REDACTED

Eversource Franklin St Torrington, CT – SCOPING STUDY

Utility/Site Contacts

[redacted]
Facilities Supervisor West
Eversource Energy
[redacted]

[redacted]
Head Mechanic
Eversource Energy
[redacted]

Justin Marmaras
Principal
QGM Consulting
860-515-6331
m@qgmconsulting.com

Padraic Hagan
Senior Energy Advisor
QGM Consulting
860-634-6298
phagan@QGMconsulting.com

Austin Malik
Associate Energy Advisor
QGM Consulting
austin.malik@qgmconsulting.com

Executive Summary

QGM Consulting (Padraic Hagan and Austin Malik) conducted an energy efficiency scoping study at the Eversource Service Center located at 174 Franklin Street Torrington, CT 06790 on Monday March 16, 2026. QGM analyzed the buildings' electric and natural gas use as well as associated Greenhouse Gas emissions. Objectives were to identify and quantify potential Energy Efficiency Measures (EEMs) for energy reduction, potential natural gas incentive consideration, and 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 Torrington - 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	CCF	GHG (MT CO2e)	% Site GHG	$	years
1	Building Shell Remediation	$5,000	8,000	2,000	13.3	7.5%	$50,000	10.0
2	Warehouse Air Curtain	$3,000	12,000	1,000	9.0	5.0%	$20,000	6.7
3	Control Conference/Common Area HVAC by Occupancy	$300	700	100	0.8	0.4%	$1,000	3.3
4	Enable VFDs/Disable Bypasses on RTUS	$2,000	12,000		3.5	2.0%	$5,000	2.5
TOTAL		$10,300	32,700	3,100	26.6	15%	$76,000	7.4

These are the measures identified during the assessment 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.

General Facility Description

The Torrington site consists of (4) buildings, with original site construction in 1935:

REDACTED

- Harwinton Ave Building contains workrooms, conference rooms, and offices
- Gas Transmission Center contains warehouse/storage space and work areas
- Garage building used for fleet vehicle maintenance
- Main Building (Franklin Ave) consists of offices, conference rooms, workrooms, and a warehouse

Total facility footprint is ~53,000 SF across all buildings. Typical occupancy is 7:30 AM – 4:00 PM Monday through Friday, with equipment scheduled for occupancy 6:00 AM – 5:00 PM. Additionally, the garage building has a second shift. Total site operating hours are estimated to be ~4,000 annually.

HVAC is provided through a mix of packaged rooftop units (RTUs), electric/hot water unit heaters (UHs), spot use of split systems, and direct-fire natural gas heating. HVAC equipment is controlled with a modern Building Management System (BMS) from Automated Logic, including demand control ventilation (DCV) and adaptive/optimal startup.

Lighting systems are modern LED with integrated controls and were observed to be functioning well.

Building systems such as doors and windows were observed to be aged, with air and moisture infiltration (significant in some areas) taking place.

Monthly Billing Analysis

Historical energy data was received in the form of natural gas bills for (4) accounts/meters on site:

- Eversource natural gas account 5753 552 9077 (174 Franklin St Garage)
- Eversource natural gas account 5772 284 0063 (174 Franklin St)
- Eversource natural gas account 5715 601 0092 (174 Franklin St, additional meter)
- Eversource natural gas account 5717 541 0000 (44 Harwinton Ave)

Bill examples included the past 13 months of natural gas metered use and billed cost, and all accounts were summed for overall site gas use.

Electric use is metered but not billed at this site, with annual use provided; use was modeled based on annual use, the site's footprint, hours of operation, equipment and estimated utilization, and an example monthly load profile from a similar site.

The most recent 12 months are summarized below:

Most Recent 12 Month Summary						
Energy Usage and Costs	Costs	Energy			MT CO2 Emitted	Unit Costs
	$	kWh/CCF	mmBTU	% of total		
Electric (kWh)	$ 51,273	359,056	1,225.1	47%	88.1	$ 0.14
N. Gas (CCF)	$ 23,281	13,427	1,393.7	53%	74.0	$ 1.73
Total	**$ 74,554**		**2,618.8**	**100%**	**162.0**	

QGM CONSULTING

REDACTED

Costs as accounted throughout this analysis have the monthly per-meter "customer charge" (~$60 – $165 depending on the account) removed, for assessment of natural gas marginal cost only. $0.1428/kWh was used as an electric rate based upon Eversource Facilities' third-party electric supply costs for similar type facilities. A summary of modeled monthly electric use and monthly metered natural gas use is shown below:

Monthly Utility Bill Summary							
Estimated Electric				Natural Gas			
Month	Electrical Use (kWh)	Estimated Cost ($)	Estimated Blended Rate ($/kWh)	Month	Natural Gas Use (CCF)	Total Cost ($)	Blended Rate ($/CCF)
Jan-25	19,690	$2,812	$0.14	Jan-25	2,641	$4,579	$1.73
Feb-25	24,158	$3,450	$0.14	Feb-25	2,468	$4,279	$1.73
Mar-25	25,481	$3,639	$0.14	Mar-25	1,509	$2,616	$1.73
Apr-25	28,294	$4,040	$0.14	Apr-25	1,008	$1,748	$1.73
May-25	30,114	$4,300	$0.14	May-25	377	$654	$1.73
Jun-25	37,726	$5,387	$0.14	Jun-25	121	$210	$1.73
Jul-25	38,222	$5,458	$0.14	Jul-25	188	$326	$1.73
Aug-25	40,704	$5,813	$0.14	Aug-25	57	$99	$1.73
Sep-25	37,726	$5,387	$0.14	Sep-25	102	$177	$1.73
Oct-25	31,438	$4,489	$0.14	Oct-25	731	$1,267	$1.73
Nov-25	23,661	$3,379	$0.14	Nov-25	1,592	$2,760	$1.73
Dec-25	21,841	$3,119	$0.14	Dec-25	2,633	$4,565	$1.73
TOTAL	**359,056**	**$51,273**	**$0.14**	**TOTAL**	**13,427**	**$23,281**	$1.73

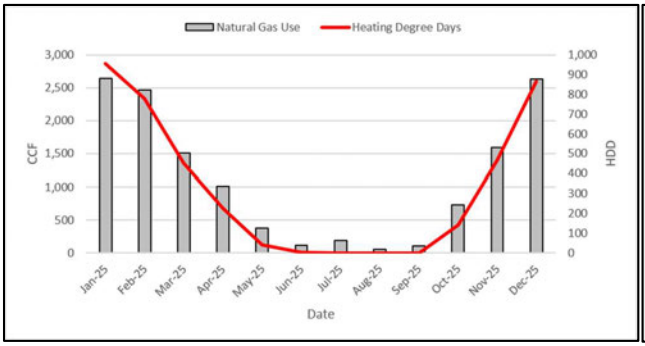
The energy use intensity (EUI) shown below is an indicator of building performance in terms of energy use (kbtu) per building square foot:

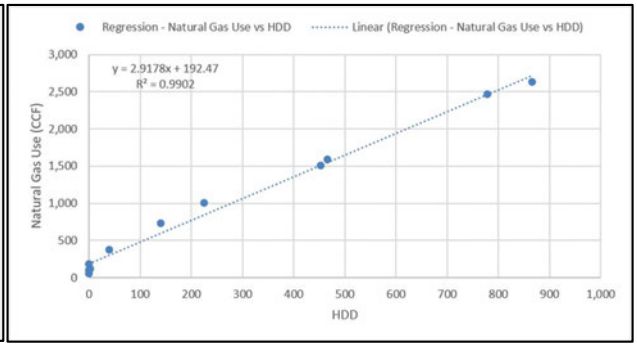
Building Energy Use Intensity (EUI)			
Utility	Site EUI	Source EUI	Unit
Natural Gas	26	27	kbtu/sf
Estimated Electricity	24	66	kbtu/sf
TOTAL	**50**	**93**	**kbtu/sf**

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. Energy Star publishes median data by building type for overall comparison.

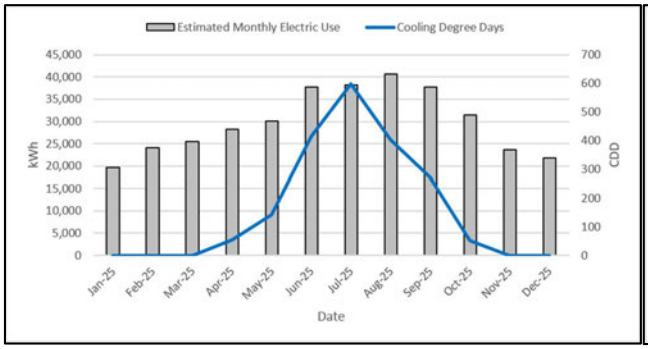
Additionally, data was analyzed to understand the impact of weather on the site and natural gas use (actual metered use) and heating degree days (HDD), as seen below:

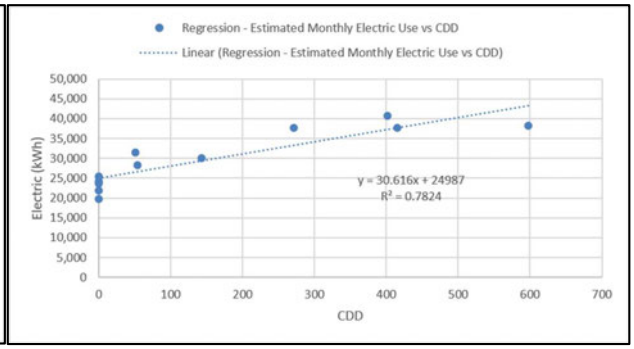




The first graph indicates a visual relationship between natural gas use and HDD, suggesting a majority of the natural gas is used for building heating. Summer month natural gas use can likely be attributed to service hot water. The regression further shows that site natural gas use has a strong, statistically significant relationship to HDD, with an R^2 value of 0.99.

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





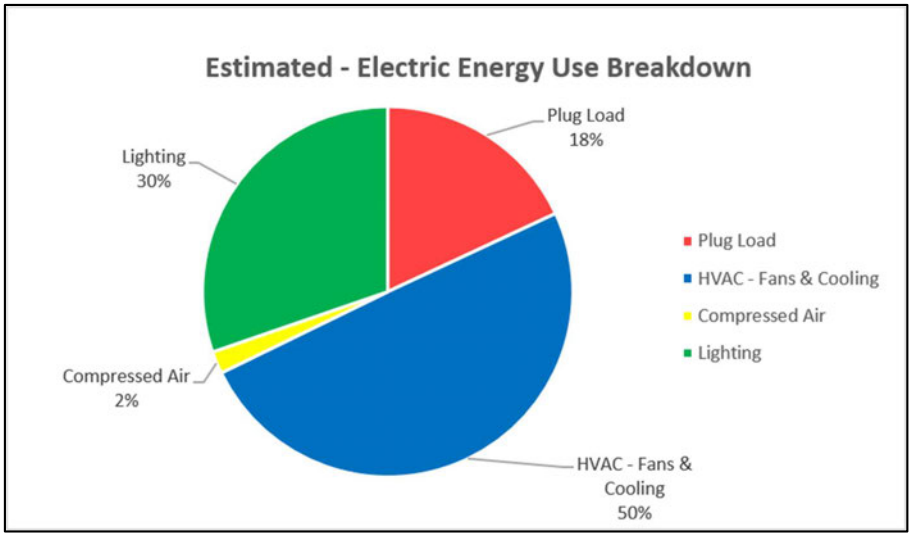
The regression above was developed to help model site monthly electrical use. The R^2 regression shows a statistically significant relationship to CDD, with an R^2 value of 0.78 as the site's usage is driven by the outside weather. The Department of Energy Superior Energy Performance (SEP) program qualifies that a statistical relationship exists with an R^2 value of 0.75, indicating a strong model fit.

Mechanical System Energy Use Breakdown

Electric Use

The following electric energy use breakdown was developed based on data gathered during the assessment. 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.

REDACTED

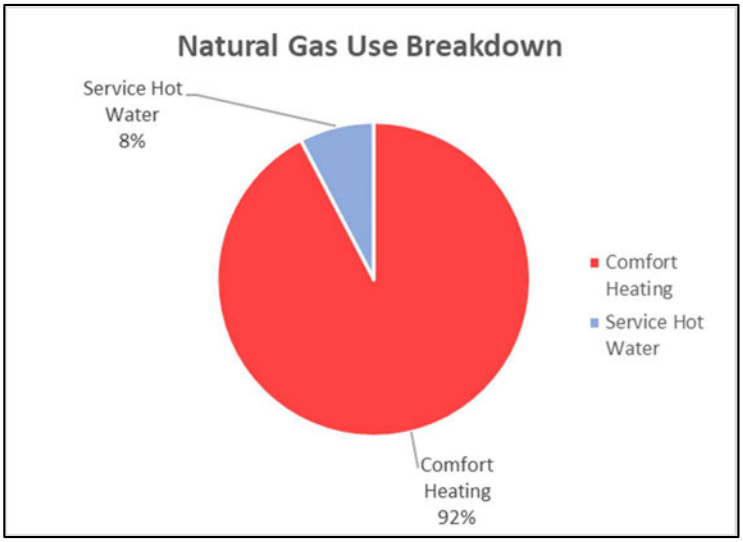


Estimated End Use Breakdown - Electricity	
Electric End Use	**Energy Use (kWh)**
Plug Load	65,000
HVAC - Fans & Cooling	179,000
Compressed Air	7,000
Lighting	109,000
TOTAL	**360,000**

Natural Gas Use

Additionally, the following site natural gas use breakdown was developed. As above, these results should be considered high level and were sourced from equipment nameplates, typical load factors, and estimated operational hours. Actual data logging is required to confirm these assumptions.

REDACTED



Estimated End Use Breakdown - Natural Gas	
Natural Gas End Use	**Energy Use (CCF)**
Comfort Heating	12,000
Service Hot Water	1,000
TOTAL	**13,000**

Lighting Equipment

The entire site was retrofitted with LED lighting that appears to be in good working order.

Equipment Inventory:

Site equipment inventories were created to annotate equipment data gathered during the assessment, as seen below:

Compressed Air:

Eversource Torrington Compressor Inventory							
Make	Model	HP	Capacity (CFM)	Compressor Control Type	Cooling	Voltage	Estimated Annual Run Hours
Curtis	CT10	10	30	Recip	Air Cooled	460	1,000
**Annual run hours estimated*							

REDACTED

Eversource Torrington Dryer Inventory			
Make	Model	Rated CFM	Type
Hankison	SPX	35	Non-Cycling Refrigerated

Pumps:

Well Pump Summary	
Quantity	Horsepower
2	1/6

HVAC:

Eversource Torrington HVAC Equipment Inventory									
Tag	Type	Manufacturer	Model	Serial #	Cooling Ton	MBH	Fan HP	CFM	Notes
RTU-1	Packaged Roof Top Unit	AAON	RN-013-8-O-HAOA-3G4	202311-ANGK112368	13		3		Serves 44 Harwington Ave
	Air Handling Unit								
LPL2 #4	Exhaust Fan	Cook	100C17DEC 100 ACEH	140PK69655			0.25	450	
	Split System - Condenser	American Standard	4A7A7048B	213545T35F	4		4.6		
	Packaged Roof Top Unit	Trane	YHC102F4RHA27C9	213614331L	8.5	160	2.75	6,800	Serves Substation
	Exhaust Fan	Cook	7C10WTW10	2805615			0.03		
	Split System - Condenser	Mitsubishi	MXZ-3C24NAHZ2	8ZPQ4985			0.12		Serves Garage
	Split System - Wall Unit	Mitsubishi	MSZ-GL12NA	93E37324			0.04		
	Split System - Wall Unit	Mitsubishi	MSZ-GL12NA	93E36898			0.04		
	Natural Gas Makeup Air Unit	RUPPAIR	RAM-M 12	4852304		227	2	2,800	
	Exhaust Fan	Greenheck	G-123-V65X-CD	17013708					
	Exhaust Fan	Greenheck	G-130-B-6-1-19	18786601			0.17	248	
EF 9 - D.D	Exhaust Fan	Dayton	6KWK5	15967390			0.25	864	Serve Main building
EF 16	Exhaust Fan	Jenn Air	142 BCR						
RTU2	Packaged Roof Top Unit	Lennox	KGB074S4TU2G	5622H10029	6	86	2		
EF 6 - Warehouse	Exhaust Fan	Jenn Air	3 02 BCRE						
EF 5 - Warehouse	Exhaust Fan	Jenn Air	3 02 BCRE						
	Packaged Roof Top Unit	Trane	YHC036E1EM	182515373L	3	80	0.75	3,064	
	Exhaust Fan	Greenheck	-	17004284					
	Packaged Roof Top Unit	Trane	YHC060F4RLA1TD	202710426L	5	48	1	3,953	
EF 11- Locker Roo	Exhaust Fan	Jenn Air	182 BCRA						
EF 12	Exhaust Fan	Jenn Air	101CRAFL						
	Packaged Roof Top Unit	Trane	YHC092F4RHA	203010143L	7.5	160	2.75	6,800	
	Packaged Roof Top Unit	Trane	YHC092F4RHA	220410172L	7.5	160	2.75	6,800	

Best Practices

The Torrington Service Center facility was observed during the assessment walkthrough to be following several energy Best Practices:

- Use of LED lighting in most/all areas with aggressive controls
- Scheduled nighttime/weekend temperature setback in most/all areas
- Demand Control Ventilation and Adaptive/Optimal Startup HVAC control strategies in place
- Garage exhaust fans controlled by VFD and interlocked with MAUs

REDACTED

Site Energy Efficiency Measures/Recommendations

EEM – 01 – Consider Building Shell Gap Remediation

During the walk through of the site, gaps and cracks were noted at door and window seals as well as the roof/wall intersections along the building perimeter. Insulation and air sealing are understood to be original construction and have likely degraded significantly. Envelope gaps are thus allowing the infiltration/exfiltration of untempered air as well as significant moisture (see window photo below). Infiltration of untempered air increases the load on HVAC equipment, while moisture infiltration can damage building systems and further increase air seal degradation, exacerbating an existing issue.

It is recommended that the site perform a comprehensive building and thermal shell survey and remediate any identified gaps, including replacement of window systems and air seals. Pictures below detail some of the observed building shell gaps:



Exterior window along Harwinton Ave with significant water infiltration. Where water can infiltrate, air can as well, and the moisture degrades any remaining seal.



Exterior double door with visible daylight along floor

Savings were estimated assuming improvements in thermal envelope as well as a reduction in outdoor air infiltration during both heating and cooling seasons:

- **Estimated Annual Energy Savings:** 8,000 kWh and 2,000 CCF
- **Estimated Annual Cost Savings:** $5,000
- **Estimated Implementation Costs:** $50,000 including survey costs/excluding window glazing

Next Steps:

- The site is encouraged to discuss building shell survey and remediation with a specialized vendor.
- The site should also discuss this effort with a utility representative for possible incentives to offset some of the survey and implementation costs through the custom program.

EEM – 02 – Consider Installing an Air Curtain for Loading Dock Door

A loading dock door in the warehouse area was noted to be constantly open for frequent loading/offloading of meter materials for transportation. Below is a photo of the door:



With this door open most/all hours of the day, significant conditioned air is lost to the outdoors. It is recommended that facility staff consider installing an air curtain on the loading dock door (as has been installed in another similar area at the site.

The air curtain would act as a barrier between the outside air and inside conditioned air (for a small fan penalty), reducing conditioned air leaving the space but maintaining ease of access for forklift travel.

Savings are estimated assuming average airflow through the open doorway and a (conservative) 50% reduction factor from the installation of an air curtain. Additionally, air curtain fan capacity is estimated at 0.5hp for all operating hours.

- **Estimated Annual Energy Savings:** 12,000 kWh and 1,000 CCF
- **Estimated Annual Cost Savings:** $3,000
- **Estimated Implementation Costs:** $20,000

Next Steps:

- The site is encouraged to discuss potential control upgrades with a reputable local vendor or pursue internally.
- Facility staff may wish to enquire with natural gas utility representatives to determine if this kind of air barrier would qualify for incentives to offset some of the installation costs.

REDACTED

EEM – 03 – Control Variable Use Spaces Heating and Cooling via Occupancy

An innovative control strategy noted in use at other Eversource sites is the control of auditorium and conference room HVAC equipment based on an occupancy schedule. These spaces see highly variable occupancy, particularly post-COVID. Setting these large and intermittently occupied spaces to unoccupied setpoints for significant periods of non-use (much as many sites do with lighting) reduces the associated energy expenditure, while still allowing a quick recovery for occupancy.

Multiple areas such as conference rooms at the Torrington Service Center were noted that could benefit from this strategy. The example below summarizes a potential before and after schedule – assuming average consistent use in the 10 AM – 2 PM period of weekdays:

HVAC Schedule - Existing and Proposed with Occupancy Control

Existing Schedule

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
12:00 AM							
1:00 AM							
2:00 AM							
3:00 AM							
4:00 AM							
5:00 AM		X	X	X	X	X	
6:00 AM		X	X	X	X	X	
7:00 AM		X	X	X	X	X	
8:00 AM		X	X	X	X	X	
9:00 AM		X	X	X	X	X	
10:00 AM		X	X	X	X	X	
11:00 AM		X	X	X	X	X	
12:00 PM		X	X	X	X	X	
1:00 PM		X	X	X	X	X	
2:00 PM		X	X	X	X	X	
3:00 PM		X	X	X	X	X	
4:00 PM		X	X	X	X	X	
5:00 PM		X	X	X	X	X	
6:00 PM		X	X	X	X	X	
7:00 PM							
8:00 PM							
9:00 PM							
10:00 PM							
11:00 PM							
Occ Hrs	0	14	14	14	14	14	0
UnOcc Hrs	24	10	10	10	10	10	24

Proposed Schedule - Estimated Reduced Hours

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
12:00 AM							
1:00 AM							
2:00 AM							
3:00 AM							
4:00 AM							
5:00 AM							
6:00 AM							
7:00 AM							
8:00 AM							
9:00 AM							
10:00 AM		X	X	X	X	X	
11:00 AM		X	X	X	X	X	
12:00 PM		X	X	X	X	X	
1:00 PM		X	X	X	X	X	
2:00 PM		X	X	X	X	X	
3:00 PM							
4:00 PM							
5:00 PM							
6:00 PM							
7:00 PM							
8:00 PM							
9:00 PM							
10:00 PM							
11:00 PM							
Occ Hrs	0	5	5	5	5	5	0
UnOcc Hrs	24	19	19	19	19	19	24

Implementation of this strategy may be possible via programming within the existing controls or require the installation of new thermostats or local controls and occupancy sensors. The table below shows estimated costs and savings from the implementation of this type of control. Note that the AHU serving this space utilizes electric heat.

- **Estimated Annual Energy Savings: 700 kWh and 100 CCF**
- **Estimated Annual Cost Savings: $300**
- **Estimated Implementation Costs: $1,000**

Next Steps:

- Review of BMS is recommended to confirm equipment loading assumptions and schedules.
- The site is encouraged to discuss potential control upgrades with an ALC representative or internal resources.

QGM CONSULTING

REDACTED

EEM – 04 – Remove Bypasses and Enable Fan VFDs on Trane RTUs

Discussion with site staff indicates that (3) total RTUs have factory fan VFDs that are not currently in use, with the units relying on bypass ducting to modulate supply air temperature to spaces to meet demand. RTUs include (2) Trane units serving the Main Building, and (1) Trane unit serving the Substation Maintenance building.

The spaces under consideration are already served by variable air volume (VAV) boxes, thus conditioned air could be provided by an RTU modulating fan speed to maintain a static pressure setpoint, reducing fan energy required to maintain space setpoints.

It is recommended that the facility consider removing any bypass ducting and associated controls and enable the existing RTU VFDs.

Savings assume an average 45% reduction in supply fan energy for each RTU across its annual operation:

- **Estimated Annual Energy Savings:** **12,000 kWh**
- **Estimated Annual Cost Savings:** **$2,000**
- **Estimated Implementation Costs:** **$5,000**

Next Steps:

- Site should review equipment modifications with a mechanical vendor or internal staff.

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:

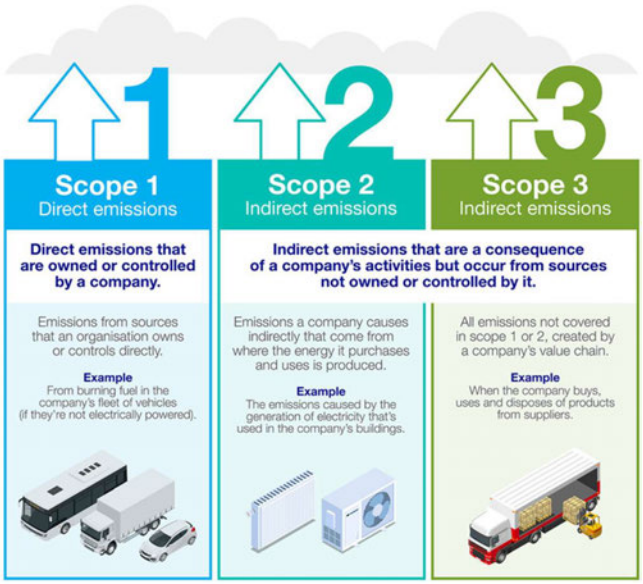
- Assess current building energy use and carbon emissions
- Establish a baseline
- Develop milestones
- Develop a plan to reach milestones

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:

REDACTED



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:

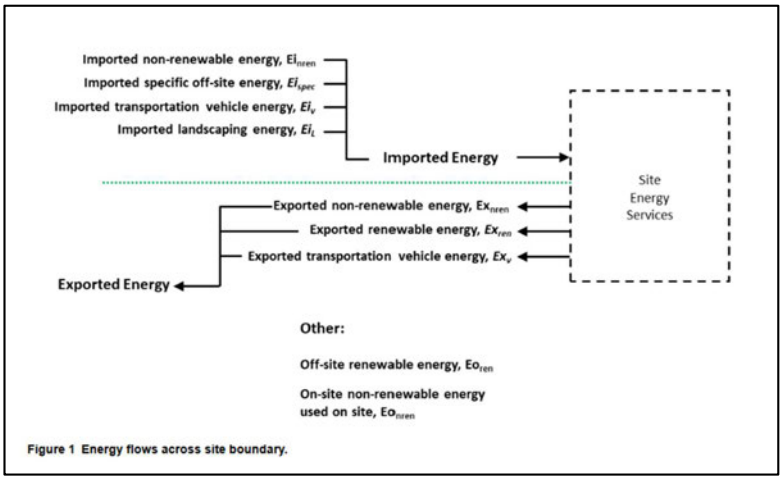


Figure 1 Energy flows across site boundary.

REDACTED

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:

ESCT Torrington 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

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).
- Most attractive measures in terms of energy savings, operational efficiencies, and potential utility incentives include:
    - Building shell remediation
    - BMS controls opportunities
- 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.