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Eversource Tindall Ave Norwalk, CT Service Center – SCOPING STUDY

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Executive Summary

QGM Consulting (Padraic Hagan) conducted an energy efficiency scoping study at Eversource located at 9 Tindall Ave, Norwalk, CT 06851 on Thursday March 12, 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 and operating cost reductions 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 Tindall Ave Norwalk - 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	$1,000	4,500	750	5.4	2%	$20,000	20.0
2	New Chilled Water & Hot Water Pumps	$600	4,000		1.2	1%	$27,000	45.0
TOTAL		$1,600	8,500	750	6.6	3%	$47,000	29.4
Electrification Measures								
3	Electrification - Natural Gas/HW UHs to Splits	$0	(41,000)	5,000	15.6	7%	$75,000	n/a

These are the measures identified during the study walk through; additional measures could 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

Original construction of the building is dated to 1930. The main building has had recent renovations, including window replacements (3 of 4 sides of the building complete as of the date of this report) and door evaluation/replacement. Heating, ventilation, and air conditioning is provided by:

- (1) packaged rooftop unit (RTU
- (2) direct fire natural gas Makeup Air Units (MAUs) (3)
- hanging hot water/chilled water (HW/CHW) Air Handling Units (AHUs)
- (16) HW/CHW Fan Coil Units (FCUs) in office perimeter areas
- (5) HW and (2) electric unit heaters (UHs)
- (3) Mitsubishi split systems for spot cooling

Hot water is provided by (2) boiler plants:

- (2) Fulton electric boilers (capacity unclear, rarely used)
- (2) 199 MBH Munchkin 199M R2 natural gas hot water boilers

Chilled water is provided by (1) Trane CGAM040A2Q02 40-ton air cooled chiller. HW and CHW pumping is achieved through a constant volume duplex 1.5hp 2-pipe pumping system with seasonal changeover.

Lighting systems are LED with motion/occupancy controls. Lighting controls are reported to be commissioned and functioning well.

The maintenance garage/shop area is heated with direct-fire natural gas UHs and natural gas fired radiant heaters. Process equipment in the garage area includes (1) 10hp Hertz HBD7 high pressure air compressor, serving the pneumatic lifts and shop tools (regulated down to low pressure for tools).

Typical building occupancy is 6:00 AM – 5:30 PM, Monday through Friday with limited to no weekend hours. 24-hour occupancy occurs during emergency and storm events. Occupied building operations are estimated to be 3,400 annual hours.

Monthly Billing Analysis

Historical energy data was received in the form of natural gas bills for (2) accounts/meters on site, both listed as 9 Tindall Ave Norwalk, CT:

- Eversource natural gas account 5713 584 0015
- Eversource natural gas account 5772 893 0041

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.

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The most recent 12 months are summarized below:

Most Recent 12 Month Summary						
Energy Usage and Costs	Costs	Energy			MT CO2	Unit
	$	kWh/CCF	mmBTU	% of total	Emitted	Costs
Electric (kWh)	$ 61,454	430,349	1,468.4	51%	105.5	$ 0.14
N. Gas (CCF)	$ 22,240	13,715	1,423.6	49%	75.6	$ 1.62
Total	**$ 83,694**		**2,892.0**	**100%**	**181.1**	

Natural gas costs as accounted throughout this analysis have the monthly per-meter "customer charge" (~$60 – $102 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 metered monthly natural gas use is shown below:

Monthly Utility Bill Summary							
Estimated Monthly 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	25,821	$ 3,687	$ 0.14	Jan-25	4,318	$ 7,002	$ 1.62
Feb-25	25,821	$ 3,687	$ 0.14	Feb-25	3,023	$ 4,902	$ 1.62
Mar-25	30,124	$ 4,302	$ 0.14	Mar-25	2,520	$ 4,086	$ 1.62
Apr-25	33,298	$ 4,755	$ 0.14	Apr-25	1,426	$ 2,312	$ 1.62
May-25	38,731	$ 5,531	$ 0.14	May-25	966	$ 1,566	$ 1.62
Jun-25	44,398	$ 6,340	$ 0.14	Jun-25	295	$ 478	$ 1.62
Jul-25	49,296	$ 7,040	$ 0.14	Jul-25	16	$ 26	$ 1.62
Aug-25	49,275	$ 7,036	$ 0.14	Aug-25	71	$ 115	$ 1.62
Sep-25	43,035	$ 6,145	$ 0.14	Sep-25	85	$ 138	$ 1.62
Oct-25	36,998	$ 5,283	$ 0.14	Oct-25	710	$ 1,151	$ 1.62
Nov-25	27,846	$ 3,976	$ 0.14	Nov-25	1,724	$ 2,796	$ 1.62
Dec-25	25,704	$ 3,671	$ 0.14	Dec-25	2,879	$ 4,669	$ 1.62
TOTAL	**430,349**	**$ 61,454**	**$ 0.14**	**TOTAL**	**18,033**	**$ 29,243**	$ 1.62

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

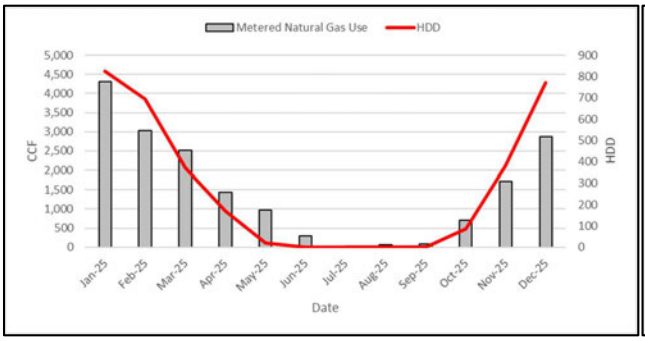
Building Energy Use Intensity (EUI)			
Utility	Site EUI	Source EUI	Unit
Natural Gas	29	30	kbtu/sf
Electricity	30	84	kbtu/sf
TOTAL	59	115	kbtu/sf

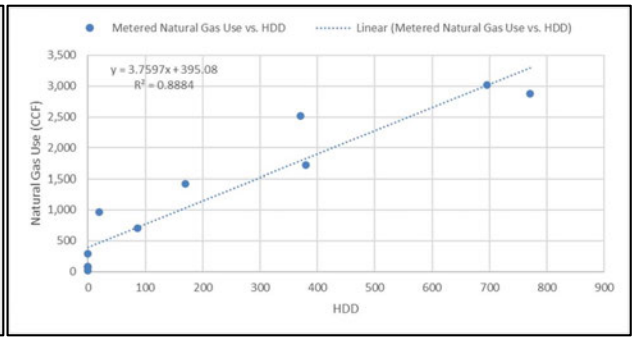
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Source-site ratio per national average, source:
https://portfoliomanager.energystar.gov/pdf/reference/Source%20Energy.pdf

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.

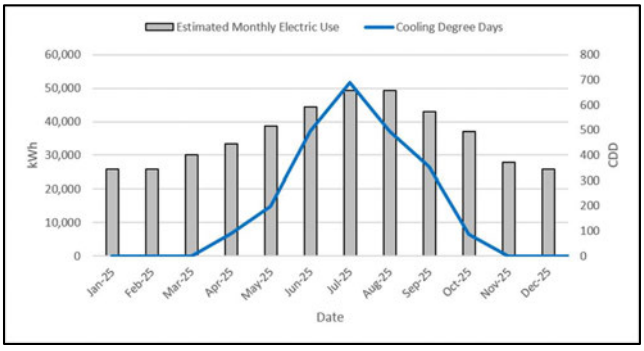
Additionally, data was analyzed to understand the impact of weather (heating degree days (HDD)) and natural gas use (actual metered use) and heating degree days (HDD), as seen below:

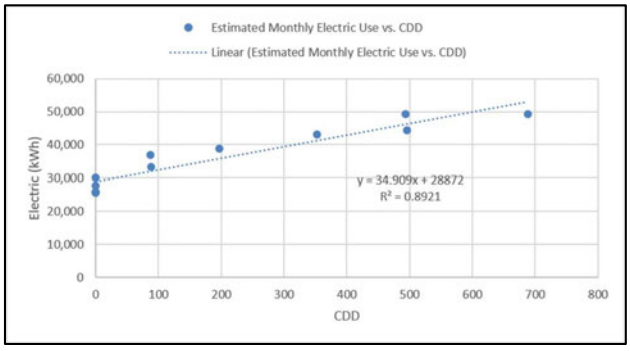




The first graph indicates a strong visual relationship between natural gas use and HDD, suggesting the majority of natural gas is used for building heating. Minor summer month natural gas use can likely be attributed to service hot water. The regression further shows that site natural gas use has a strong, statistically significant relationship to HDD, with an R^2 value of 0.89.

Similar analysis was used with Cooling Degree Days (CDD) to further estimate monthly electrical use. Below are graphs modeling a relationship between site electrical use and cooling degree days:





The regression above 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 0.89 as the sites' 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, suggesting this is a strong model fit.

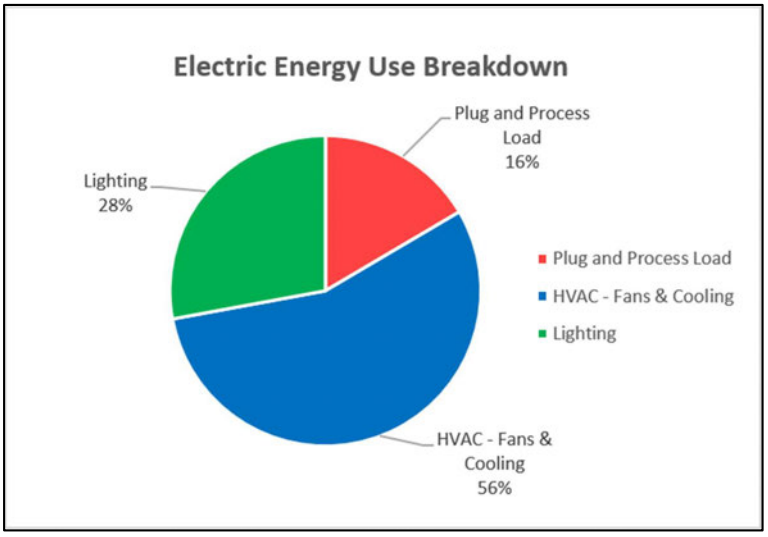
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Mechanical System Energy Use Breakdown

Electric Use

The following electric energy use breakdown was developed. 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. The modeled profile accounts for all estimated electrical use.

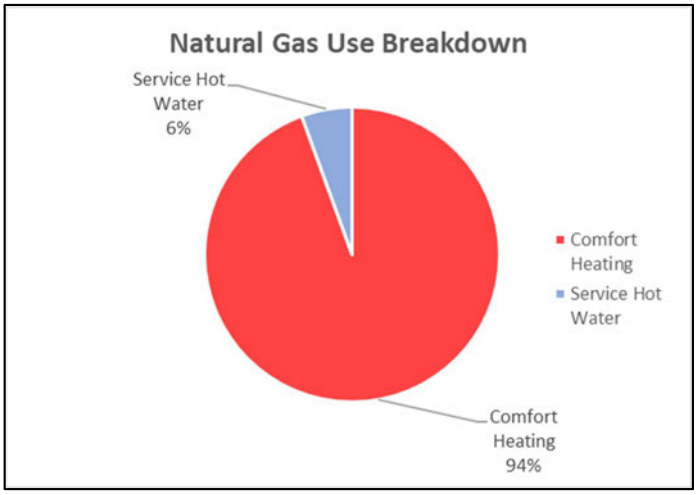


Estimated End Use Breakdown - Electricity	
Electric End Use	**Energy Use (kWh)**
Plug and Process Load	71,000
HVAC - Fans & Cooling	239,000
Lighting	120,000
TOTAL	**430,000**

Natural Gas Use

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.

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End Use Breakdown - Natural Gas	
Natural Gas End Use	**Energy Use (CCF)**
Comfort Heating	17,000
Service Hot Water	1,000
TOTAL	**18,000**

Equipment Inventory:

Site equipment inventories were created based on data gathered during the study walkthrough and provided by facility staff:

Boilers and Pumps:

Eversource Tindall Ave Norwalk Boiler Equipment					
Quantity	**Type**	**Make**	**Model**	**Max Input (MBH)**	**Max Output (MBH)**
1	Hydronic Boiler	Fulton			
2	Hydronic Boiler	Munchkin	199M R2	199	159

Eversource Tindall Ave Norwalk Boiler Pumps		
Description	Quantity	HP
Circulation Pump	2	3

Compressed Air:

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Eversource Tindall Ave Compressor Inventory							
Make	Model	HP	Estimated Capacity (CFM)	Compressor Control Type	Cooling	Voltage	Estimated Annual Run Hours
Hertz	HBD 7	10	39.2	Recip	Air Cooled	460	1,000

Eversource Tindall Ave Dryer Inventory			
Make	Model	Rated CFM	Type
Hertz	HRD-US 40	40	Non-Cycling

HVAC:

Eversource Tindall Ave Equipment Inventory								
Tag	**Type**	**Manufacturer**	**Model**	**Serial #**	**Cooling Ton**	**MBH**	**Fan HP**	**CFM**
RTU-1	Package Roof Top Unit - Natural Gas Heat	Trane	SFHLF25EHU10C5EF7	C20J06187	25		2	
MAU-1	Makeup Air Unit	Greenheck	DG-109-H10	18525918			0.75	
MAU-2	Makeup Air Unit	Greenheck	DG-110-H10	18525925				
AHU-1	Air Handling Unit	Trane	BCHC072E2B0A2	T07L75438	6		2	
AHU-2	Air Handling Unit							
AHU-3	Air Handling Unit	Carrier	40RUSA12A1	251OU14606			2.4	
	Hot Water Heater	Rheem Ruud	E85-12-G	CN0502RR0402E00105		60		
	Chiller	Trane	CGAM040A 2Q02	U18F58895	40		2.5	
	Split System - Outdoor Condesor	Mitsubishi	PUZ-A12NKA7				0.06	1,590
	Split System - Indoor Wall Unit	Mitsubishi	PKA-A12HA7		1	14		
	Split System - Outdoor Condesor	Mitsubishi	SUZ-KA36NAHZ	29U04372			0.1	3,880
	Split System - Indoor Wall Unit	Mitsubishi	SVZ-KP36NA		3	40	0.33	910
	Split System - Outdoor Condesor	Mitsubishi	PUY-A24NHA7	8YU11435A			0.12	635
	Split System - Indoor Wall Unit	Mitsubishi	PKA-A24FA		2			
	Exhaust Fan	Car-Mon	CMB-20	81965			3	2,400
EXH-2	Exhaust Fan	ACME	PR11A8	AN1775				
EF-18	Exhaust Fan	Greenheck	G-180-B-6-1-19-X					
EF-1	Exhaust Fan	Greenheck	CUBE-141-3	18526714			0.33	
EF-2	Exhaust Fan	Greenheck	GB-141-7	18526800			0.75	
	Exhaust Fan	Greenheck	G-090-06	21052806			0.17	
EF-5	Exhaust Fan	Greenheck	GB-180-7-1-30-X	18527120			0.75	
EF-8	Exhaust Fan	Greenheck	GB-180-3-1-30-x	18527176			0.33	
EF-6	Exhaust Fan	Greenheck	GB-180-20-1-30-x	18527168			2	

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Site Energy Efficiency Measures/Recommendations

EEM – 01 – Continue Building Shell Gap Remediation

Discussion with facility staff indicates there are ongoing projects to replace aged windows, as well as evaluate and replace deficient exterior doors (both man doors and bay doors) and door seals. Window replacement is complete on 3 sides of the building, and door seals have been replaced on 1st floor exterior doors and bay doors.

It is recommended that the facility continue with window replacement and door seal replacement, as well as consider survey for the building roof/wall intersections and any exterior wall penetrations:

- Window replacement includes both higher R-value modern glass, as well as new air sealing
- Door seals wear out quickly, allowing outdoor air infiltration
- Roof/wall intersection, especially in aged buildings, allows significant outdoor air infiltration and thermal loss due to the stack effect where pressure differential due to roof elevation drives air movement

Savings were estimated assuming improvements in thermal envelope as well as a reduction in outdoor air infiltration during both heating and cooling seasons, considering the already completed replacement of window systems and door seals:

- **Estimated Annual Energy Savings:** **4,500 kWh and 750 CCF**
- **Estimated Annual Cost Savings:** **$1,000**
- **Estimated Implementation Costs:** **$20,000 including survey costs**

Next Steps:

- Site staff are recommended to continue with ongoing building projects such as window replacement.
- Site staff are encouraged to discuss additional 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 Upgrading CHW and DHW Pumps & Install VFDs

Hot water and chilled water distribution at the building is accomplished with a single duplex pumping plant on a 2-pipe system with seasonal changeover. The pumps are aged and run without controls as a constant volume system.

It is recommended that the site consider replacing the existing pump motors with new higher efficiency motors and VFD controls. VFD control would allow the pumps to modulate power based on actual space heating and cooling demand. The addition of new two-way control valves at the terminal equipment would be required: existing three-way valves allow bypass of the equipment without reducing the flow, while recommended two-way valves would close flow to equipment not calling for heating or cooling, reducing actual system flow, and allowing pumps to modulate speed down to maintain a differential pressure setpoint.

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Existing pumps are believed to run cycling year-round in a lead-lag setup. Savings assume an average 45% reduction pump motor demand and annual electrical energy use. This measure should be considered as an operational improvement as well as for energy savings.

- **Estimated Annual Energy Savings:** 4,000 kWh
- **Estimated Annual Cost Savings:** $600
- **Estimated Implementation Costs:** $27,000

Next Steps:

- Datalogging is recommended to confirm equipment loading assumptions and schedules.
- The site is encouraged to discuss potential control upgrades with a reputable mechanical/controls vendor.

EEM – 03 – Electrification - Convert Hot Water Unit Heaters with Split Systems

Existing supplemental heating-only equipment consists of multiple HW unit heaters. It is recommended that facility staff consider replacement of these older units with split system heating and cooling or air source heat pumps. In addition to replacing the heating source for greenhouse gas reduction and reducing maintenance requirements, cooling could also be added to these spaces.

Savings assume an estimated annual heating load to these units only of ~5,000 CCF:

- **Estimated Annual Energy Savings:** 5,000 CCF and -41,000 kWh
- **Estimated Annual Cost Savings:** n/a
- **Estimated Implementation Costs:** $75,000

Next Steps:

- Eversource should review equipment selection with a mechanical vendor or local supplier if planning to self-install.
- The site should also discuss this effort with a utility representative to determine potential electrification incentives.

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

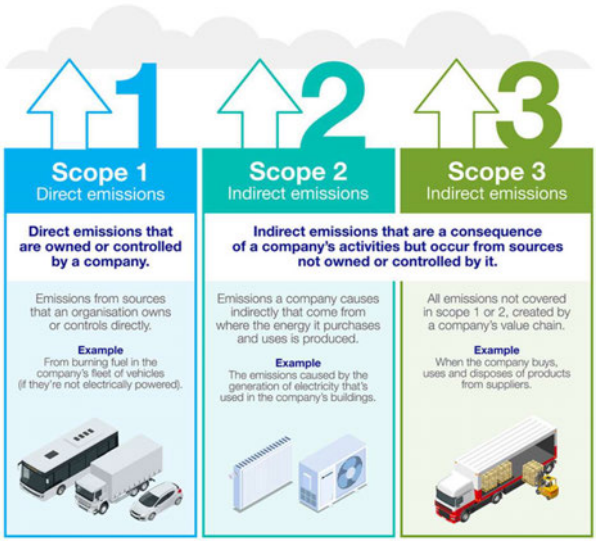
Site and portfolio sustainability is best guided by the framework and methodology set forth in ASHRAE Standard 228-2023 *Standard Method of Evaluating Zero Net Energy and Zero Net Carbon Building Performance* (available for purchase here: https://www.ashrae.org/technical-resources/bookstore/ansi-ashrae-standard-228-standard-method-of-evaluating-zero-net-energy-and-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:

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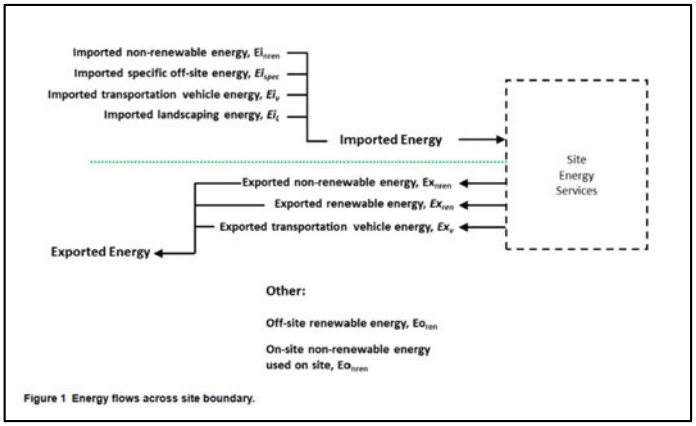
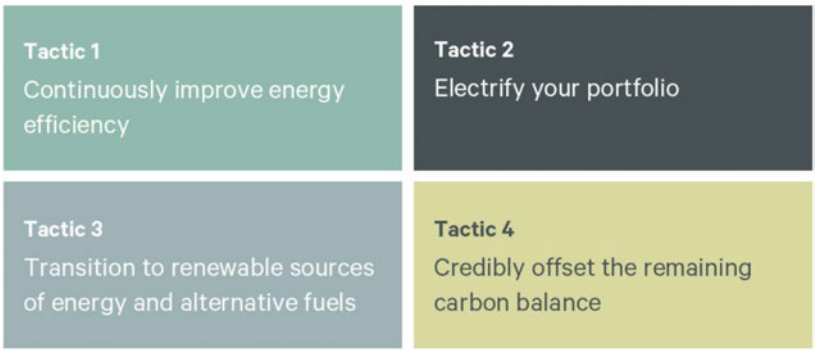


Figure 1 Energy flows across site boundary.

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:

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ESCT Tindall Ave 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. This step has not been addressed at the target site aside from split system cooling and electric unit heaters in some areas.

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:
  - Complete building shell projects and additional survey/repair
  - HVAC pump motor replacement and the addition of VFDs
  - Unit heater replacement with some form of heat pump technology
- 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.

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  - And identify potential utility program offerings that can help offset site costs.
- 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.
- Coordinate with the utility representatives regarding setting up proposals for focused studies to further pursue specific upgrades. Site/utility programs may potentially require additional metering and analysis of identified measure to obtain more accurate savings number – QGM can assist as needed.
- Coordinate with utility representatives about developing applications for measures that do not require follow-on TA studies.