



**GREEN
COMMUNITIES
DESIGNATION
PROGRAM**

Energy Use Baseline

3

Criteria

DOER

Massachusetts Department
of Energy Resources

Supplemental Energy Reduction Plan (SERP) Guidance and Outline

INTRODUCTION

This document is for communities that have previously been designated as a Green Community and want to add municipal or school buildings or other facilities – including from regional school districts (RSD) – to their Energy Reduction Plan (ERP). This document outlines the process for revising the community’s energy use baseline and creating a supplemental energy reduction plan (SERP) that incorporates the added facility(ies) into the original ERP.

Projects for buildings or facilities not included in the municipality’s baseline and therefore not in the municipality’s ERP are considered non-qualified projects, except by accomplishing the twenty percent (20%) percent energy reduction goal, as approved by the DOER. Adding a facility to a community’s baseline and ERP enables the community to direct Green Communities funding to these buildings or facilities through a competitive grant application.

While a SERP can be submitted for approval at any time, the DOER recommends this happen in the months leading up to the Green Communities Annual Report, so that the added facility(ies) are included in it.

If a community adds a new building or facility to its stock and it does not plan to direct Green Communities grant funds to the facility, then a supplemental ERP is not needed. In this case the community should refer to the *Guidance for Reporting Building Stock Changes* in Annual Reports.

❖ **Establishing and Implementing an Energy Reduction Plan**

To meet Criteria 3 for Green Communities Designation, the community will have:

- (1) Established an energy use baseline** and Baseline Year that includes energy use of municipal buildings, school buildings, municipal and school vehicles, street and traffic lighting, drinking water and wastewater treatment plants, pumping stations, and open spaces owned by the municipality.
- (2) Created an Energy Reduction Plan (ERP)** that documents the baseline energy consumption and establishes a comprehensive program designed to reduce this baseline by 20% within the 5-year period following the Baseline Year.

Since designation, the community has:

- (3) Reported annually on the ERP** and assessed progress towards the 20% energy reduction.

❖ **Establish a Supplemental Energy Reduction Plan**

To add building(s) or facility(ies) to the municipal ERP, the community will:

- (1) Establish an updated energy use baseline** that includes the added building(s) or facility(ies) energy use to the original baseline. The SERP will use the same Baseline Year as the ERP. If historic energy use data for the new building(s) or facility(ies) is not available for the community's baseline year the community will work with their Regional Coordinator to determine an appropriate estimation.

For example, a three-year average annual energy use may be used for delivered fuels (propane, oil) while Baseline Year utility-reported energy use is used for electricity and natural gas.

- (2) Create a Supplemental Energy Reduction Plan** that documents the new baseline energy consumption and refreshes the ERP, identifying a pathway to reduce the new baseline by 20% within a given timeframe. The community will work with their Regional Coordinator to determine an appropriate timeframe based on the following guidance:
- a. It is highly preferred that the original 5-year timeframe be maintained, even if much of it has already passed.
 - b. If circumstances dictate that the community cannot meet its 20% energy reduction within the original 5-year timeframe, a new timeframe may be established based on the time needed to implement the ECMs identified in the SERP. This period should be kept to a minimum and may not exceed 5 years.

INSTRUCTIONS FOR CREATING A SUPPLEMENTAL ENERGY REDUCTION PLAN

A comprehensive SERP consists of several key components which enables a municipality to establish NEW energy reduction goals and develop a structure to meet those goals over a specific period. The outline below presents the format for the SERP and addresses its key components. *The information contained in the outline below is the **minimum** information that a municipality is expected to provide in its SERP.* Please use the sample tables provided in this document and in a separate excel file but note that it is imperative to also provide supporting narratives.

SUPPLEMENTAL ENERGY REDUCTION ACTION PLAN OUTLINE

PREAMBLE

Briefly describe why this supplemental plan is needed or desired. Include which facility(ies) are being added and why; the original plan's adoption date and baseline year; whether a new period of completion has been chosen and why, and the timeframe identified to reach the 20% reduction goal.

I. PURPOSE AND ACKNOWLEDGEMENTS

A. Letters from Both General Government and School District Verifying Adoption of the SERP

- **General Government** – The general government must provide a letter from the Chief Executive Officer of the city or town stating that it has adopted the Supplemental Energy Reduction Plan. The Chief Executive Officer is defined as the manager in any city having a manager or in any town having a city form of government, the Mayor in any other city, and the Board of Selectmen in any other town unless some other officer or body is designated to perform the functions of a Chief Executive Officer under the provisions of a local charter or laws having the force of a charter. See sample letter in Appendix A.

- **Public School Districts** – If the facility being added is operated by the local public school district, the district must provide a letter from the Superintendent of Schools stating that it has adopted the Supplemental Energy Reduction Plan. This is not required If the facility being added is not owned or operated by the school district.
- **Regional School Districts** – If the community is seeking to add a facility owned and/or operated by the RSD to their baseline and Supplemental Energy Reduction Plan, the regional school district must also adopt the Supplemental Energy Reduction Plan by providing a letter from the district superintendent stating that it has adopted the plan.

B. List of Contributors that Participated in the Supplemental Baseline and SERP Process

C. Background Information

- List and briefly describe energy conservation measures (ECMs) completed to date following the community’s designation as a Green Community.
- List and briefly describe ECMs proposed for facilities in the original baseline and name the audit or study that recommended each ECM.
- Introduce the audit or study conducted and ECMs proposed to reduce energy use in building(s) or facility(ies) to be added to the baseline.
- Describe availability of historic energy use data for building(s) or facility(ies) to be added to the baseline and whether data are available for the community’s original baseline year.
 - If data are not available for the original baseline year, state how a new baseline year energy use will be established for the expanded pool of baseline facilities.
- If the building(s) or facility(ies) to be added are part of a regional school district, describe how their energy use will be pro-rated for inclusion in the baseline and reported in the Green Communities Annual Report. (See Section III.C. and Appendix B.)

EXECUTIVE SUMMARY

A. Narrative Summary of the Town/City – briefly recap (or copy and paste) the town/city summary from the original ERP adjusted for relevant changes in the community since designation.

B. Narrative Summary of the Regional School District (or other entity) to be added – For RSDs, include member towns (note which ones are also designated Green Communities) and student populations, percent of budget provided by the applying town, governing structure, and list of top executive officials. For other entities, provide similar information. Also provide a brief physical description of the building(s) or facility(ies) to be added to the ERP, their source of energy for space heat and domestic hot water, and history of additions, major alterations and recent significant capital improvements.

C. Updated Summary of Municipal/School Energy Uses – See instructions in *Criteria 3 Energy Reduction Plan (ERP) Guidance and Outline* on how to create Table 1 (sample below). List any heating fuel source changes that have occurred since Green Communities designation (e.g., oil to gas heat or oil to electric heat pump). Reiterating the Table 1 contents in text is not required.

Table 1: Summary of Municipal Energy Users (Sample Data)

	Number	Ownership
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Buildings		
Oil Heat	5	Muni
Oil Heat	3	RSD
Natural Gas Heat	0	
Propane Heat	4	Muni
Biomass Heat	0	
Other Heat Type	0	
Vehicles		
Non-Exempt	25	Muni
Exempt	20	Muni
Exempt	5	RSD
Streetlights	200	Utility (excluded)
Traffic Lights	2	Muni
Water and Sewer		
Drinking Water Treatment Plant	1	Muni
Wastewater Treatment Plant	0	(regional)
Pumping Stations	10	Muni

D. Summary of Energy Use Baseline and Plans for Reductions – use sample Table 2 provided below. Unlike the Table 2 reported in Green Communities Annual Report, in the SERP, break out the added facilities as their own line items and provide a total per category. Communities using MassEnergyInsight (MEI) can find the total MMBtus per category in the “Category View Table” with the *Category level* set to Category; the *Date level* set to Year; the *Metric* set to MMBtu and the *Year* set to the baseline year. To display usage for a newly added facility only, select that facility from the *Search facilities* pull down menu. As has always been the case, Table 2 in Green Communities Annual Reports will only include the totals per category.

Table 2: Sample Summary of Municipal Energy Use Baseline

BASELINE YEAR FY20xx	MMBtu Used in Baseline Year	% of Total MMBtu Baseline Energy Consumption	Projected Planned MMBtu Savings	Savings as % of Total MMBtu Baseline Energy Consumption
Buildings				
Added RSD Building(s)				
Total Buildings				
Vehicles				
Added RSD Vehicle(s)				
Total Vehicles				
Street/Traffic Lights				
Water/Sewer/Pumping				
Open Space¹				
Total		100%		

¹ A municipality can choose to attribute Open Space energy use to the other categories if desired. If open space is used as a category, please be sure to list exactly what is included as a footnote and that, if using MassEnergyInsight, it matches its Table 3.

ENERGY USE BASELINE INVENTORY**A. Identification of the Inventory Tool Used** (preferably MassEnergyInsight)

- B. Reiterate the Baseline Year, define the SERP Timeframe, and explain reasoning for Timeframe.** Example: Our baseline year is FY2017. The timeframe for the 20% energy reduction goal is FY2024-FY2026. This timeframe was selected because the original 5-year timeframe has passed and ECMs needed to achieve the reduction goal have received necessary funding and are expected to be complete by FY2026.

Describe the community's progress to-date in achieving the 20% energy reduction goal and how addition of additional facility(ies) to the baseline will change the baseline energy use and impact achieving the reduction goal.

C. Energy Consumption for the Baseline Year:

Upload into MEI the baseline year energy use for the facility(ies) being added.

If the baseline includes regional school district (RSD) accounts, the energy use data for the RSD should be apportioned in accordance with the funding percentage the municipality contributes to the RSD. Upon request, both the municipality and the RSD should be able to provide the RSD's data prior to apportionment (i.e. the RSD's total energy use).

Refresh the Baseline Year Tables 3a and 3b from the original ERP with the added facility(ies) included. Highlight the facilities being added. These data can be found in the *ERP Guidance Table 3* report in MEI. Provide a narrative describing how baseline year energy use figures were determined for the added facility(ies).

ENERGY REDUCTION PLAN

A. Narrative Summary –

1. *Overview of projects completed in the original baseline facilities.*
2. *(optional) Overview of projects completed in the added facility(ies) since the baseline year. While the community cannot include these ECMs in their 20% energy reduction plan (i.e., in Table 4), the results of this work will show up in their annual energy use reporting (i.e., Table 2) and therefore this is useful background information.*
3. *Overview of short-term goals (years 1-2) including a list of planned and in-process ECMs.*
4. *Overview of mid-term goals (years 3-5) including a list of planned ECMs.*
5. *Identify Areas of Least Efficiency/Greatest Waste – MassEnergyInsight’s “Buildings to Target” view is helpful in identifying these areas. Communities with RSD facilities in their portfolio will need to consult MEI reports for the RSD along with the city/town.*

B. Getting to a 20% Energy Use Reduction within the identified SERP timeframe– NOTE: At a minimum, a municipality must identify specific measures with projected reductions to obtain a 15% reduction with supporting audits and/or calculations for these measures. A general strategy in the narrative section for identifying and obtaining the remaining 5% is acceptable. This section should include energy reductions anticipated from all divisions and departments including: all municipal buildings, school buildings, municipal and school vehicles, street and traffic lighting, drinking water and wastewater treatment plants, pumping stations and open spaces owned by the municipality that were included in the original ERP and that are being added to the baseline in this SERP.

1. *Program Management Plan for Implementation, Monitoring and Oversight* – Identify the personnel responsible both for oversight of the Energy Reduction Plan implementation and for implementation of energy conservation measures in specific departments or buildings, if applicable. Also identify personnel responsible for the Annual Reporting requirements.
2. *Energy Conservation Measures* – In Table 4² (separate Excel file downloaded from [Green Communities website](#)), list completed and planned energy conservation measures, including vehicular efficiency measures. References for each measure must be included in the table and these references, including any calculations, must be included as appendices to the Energy Reduction Plan. Refer to the sample table below, but please submit the excel file in your application.

For each measure, provide:

- its status/projected timeline
- the projected energy savings in native units (kWh, gallons, therms, etc.)
- the projected cost savings
- the total estimated cost
- any utility incentives projected or received (if known)
- any planned use of Green Communities grant funds, if designated
- for measures requiring additional funding, the funding source: capital budget, operating budget, debt and type, or other grants

²Table 4 is also used for future Green Communities reporting, including applying for and final reporting on Green Communities designation grants and for annual reports.

- the source of the calculated energy and cost savings in the reference column; audits and/or calculations must be included in the Appendices.
- For fuel conversions, please include the projected energy savings of the old fuel AND the projected use of the new fuel as a negative energy savings (this will allow calculations of GHG reduction).

Acceptable References for Table 4 - All sources for projected energy savings for individual measures must be identified in Table 4 and supported with documentation. It is acceptable to cite references used in the original ERP unless the reference was supplanted with a more specific or accurate reference. In which case, cite the more accurate reference (e.g., results of a preliminary study should be replaced with contractor proposal with quotes and modeled energy savings if one exists). Identify sources for projected energy savings by ECMs in any facility that is being added.

If any energy audits were completed, including an Investment Grade Audit conducted as part of an energy savings performance contract, please provide the entire audit as an attachment.

(optional) Add ECMs to the ECM list in MEI. - While not required, it is suggested that the municipality maintain a full list of completed, in process, and planned ECMs in MassEnergyInsight to aid the community in tracking work completed and planned over time. To do so, log into MEI, go to *Organize Data*, click on the municipality's name, and select the ECMS tab. Follow the instructions on this page to add or edit ECMs.

If creating an ERP without an audit, municipalities can analyze the energy baseline data for the least efficient buildings to identify appropriate Energy Conservation Measures based upon knowledge of the buildings and their equipment. If sources other than an audit are used for projected energy savings, please summarize those sources here and include complete assumptions and calculations in the Appendices. Note that staff that are Building Operator Certified (BOC) have the credentials to perform these calculations. Alternatively, a municipality may use estimated energy savings from an accredited source, such as DOE or EPA, but must provide the complete assumptions and calculations in the Appendices. Please see the [ERP from the Town of Warwick](#) for an example.

Projected energy savings may be obtained by requesting information from equipment manufacturers. For example, if a building has an older boiler with an efficiency factor of 50% and the proposed new boiler has an efficiency factor of 90%; energy savings from the boiler can be estimated by multiplying 40% times the annual fuel use of the boiler. These calculations must be included in the Appendices.

PLEASE NOTE that the projected energy savings from a building in another municipality's Energy Reduction Plan cannot be used. In addition, the total projected energy savings in an audited municipal building generally cannot be applied to other municipal buildings. To be able to apply projected savings from one audited building to another unaudited building, the buildings must be similar in type and specific measures that are common to both must be identified with supporting details included to verify this type of estimation. Examples include last year of lighting retrofits, current boiler/furnace efficiencies and quotes for new boiler/efficiencies, R-values of insulation and calculations of potential savings. The building types and occupational profiles must be similar unless the measure is building-independent (such as vending machine energy controls).

3. *For Municipalities Using a Performance Contract (Energy Management Services)* – If an Investment Grade Audit (IGA) has been performed, a municipality may provide the IGA report in lieu of Table 4 for those measures and buildings/facilities. If ≥ 15 percent reduction from the baseline energy use has not been identified, additional measures should be listed using Table 4.

C. Summary of Long-Term Energy Reduction Goals – Beyond SERP timeframe

1. *Municipal Buildings (including schools)*
2. *Vehicles (including schools)*
3. *Street and Traffic Lighting*
4. *Perpetuating Energy Efficiency* – Has the municipality considered an energy conservation savings reinvestment plan (in which some of the energy savings are reinvested into a revolving fund to finance future energy efficiency or renewable efficiency measures)? Or has it identified a mechanism for directing some of the energy cost savings from an annual operating budget to reinvesting in further energy efficiency?

MMBtu Conversion Chart³

Fuel Energy Content of Common Fossil Fuels per DOE/EIA

BTU Content of Common Energy Units – (1 million Btu equals 1 MMBtu)

- 1 kilowatt hour of electricity = 0.003412 MMBtu
- 1 therm = 0.1 MMBtu
- 1 ccf (100 cubic foot) of natural gas = 0.1028 MMBtu (based on U.S. consumption, 2007)
- 1 gallon of heating oil = 0.139 MMBtu
- 1 gallon of propane = 0.091 MMBtu
- 1 cord of wood = 20 MMBtu
- 1 ton of wood pellets = 16.5 MMBtu
- 1 gallon of gasoline = 0.124 MMBtu (based on U.S. consumption, 2007)
- 1 gallon of E100 ethanol = 0.084 MMBtu
- 1 gallon of E85 ethanol = 0.095 MMBtu
- 1 gallon of diesel fuel = 0.139 MMBtu
- 1 gallon of B100 biodiesel = 0.129 MMBtu
- 1 gallon of B20 biodiesel = 0.136 MMBtu⁴
- 1 gallon of B10 biodiesel = 0.137 MMBtu⁹
- 1 gallon of B5 biodiesel = 0.138 MMBtu⁹
- 1 barrel of residual fuel oil = 6.287 MMBtu

V. ONSITE RENEWABLE ENERGY PROJECTS & RENEWABLE ENERGY

Please note any plans for onsite municipal renewable energy projects during the identified SERP timeframe. Renewable energy projects cannot be used towards the 20% reduction in any instance. The purchase of Renewable Energy Certificates also cannot be used towards the 20% reduction in any instance. If renewable energy projects are planned, in process or completed, please include them in Table 5 (separate Excel file downloaded from [Green Communities website](#)).

³ If a conversion factor for a fuel you use is not provided, please contact DOER.

⁴ Calculated Values from those of diesel and B100 biodiesel

APPENDIX A – Sample Letters from Both General Government and School District Verifying Adoption of the ERP

General Government – The general government must provide a letter from the Chief Executive Officer of the city or town stating that it has adopted the Supplemental Energy Reduction Plan. The Chief Executive Officer is defined as the manager in any city having a manager or in any town having a city form of government, the Mayor in any other city, and the Board of Selectmen in any other town unless some other officer or body is designated to perform the functions of a Chief Executive Officer under the provisions of a local charter or laws having the force of a charter.

On Town/City Letterhead

September 15, 2022

To Whom It May Concern:

Please be advised that on September 12, 2022, the Select board of the Town met at a duly noticed and regularly scheduled meeting and voted to adopt⁵ the Supplemental Energy Reduction Plan for Criterion 3 of the Green Communities Program. The Select board was given copies of the plan for review prior to the meeting.

The Select board voted unanimously to adopt the plan and the minutes of that meeting include the vote.

Sincerely,

[signature]

Select board Members and/or Chair, Mayor or Town Manager

On School District Letterhead

September 15, 2022

To Whom It May Concern:

Please be advised that the town/city/regional school district adopts the Supplemental Energy Reduction Plan as part of the city/town’s Green Communities Program.

Sincerely,

[signature]

School Superintendent

⁵ The verbs “approve,” “committed,” or “adopt” are acceptable to indicate town/city and school board adoption of the ERP. The verbs “endorse”, or “support” are NOT sufficient indications of town/city and school board adoption of the ERP.

APPENDIX B – Guidance for Inclusion of Regional School Districts in Energy Reduction Plan

Municipalities that are served by regional school districts (RSDs) are encouraged to include facilities owned by RSDs in their energy baselines and reduction plans. This will provide a pathway for Green Community grant funds to be used for clean energy projects at these buildings.

- The energy use data for the RSD should be apportioned in accordance with the funding percentage the municipality contributes to the RSD and included in the municipality’s Energy Reduction Plan as described below. Upon request, both the municipality and the RSD should be able to provide the RSD’s data prior to apportionment (i.e. the RSD’s total energy use).
- A municipality may include its local elementary school that is part of a RSD, but not include its portion of the middle and/or high schools. In this case, 100% of the elementary school’s energy use would be included in the Energy Reduction Plan. The apportionment instructions below do not apply. The accounts from an elementary school belonging to a RSD may be assigned in MassEnergyInsight to an individual municipality if desired.
- The Regional School District must adopt member municipalities Energy Reduction Plans.

Instructions to include RSD Energy Data in a Municipality’s Energy Reduction Plan

- Include a paragraph in the Executive Summary Section **II.B Narrative Summary of the Regional School District** including a description of the RSD and the portion of its funding (as a percentage) that the municipality contributes.
- In **Table 1**, indicate the TOTAL number of buildings, vehicles, streetlights, and traffic lights owned by the RSD, with appropriate subcategories. These numbers should NOT be apportioned to the Municipality based upon the funding assessment percentage. See sample below:

Table 1: Summary of Municipal and RSD Energy Users

	Municipal Number	Ownership
Buildings		
Oil Heat	5	Muni
Oil Heat	3	RSD
Propane Heat	4	Muni
Vehicles		
Non-Exempt	25	Muni
Exempt	20	Muni
Exempt	5	RSD
Streetlights	200	Utility
Traffic Lights	2	Muni

- Include the RSD in the energy usage and projected reduction totals in **Table 2 Summary of Energy Use Baseline and Plans for Reductions**. To calculate the appropriate amount to be included in the usage, multiply the total annual energy use of the RSD by the percentage of funding that the municipality contributes.

Example: Town Y's total annual energy use is 17,000MMBtus. Town Y contributes 40% of the annual RSD funding. Its RSD's total annual energy use is 40,000 MMBtus. The portion of the RSD's energy use attributable to Town Y is $40,000 \times 0.40 = 16,000$ MMBtus. So, Town Y's Total Energy Use, including its RSD portion, is $17,000 + 16,000 = 33,000$ MMBtus.

- For **IIIC *Municipal Energy Consumption for the Baseline Year, Table 3***, please list the RSD as separate building(s) in their own rows and only include the portion attributable to the municipality based upon their funding assessment percentage. For vehicles and street and traffic lights, include as separate rows. For the energy consumption of the RSD's buildings vehicles and lighting, only include the portion attributable to the Municipality based upon their funding assessment percentage.

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Instructions to use MassEnergyInsight for energy use data

- Both the municipality and the RSD must have authorized users, their accounts assigned to specific buildings, and be actively entering oil, propane, and third-party purchased energy data.
- Calculations to assign energy use to the municipality from the RSD cannot be performed in MassEnergyInsight. The data must be exported and independently manipulated. However, as described above, these are simple multiplication and addition functions that can easily be done using a calculator or Excel.
- The accounts from an elementary school belonging to a RSD may be assigned in MassEnergyInsight to an individual municipality if desired.
- These data can be found in MassEnergyInsight's ERP Guidance Tables 3.
- The RSD should provide its energy use data from MEI to the municipality for inclusion in the Green Communities Energy Reduction Plan.
- The municipality should include the RSD data in Tables 1, 2, and 3 as described above.