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Eversource Main St Falls Village, CT – SCOPING STUDY

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Executive Summary

QGM Consulting (Padraic Hagan and Austin Malik) conducted an energy efficiency scoping study at Eversource located at 30 Main Street Falls Village, CT 06031 on Monday March 16, 2026. QGM analyzed the building's electric use and associated Greenhouse Gas emissions. Objectives were to identify and quantify potential Energy Efficiency Measures (EEMs) for energy reduction and operational improvements, as well as estimated Greenhouse Gas reduction potential for any corporate initiatives or targets.

Included in this report is a list of potential EEMs with savings and implementation cost estimates. Please note that the values presented in this report are meant to provide an order of magnitude and are not final values or guarantees for the determination of incentives. A measure summary is provided in the table below.

Eversource Main St Falls Village Service Center - Scoping Study Measure Summary							
EEM#	Energy Efficiency Measure (EEM)	Estimated Annual Cost Savings	Estimated Annual Energy and GHG Savings		Potential GHG Reduction	Estimated Project Cost	Simple Payback
#	Description	$	kWh	GHG (MT CO2e)	% Site GHG	$	years
1	Exterior Lights on Motion Control	$1,000	10,000	2.9	8%	$13,000	13.0
2	Additional Building Shell Remediation	$200	1,600	0.5	1%	$5,000	25.0
TOTAL		$1,200	11,600	3.4	9%	$18,000	15.0
Electrification							
3	Electrification - Replace Electric Heat with ASHPs	$2,000	22,000	6.4	18%	$75,000	37.5
TOTAL ELECTRIFICATION		$2,000	22,000	6.4	18%	$75,000	37.5

These are the measures identified during the initial walkthrough; additional measures may become evident with more time on site. Simple paybacks do not include potential incentives or any non-energy benefits which may include maintenance savings, labor savings, water savings, etc. unless otherwise indicated.

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General Facility Description

The Falls Village site consists of (1) building constructed in 1963 that is used for office space, conference rooms, technician areas, and parts storage/shop. Total building footprint is ~8,000 SF, with recent improvements to windows and doors.

Building heating and cooling are achieved through (1) packaged rooftop unit (RTU) with electric heat, distributed split systems, and hanging electric unit heaters. All heat is electric; there is no fossil fuel use at this site.

Lighting is modern LED with motion controls. Total building occupancy is 6 – 8 people, with normal building hours from ~7:00 AM – 3:30 PM Monday – Friday, and 24 hour occupancy during storm events. Total building operating hours are estimated to be ~3,300.

Monthly Billing Analysis

Electric energy is metered but not billed at this site, with annual use provided. Monthly use was modeled based on annual use, the site's footprint, hours of operation, equipment power density and estimated utilization, and example monthly load profiles from similar sites.

$0.1428/kWh was used as an electric rate based upon Eversource Facilities' third-party electric supply costs for similar type facilities. The most recent 12 months are summarized below:

Most Recent 12 Month Summary							
Energy Usage and Costs	Costs		Energy			MT CO2 Emitted	Unit Costs
	$	% of total	kWh	mmBTU	% of total		
Electric (kWh)	$ 18,244	100%	127,760	436	100%	31.3	$ 0.14
Total	**$ 18,244**	**100%**		**436**	**100%**	**31.3**	

And estimated monthly electric use is shown below:

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Monthly Utility Bill Summary			
Estimated Monthly Electric			
Month	**Electrical Use (kWh)**	**Estimated Cost ($)**	**Estimated Blended Rate ($/kWh)**
Jan-25	15,331	$2,189	$0.14
Feb-25	12,776	$1,824	$0.14
Mar-25	8,943	$1,277	$0.14
Apr-25	6,388	$912	$0.14
May-25	5,110	$730	$0.14
Jun-25	11,498	$1,642	$0.14
Jul-25	14,054	$2,007	$0.14
Aug-25	12,776	$1,824	$0.14
Sep-25	10,221	$1,460	$0.14
Oct-25	5,110	$730	$0.14
Nov-25	11,498	$1,642	$0.14
Dec-25	14,054	$2,007	$0.14
TOTAL	**127,760**	**$18,244**	**$0.14**

The energy use intensity (EUI) shown below is an indicator of building performance in terms of energy use (kbtu) per building square foot:

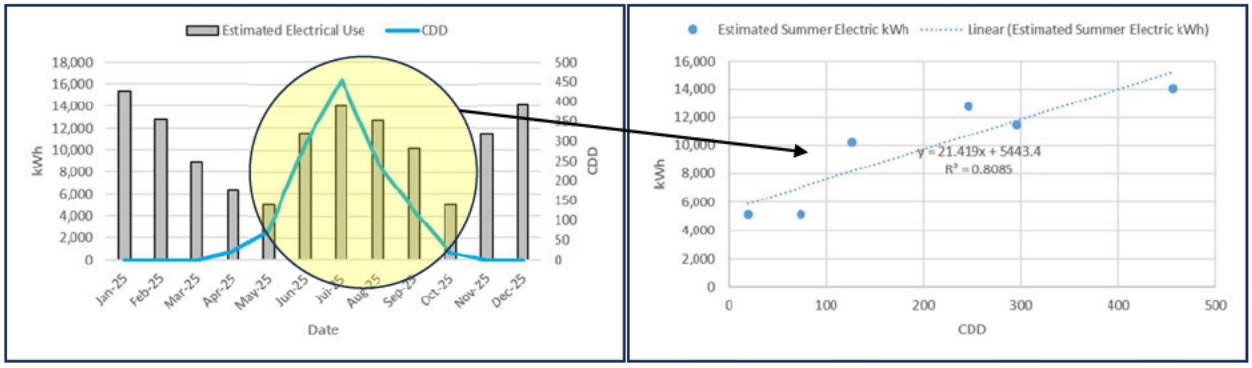
Building Energy Use Intensity (EUI)			
Utility	**Site EUI**	**Source EUI**	**Unit**
Estimated Electricity	48	136	kbtu/sf
TOTAL	**48**	**136**	**kbtu/sf**

Source-site ratio per national average, source:
https://portfoliomanager.energystar.gov/pdf/reference/Source%20Energy.pdf

The EUI metric can be used to baseline existing energy use for future comparison or to compare this building to similar buildings of this type (general office space/fitness center). Energy Star publishes median data by building type for overall comparison.

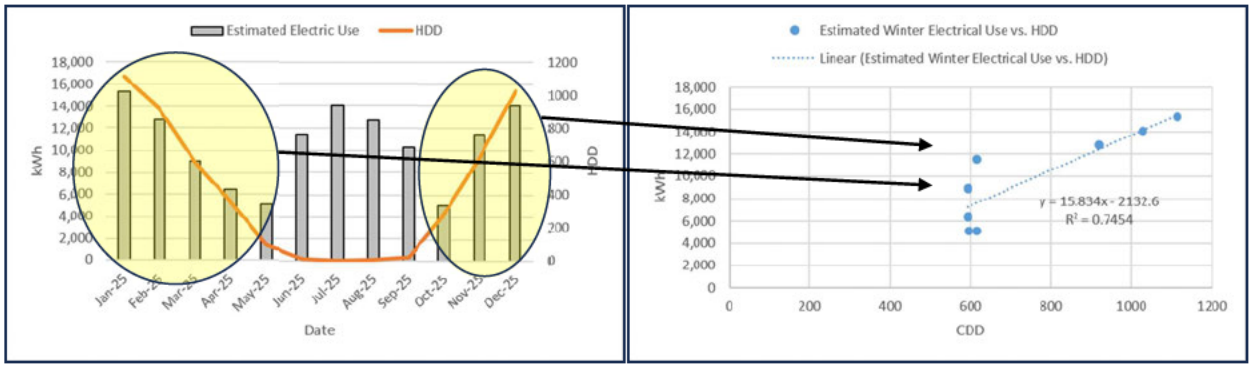
For electrical consumption, weather data for the site along with annual use was utilized to help generate a monthly site profile. Below are graphs for the estimated monthly site electrical use and cooling degree days:

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The regression above analyzes summer cooling/shoulder month use and CDD only and was developed to help model monthly site electrical use. The R^2 regression shows a statistically significant relationship to CDD, with an R^2 value of 0.81 as the site's usage is driven by the outside weather. The Department of Energy Superior Energy Performance (SEP) program qualifies that a strong statistical relationship exists with an R^2 value greater than 0.75.

Similar analysis was carried out for electrical and heating degree days (HDD), as seen below:

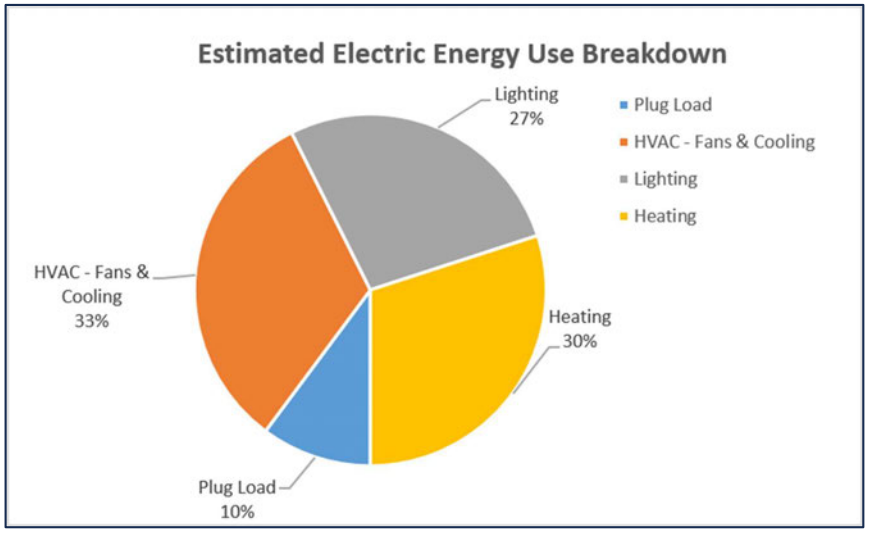


Similar to above, the regression analyzes winter heating/shoulder month use and HDD only and was developed to help model monthly site electrical heating use. The R^2 regression shows a statistically significant relationship to CDD, with an R^2 value of 0.75 as the site's usage is driven by the outside weather. The Department of Energy Superior Energy Performance (SEP) program qualifies that a statistical relationship exists with an R^2 value of 0.75.

Mechanical System Energy Use Breakdown

Modeled Electric Use

The following electric energy use breakdown was developed based on observations and gathered data. These results should be considered high level and were sourced from motor nameplates, typical load factors, and estimated operational hours. Actual data logging is required to confirm these assumptions.



Estimated End Use Breakdown - Electricity	
Electric End Use	**Energy Use (kWh)**
Plug Load	13,000
HVAC - Fans & Cooling	41,432
Lighting	35,000
Heating	38,328
TOTAL	**127,760**

Equipment Inventory:

Site equipment inventories were developed to summarize current equipment, as seen below:

Eversource Falls Village Equipment Inventory								
Type	**Manufacturer**	**Model**	**Serial #**	**Cooling Ton**	**MBH**	**Fan HP**	**CFM**	**Notes**
Roof Top Unit	Trane	THC072E3R0	104010164L	6		0.7	5,900	

Unit Heater Summary	
Description	**Quantity**
Electric Unit Heater	5
Direct Fire Unit Heater	0

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Site Energy Efficiency Measures/Recommendations

EEM – 01 – Consider Exterior Lighting Controls

Exterior Lighting at the facility consists of (10) LED pole lamps illuminating the parking lot and ~5 flood lights mounted to the building exterior. Photos below show some detail:



Example of existing parking lot lights



Building mounted parking lot lighting

The exterior lights are currently controlled by photo-cells and burn during all hours of darkness. It is recommended that the site consider adding motion control to these exterior lights to allow a significant reduction in full power burn hours, while still offering the same safety and security illumination; lights would turn on and illuminate the area if people were detected through motion in the sensor throw area and shut off/ reduce to intensity otherwise.

Options could include (depending on control capabilities):

- Shutoff of all but (1) lamp per fixture
- Output reduction to 30% of all fixtures
- Complete shutdown

Savings assume 4,300 estimated current burn hours and a 65% reduction (conservative) with motion controls:

- **Estimated Annual Energy Savings:** 10,000 kWh
- **Estimated Annual Cost Savings:** $1,000
- **Estimated Implementation Costs:** $13,000

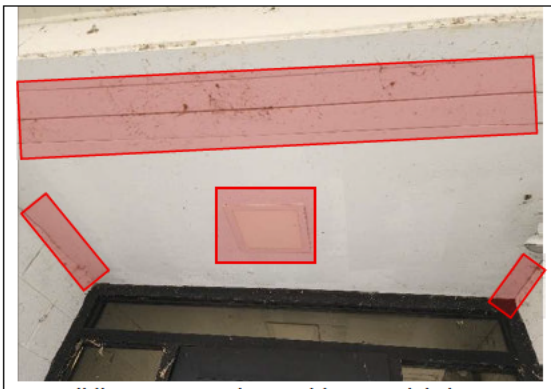
Next Steps:

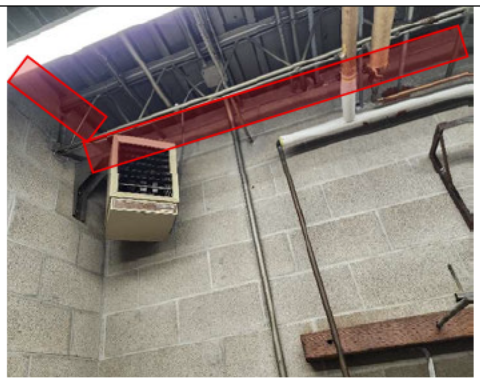
- Site staff are recommended to discuss after-hours lighting requirements to ensure any required minimums are met.
- The site is encouraged to discuss potential control upgrades with a reputable lighting/controls vendor or pursue internally.

EEM – 02 – Additional Building Shell Remediation – Entry Overhang and Roof/Wall Joint Air Sealing

The majority of building shell seals and building planes have been well addressed at this facility. A recent project replaced existing windows, including window seals, and exterior door seals appear new and well-functioning.

Additional areas of potential air infiltration likely exist through the building entry overhang and roof/wall intersections, as seen in the pictures below:


Building entry overhang with potential air gaps


Exposed roof/wall joint with potential air gaps

Often overlooked in building shell assessment and even initial construction, entry overhangs can be poorly sealed along building plane intersections and around exterior lighting, allowing a pathway for untempered air infiltration/exfiltration. Additionally, roof/wall intersections are likely original construction with deteriorated air sealing. It is recommended that site staff assess the air and thermal sealing in the entry overhang and remediate any gaps.

Savings assume a total estimated gap of ~0.1 SF via the ASHRAE Gap and Crack method, and an 80% reduction in air movement through air and thermal sealing:

- **Estimated Annual Energy Savings:** 1,600 kWh
- **Estimated Annual Cost Savings:** $200
- **Estimated Implementation Costs:** $5,000

Next Steps:

- Facility staff are encouraged to work with a local building vendor or internal staff to assess air gaps and remediate.

EEM – 03 – Electrification – Consider Electric Resistance Heating with an Air Source Heat Pump

The facility may want to consider electrification of heating energy usage via replacement of existing rooftop heating equipment with heat pump versions which can heat more efficiently than existing electric resistance units.

Energy and GHG emissions savings would be realized through associated site Greenhouse Gas emissions reduction from reduced energy expenditure noted above, as well as switch to electric heating at a much higher efficiency.

- **Estimated Annual Energy Savings:** **22,000 kWh**
- **Estimated Annual Cost Savings:** **$3,000**
- **Estimated Implementation Costs:** **$75,000**

Next steps:

- Discussion with mechanical vendors and design engineers to determine feasibility, scope of work, and budgetary costs.

Additional Considerations

Solar Generation

Rooftop solar generation was considered for recommendation, offering a net reduction in site electrical use as well as renewable energy "curb appeal" visible from the street, but due to regulatory limitations from historical corporate mergers, Eversource CT sites are not able to have solar arrays on company buildings.

Sustainability Considerations

Background

Site and portfolio sustainability is best guided by the framework and methodology set forth in ASHRAE Standard 228-2023 *Standard Method of Evaluating Zero Net Energy and Zero Net Carbon Building Performance* (available for purchase here: https://www.ashrae.org/technical-resources/bookstore/ansi-ashrae-standard-228-standard-method-of-evaluating-zero-net-energy-and-zero-net-carbon-building-performance). The site is not known to have a present net-zero strategy; however, the ASHRAE standard presents a strong method to:

- Assess current building energy use and carbon emissions
- Establish a baseline
- Develop milestones
- Develop a plan to reach milestones

The data and information shown below are intended to help develop an understanding of where current portfolio sustainability goal aligns with current position.

Emissions Scopes

Emissions reporting is generally addressed across three Emissions Scopes, as seen below:



An important aspect of developing a sustainability plan is the determination of which emissions scopes will be targeted for reduction. The majority of sustainability planning at the time of this report is focused on Scopes 1 and 2, although large corporations with significant supply and delivery chains have begun to address Scope 3 as well. The focus of the sustainability plan in this report is on Scope 1 and 2 emissions.

ASHRAE Standard 228-2023 *Standard Method of Evaluating Zero Net Energy and Zero Net Carbon Building Performance*

ASHRAE 228-2023 includes the following diagram illustrating energy flows into, from, and out of a site:

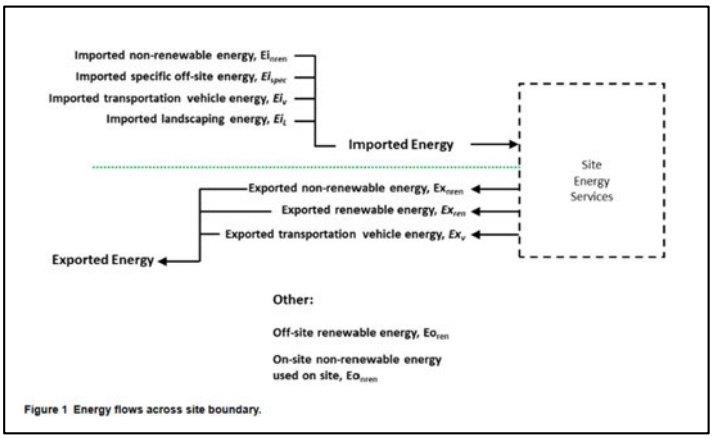


Figure 1 Energy flows across site boundary.

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The difference between energy flow into a site, and energy flow out, is site net energy. The primary goal of sustainability is to reduce this net energy, and therefore, net carbon emissions associated with the site and its operation.

Sustainability Plan

With a carbon baseline established and a goal and timeframe put in place, the next step is to develop a sustainability plan to reduce site net energy and carbon. A four-step plan, as outlined in an article from CBRE (Decarbonizing Commercial Real Estate | CBRE) and shown in the chart below, is recommended:



The table below details the four-step plan with narrative descriptions and progress to date for the target site. Note that the process is by nature to be repeated for continuous improvement and consideration of new technologies:

Eversource Falls Village Service Center Sustainability Plan			
Step	Description	Progress	Notes
1	Efficiency/Conservation	50%	In process, identifying and determining measures
2	Electrify Remaining Loads	0%	Identify and electrify remaining energy loads
3	Renewable Energy Offset	0%	Onsite or purchased renewable electricity
4	Offset Remaining Loads	0%	Purchase RECs on open market, consider portfolio offsets

Step 1: Efficiency and Conservation

Identify possible efficiency and conservation measures at the target site to reduce energy use and associated carbon. This step is in progress at this site – this study has identified several possible measures for the reduction of energy use. These measures should be considered for implementation.

Step 2: Electrify Remaining Loads

Site net energy loads not able to be reduced should be considered for electrification.

Step 3: Renewable Energy Offset

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Offset of site electrical energy use via renewable energy: either generated onsite or through purchasing of renewable energy from sources such as community solar or solar farms as well as energy brokerage.

Step 4: Offset Remaining Loads

Lastly, the site may consider RECs and/or purchased carbon offsets to meet the remaining site net carbon. ASHRAE 228-2023 rigorously defines each of these categories and is strongly recommended as a guideline for these efforts and associated accounting.

Repeat: Steps 1 – 4

A sustainability plan should be viewed as a process of continuous improvement. The site is encouraged to consider additional opportunities and technologies as they become available and more economical.

Next Steps:

- Site to review suggestions in report (and calculation assumptions) and discuss internally if any interest to move forward with any of the recommended opportunities (and work closely with utility on potential offers/process).
- QGM would like to have a virtual report-out to discuss this report. The goal of the meeting is to determine which, if any, of the suggested ECMs are to be acted upon in the near to intermediate future.
- For those ECMs that require input from designers, site is suggested to initiate the process sooner than later. Site is encouraged to get contractors/vendors to site to review and provide budgetary costs.