Z.Z GPM (<i>Wt. Avg</i>)

Central Domestic Hot Water	
Components	Choose an item.
Fuel	Choose an item.
Age	
Distribution Pumps	None // XX circulation pumps rated at YY HP each // XX booster pumps rated at YY HP each
Supplementary Storage Tanks	None // XX units at YY gallons each
Domestic Hot Water System Input Capacity	use MBH or BTUH
Manufacturer's Rated Efficiency	XX% output/input
Hot Water Piping	Insulated // Not insulated
Quantity	XX

Plumbing Comments:

Describe anything not well-covered by the tables above—_Examples: a steam system which uses a HEX to provide domestic hot water, geothermal, etc—_

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5. Recommended Operations and Maintenance Plan

The quality of the maintenance and the operation of the facility's energy systems have a direct effect on its overall energy efficiency. Energy-efficiency needs to be a consideration when implementing facility modifications, equipment replacements, and general corrective actions. The following is a list of activities that should be performed as part of the routine maintenance program for the property.



Use the following checklist of low-cost O&M practice to identify opportunities, assign responsibility and track progress toward goals at your facility.

	Opportunity Exists	Target Reduction	Who is Responsible?	Target Date to Complete	Actual Date Completed	Notes
OPERATIONS & MAINTENANCE						
Ensure all equipment is functioning as designed	Y					
Calibrate thermostats	Y					
Adjust dampers	Y					
Implement janitorial best practices	Y					
Properly maintain existing equipment	Y					
Review ENERGY STAR Registry of Labeled Buildings for ideas	Y					
OCCUPANTS' BEHAVIOR						
Turn off equipment	Y					
Institute an energy awareness program	Y					
Adopt a procurement policy for ENERGY STAR qualified equipment	Y					
Maximize use of daylight	Y					
Install task lighting	Y					
Train staff	Y					
LIGHTING						
Change incandescents to CFLs	Y					
Change T12s to T8 or T5	Y					
Install occupancy sensors in back-of-the-house, infrequently used areas						
Install high efficiency LED exit signs						
Periodically clean the bulbs with a dry cloth	Y					
De-lamp where illumination is excessive	Y					
Only use lights that are needed	Y					

www.energystar.gov/benchmark

E-mail: energystarbuildings@epa.gov

This section covers everyday practices that can reduce energy consumption, addressing the use and upkeep of system components to increase their effectiveness and lifespan.

While these measures are not addressed as part of the energy conservation and resilience measures discussed previously, they do have the potential to significantly reduce energy costs.

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6. Appendices

- APPENDIX A: Photographic Record
- APPENDIX B: Site and Floor Plans
- APPENDIX C: Mechanical Inventory
- APPENDIX D: Abbreviated Energy Checklist
- APPENDIX E: Other Supporting Documents

Reports may include photographs in the executive summary and/or facility description sections, including thermal/infrared (IR) imagery

Included if provided by the municipality

A technical documentation of equipment specs such as age, capacity, and remaining useful life