



Energy Audit Report

REPORT DATE: March 26, 2025

PROPERTY INFORMATION:

Public Safety Building
37 Firefly Lane
Bar Harbor, Hancock County, Maine 04609

PROJECT INFORMATION:

AEI Project No. 498447
Site Assessment Date: October 2, 2024

PREPARED FOR:

Town of Bar Harbor
93 Cottage Street
Bar Harbor, Maine 04609

PREPARED BY:

AEI Consultants - Corporate Headquarters
2500 Camino Diablo
Walnut Creek, California 94597



March 26, 2025

James Smith
Town of Bar Harbor
93 Cottage Street
Bar Harbor, Maine 04609

Subject: **Energy Audit Report**
Public Safety Building
37 Firefly Lane
Bar Harbor, Maine 04609
AEI Project No. 498447

Dear James Smith:

AEI Consultants is pleased to provide the *Energy Audit Report* of the above referenced property. This assessment was authorized and performed in accordance with the scope of services engaged.

We appreciate the opportunity to provide services to you. If you have any questions concerning this report, or if we can assist you in any other matter, please contact me at (201) 332-1844 or bmorgan@aeiconsultants.com.

Sincerely,

A handwritten signature in black ink that reads "Brian Morgan". The signature is written in a cursive, flowing style.

Brian Morgan
Business Development Manager
AEI Consultants

TABLE OF CONTENTS

1.0 CERTIFICATION/DISCLAIMER	4
2.0 EXECUTIVE SUMMARY	5
2.1 Purpose and Scope	5
2.2 Significant Assumptions	5
2.3 Limitations	6
2.4 Reliance	6
2.5 Financial Analysis Definitions	6
2.6 Summary of Building Performance	7
2.7 Recommended Energy and Water Efficiency Measures (EWEM)	9
3.0 BACKGROUND	11
3.1 General Property Description	11
3.2 Existing Energy and Water Efficiency Measures	14
3.3 Space Type and Usage Schedules	14
4.0 UTILITY ANALYSIS	15
4.1 Utility Providers	15
4.2 Energy End Use Analysis	23
4.3 Energy & Water Benchmarking	23
5.0 BUILDING SYSTEMS	25
5.1 Envelope	25
5.2 Lighting	25
5.3 Building Mechanical Systems	27
5.4 Appliances	29
5.5 Laundry Equipment	30
6.0 RECOMMENDED EWEMS	33
6.1 EWEMs	33
7.0 GHG EMISSIONS ANALYSIS	42
7.1 eGRID Subregions	42
7.2 Baseline Scope 1 and Scope 2 GHG Emissions	42
7.3 GHG Emissions Reduction per EWEM	44
8.0 FINANCIAL INCENTIVES	46
8.1 State Level Incentives	46
8.2 Federal Incentives	61
9.0 SIGNATURES OF PARTICIPATING PROFESSIONALS	64

TABLE OF APPENDICES

- APPENDIX A: PROPERTY PHOTOGRAPHS
- APPENDIX B: SUPPORTING DOCUMENTATION
- APPENDIX C: EWEM CALCULATION WORKSHEETS
- APPENDIX D: PROJECT TEAM

1.0 CERTIFICATION/DISCLAIMER

AEI has completed an Energy Audit for the Property located at 37 Firefly Lane, Bar Harbor, Hancock County, Maine (the "Property"). AEI visited the site on October 2, 2024.

The energy conservation opportunities contained in this report have been reviewed for technical accuracy. The reader is reminded that energy savings ultimately depend on variable factors including occupant behavior, weather, and quality of installation. Estimated installation costs are based on a variety of sources, including our own experience at similar facilities, our own pricing research using local contractors and vendors, and cost handbooks such as those produced by RS Means. The cost estimates represent the best judgment of the auditors for the proposed action. The Owner is encouraged to confirm these cost estimates independently since actual installed costs can vary widely for a particular installation. AEI does not guarantee installed cost estimates and shall in no event be liable should actual installed costs vary from the estimated costs herein.

AEI does not guarantee the costs savings estimated in this report. AEI shall in no event be liable should the actual energy savings vary from the savings estimated herein.

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

2.0 EXECUTIVE SUMMARY

AEI Consultants (AEI) was retained by Town of Bar Harbor to conduct an ASHRAE Level II Energy Audit, in conformance with the scope and limitations of ASHRAE *Procedures for Commercial Building Energy Audits*, Second Edition (2011), ANSI/ASHRAE/ACCA Standard 211-2018, *Standard for Commercial Building Energy Audits* for the Property located at 37 Firefly Lane, Bar Harbor, Hancock County, Maine (the "Property").

2.1 PURPOSE AND SCOPE

AEI has comprehensively analyzed the Property to identify possible areas where Energy and Water may be conserved. The areas considered include HVAC equipment, lighting, domestic water heating, appliances, fenestration, insulation, roofing, bathroom fixtures, and miscellaneous equipment.

Utility Analysis

AEI has performed a comprehensive utility analysis to determine the buildings' Energy and Water consumption. The study utilizes at least 12 months of utility bills. Energy and water consumption baselines were determined by observing peak loads during the year.

Energy Audit Process

Where possible, in addition to the Site Survey, AEI has utilized construction drawings, interviews, and maintenance records to determine the energy performance of the building and its associated mechanical, electrical, and HVAC equipment.

Accuracy of Analysis

AEI utilized spreadsheet calculations to estimate savings based on the actual conditions of the facility and its energy-consuming equipment. Simple payback is calculated by dividing the new equipment's total labor and material cost by the yearly cost savings. AEI shall not be responsible for equipment that may not reach the end of its useful life or costs more to operate than noted in the Energy Efficiency Measures.

Current Energy Code

The energy codes adopted by at the time of this report are the 2015 International Energy Conservation Code (2015 IECC) and ASHRAE 90.1-2013 for Commercial construction.

2.2 SIGNIFICANT ASSUMPTIONS

The following assumptions are made by AEI in this report. AEI relied on information derived from secondary sources including governmental agencies, the client, designated representatives of the client, property contact, property owner, property owner representatives, computer databases, and personal interviews. AEI has reviewed and evaluated the thoroughness and reliability of the information derived from secondary sources including government agencies, the client, designated representatives of the client, property contact, property owner, property owner representatives, computer databases, or personal interviews. It appears that all information obtained from outside sources and reviewed for this assessment is thorough and reliable. However, AEI cannot guarantee the thoroughness or reliability of this information.

2.3 LIMITATIONS

Available information has been analyzed using currently accepted assessment techniques and it is believed that the inferences made are reasonably representative of the Property. AEI makes no warranty, expressed or implied, except that the services have been performed in accordance with generally accepted industry practices applicable at the time and location of the study.

Responses received from local government agencies or other secondary sources of information after the issuance of this report may change certain facts, findings, conclusions, or circumstances to the report. A change in any fact, circumstance, or industry-accepted procedure upon which this report was based may adversely affect the findings, conclusions, and recommendations expressed in this report.

2.4 RELIANCE

All reports, both verbal and written, are for the benefit of Town of Bar Harbor. This report is for the purpose of evaluating the subject Property in connection with securing mortgage financing and has no other purpose. This report may not be relied upon by any other person or entity without the written consent of AEI either verbally or in writing. In the absence of a written agreement with AEI granting such rights, no third parties shall have rights of recourse or recovery whatsoever under any course of action against AEI, its officers, employees, vendors, successors or assigns.

Reliance is provided in accordance with Town of Bar Harbor and AEI's contract and Terms and Conditions dated August 28, 2024. The limitation of liability defined in the contracted terms is the aggregate limit of AEI's liability to the client and all relying parties.

2.5 FINANCIAL ANALYSIS DEFINITIONS

Simple Payback = The estimated installation cost divided by the calculated annual cost avoidance.

EUL = Estimated Useful Life of components and systems as determined by manufacturers, ASHRAE, HUD, Fannie Mae, Freddie Mac and other authorities.

SIR = Savings to Investment Ratio; $(EUL \times \text{Annual Savings}) \div \text{Initial Cost}$

ROI = Return on Investment; $(EUL \times \text{Annual Savings} - \text{Initial Cost}) \div \text{Initial Cost}$

IRR = Internal Rate of Return; the annual yield from a project, usually expressed as a percentage of the total amount invested; the compound rate of interest which, when used to discount cash flows, will result in zero net savings. If the IRR is greater than the investor's stated discount rate, the measure is considered beneficial.

NPV = Net Present Value; The value (the gain minus the cost) of an investment in today's dollars over some specified time period. If the investment has a positive NPV, it is generally considered to be beneficial.

2.6 SUMMARY OF BUILDING PERFORMANCE

The following table summarizes the current and proposed building performance with the recommended Energy and Water Efficiency Measures (EWEMs) described in the following section.

EWEM Summary Table		
Current Building Energy Usage	911,961	kBtu
Current Building Energy Cost	\$19,727	\$\$\$
Proposed Energy Savings	140,643	kBtu
Proposed Energy Cost Savings	\$3,571	\$
Energy Savings	15.4%	%
Energy Cost Savings	18.1%	%
Investment for EEM's	\$41,608	\$
Payback for Investments (without water savings)	11.7	Years
Payback for Investments (including water savings)	9.1	Years
Site Energy Use		
Current Electric Site Energy	126,597	kWh
Proposed Electric Savings	16,058	kWh
Proposed Electric Savings	12.7%	%
Current Fuel Oil Site Energy	3,176	Gallons
Proposed Fuel Oil Savings	3,176	Gallons
Proposed Fuel Oil Savings	100.0%	%
Current Propane Site Energy	438	Gallons
Proposed Propane Savings	-3,870	Gallons
Proposed Propane Savings	-883.5%	%
Site Energy Use Intensity		
Total Building Area	16,722	SF
Current Site Energy Use Intensity	54.5	kBtu/SF
Proposed Site Energy Use Intensity	46.1	kBtu/SF
Source Energy Use Intensity		
Current Source Energy Use Intensity	74.8	kBtu/SF
Proposed Source Energy Use Intensity	39.0	kBtu/SF
Site Greenhouse Gas Emissions		
Current Site GHG Emissions	66.09	MTCO ₂ e/Yr
Proposed Site GHG Emissions	51.71	MTCO ₂ e/Yr
Water and Sewer Usage		
Current Usage	621	kGal
Current Cost	\$11,868	\$
Proposed Savings in kGal	53	kGal
Cost Per kGal	\$19.10	\$
Proposed Cost Savings	\$1,005	\$
Percent Water and Cost Savings	8.5%	%

2.7 RECOMMENDED ENERGY AND WATER EFFICIENCY MEASURES (EWEM)

The following recommended EWEMs have been analyzed using calculations based on occupant usage, localized climate conditions, HVAC and ventilation operating hours, and lighting hours. The HVAC operating hours are approximations and may vary depending on the severity of the weather. Water consumption is based on the number of occupants and assumed running times for water consuming devices. The EWEM table shows the initial investment cost, energy and water consumption and cost savings, estimated equipment expected useful life (EUL), investment simple payback, savings to investment ratio (SIR), and return on investment (ROI) for each EWEM. The utility cost increase over the life of the EWEMs implemented was not considered as a factor in the financial analysis for each measure. Any analyzed EWEMs with a Savings to Investment Ratio less than 1.0 (or a negative Return on Investment) are not included in this table.

Energy And Water Efficiency Measures (EWEM) Summary

EWEM #	Energy And Water Efficiency Measures (EWEM) Summary Description	Initial Cost (\$)	Electric Savings (kWh)	Fuel Oil Savings (Gal)	Propane Savings	Water/ Sewer Savings (kGal)	Annual Utility Cost Savings (\$)	Simple Pay Back (Years)	Expected Useful Life (Years)	SIR	ROI	% Energy Savings	% Water Savings	Projected GHG Emissions Reduction MTCO2e	kBTU Savings
1	Replace the existing 82% efficient Fuel Oil #2 Boiler in the Police Station with a new 98% efficient Propane-fired boiler.	\$12,006	0	523	-618	0	\$231	6.1	25	0.48	-0.52	1.7%	0.0%	1.9	15,838
2	Replace the existing 75% efficient Fuel Oil #2 Boiler in the Fire Station with a new 96% efficient Propane-fired boiler.	\$24,218	0	2,654	-3,361	0	\$734	33.0	25	0.76	-0.24	6.6%	0.0%	8.1	60,002
3	Retrofit Interior Lighting Fixtures with DLC Certified LED Lamps.	\$938	8,201	0	0	0	\$1,222	0.77	10	13.03	12.03	3.1%	0.0%	2.0	27,983
4	Replace Exterior Lighting Fixtures with Bi-Level Linear LED Lighting Fixtures.	\$497	1,073	0	0	0	\$160	3.1	10	3.22	2.22	0.4%	0.0%	0.3	3,663
5	Replace 1 Existing Electric Water Heater with 1 Hybrid Heat Pump Water Heater (HPWH) with a minimum UEF of 4.	\$3,129	4,589	0	0	0	\$683	4.58	15	3.27	2.27	1.7%	0.0%	1.1	15,658
6	Add R-5.4 insulation to 100 LF of 1 inch diameter domestic hot water piping, including flexible connectors, tees, and valves. ARMAFLEX 3/4 - inch wall thickness or equivalent insulation values	\$768	0	0	109	0	\$214	3.6	10	2.79	1.79	1.1%	0.0%	0.6	10,010
7	Replace 1 Existing Kitchen Faucet Aerators With 1.5 GPM Low Flow Aerators. Aerator housings must bear 1.5 GPM manufacturer flow ratings. *The savings and payback shown for this measure assume that EWEMs #1 & #2 have been implemented.	\$16.75	287	0	0	7.3	\$182	0.09	10	108.78	107.78	0.1%	1.2%	0.1	979
8	Replace 1 Existing Higher Flow Showerheads With 1.5 GPM WaterSense Labeled Showerheads. Showerheads must bear the manufacturer flow ratings. *The savings and payback shown for this measure assume that EWEMs #1 & #2 have been implemented.	\$18.75	1,266	0	0	29.2	\$746	0.03	10	398.09	397.09	0.5%	4.7%	0.3	4,320
9	Replace 6 Existing Bathroom Faucet Aerators With 0.5 GPM WaterSense Labeled Low Flow Aerators. Aerator housings must bear 0.5 GPM manufacturer flow ratings. *The savings and payback period shown for this measure assume that EWEM #5 has been implemented.	\$16.75	642	0	0	16.1	\$404	0.04	10	241.06	240.06	0.2%	2.6%	0.2	2,189
Totals =		\$41,608	16,058	3,176	-3,869.6	53	\$4,577	9.1	n/a	n/a	n/a	15.4%	8.5%	14.5	140,643

3.0 BACKGROUND

3.1 GENERAL PROPERTY DESCRIPTION

The Public Safety facilities comprise three distinct buildings: the Fire and Police Station, the Island Tours building, and the Port Security office building.

- **Fire and Police Station:** This combined facility, located at 37 Firefly Lane in a commercial area of Bar Harbor, Maine, is a 3-story building with a total gross building area of 14,005 square feet. The original Fire Station building was constructed in 1911, and the Police Station addition was added in 1988. This building underwent a substantial renovation in 2020.
- **Island Tours Building:** This 1900-built 475-square-foot building is at 19 Fire Fly Lane and is currently leased to the Island Tours Company.
- **Port Security Building:** Located at 21 Ells Pier Drive, this 2,242-square-foot building, built in 2012, serves as office space for Port Security.

The combined gross building area totals 16,722 square feet. The Fire Station, Police Station, and Island Tours building occupy a one-acre lot.

The site contact was David Kearns; phone: (207) 288-3391.



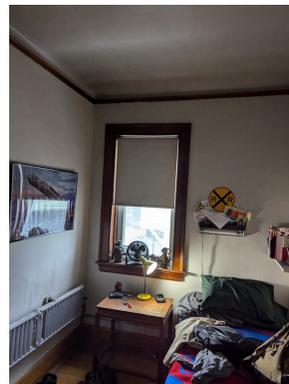
Fire Station Exterior



Fire Station Interior



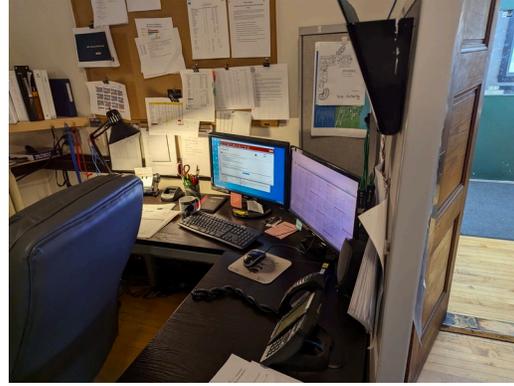
Fire Station Interior



Fire Station Interior



Fire Station Interior



Fire Station Interior



Fire Station Garage



Interior Building Shell



Port Security Exterior



Port Security Interior



Port Security Interior



Port Security Exterior



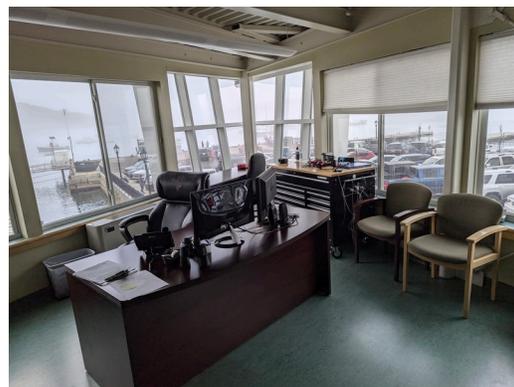
Port Security Interior Office Area



Port Security Interior Shell



Port Security Interior Shell



Port Security Interior



Port Security Exterior Shell



Pier Comfort Station Shell

3.2 EXISTING ENERGY AND WATER EFFICIENCY MEASURES

The following existing energy and water efficiency improvements were observed at the Property:

1. High Efficiency Mini-Split Heat Pumps in Police and Fire Station and Port Security Building
2. LED Interior Lighting in Police and Fire Station
3. Exterior LED Lighting

3.3 SPACE TYPE AND USAGE SCHEDULES

The following table lists the space types, estimated number of occupants, and typical occupied hours of operation per week.

Space	# of Occupants	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Police Station	5	24/7	24/7	24/7	24/7	24/7	24/7	24/7
Fire Station	5	24/7	24/7	24/7	24/7	24/7	24/7	24/7
Port Security	2	24/7	24/7	24/7	24/7	24/7	24/7	24/7

3.3.1 SPACE TYPE BREAKDOWN

The following table shows the unit types, unit quantities, unit square footage, and the total square footage per unit type.

Unit Type	Total Area (SF)
Fire Station First Floor	3,900
Fire Police Station Upper Story	3,900
Fire Police Station Unfinished Basement	3,900
Police Station	2,305
Leased Building (Island Tour Co.)	475
Port Security First Floor	1,121
Port Security Upper Story	1,121
Total Gross SF	16,722

4.0 UTILITY ANALYSIS

4.1 UTILITY PROVIDERS

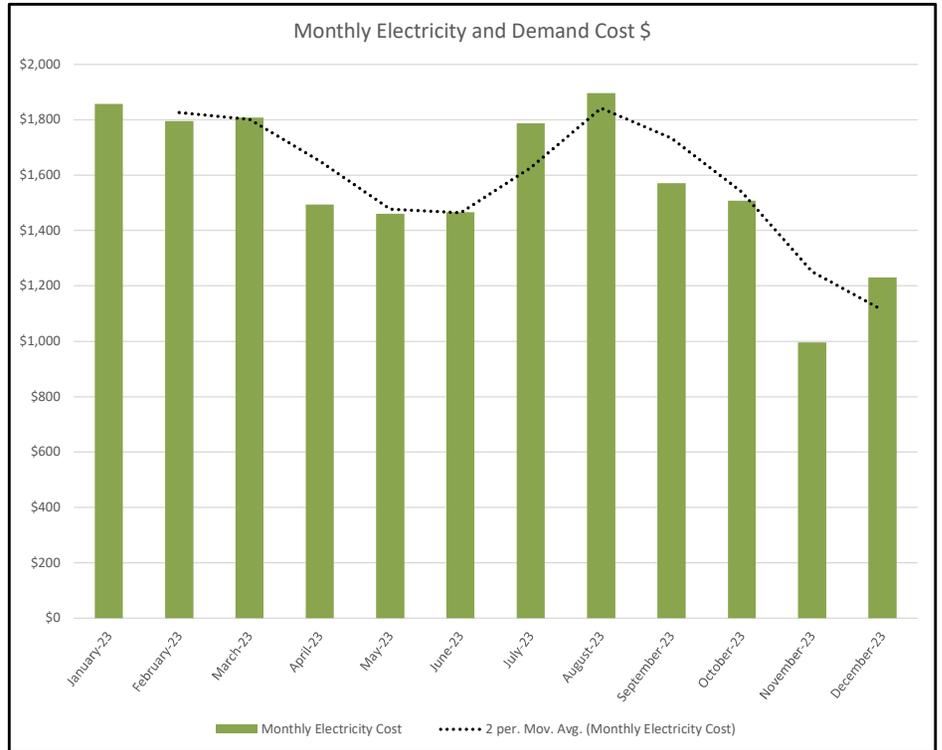
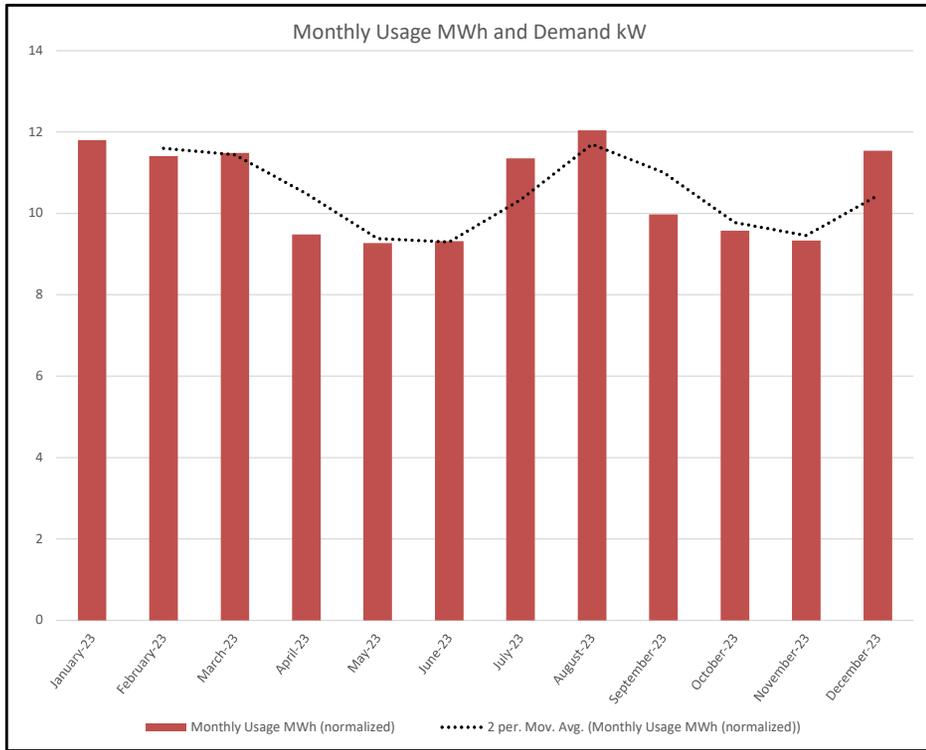
Utility Type	Utility Provider Name
Electricity	Constellation NewEnergy
Natural Gas	No Frills Energy
Propane	No Frills Energy
Fuel Oil	No Frills Oil
Water / Sewer	Town of Bar Harbor

4.1.1 ELECTRICITY

The following utility analysis covers the period from January 2023 to December 2023 and is based on bills obtained from the property owner. Monthly electricity consumption and cost were provided for

. The estimated combined electrical consumption and cost of the three buildings are shown below. The cost per kWh is calculated in the fourth column. The bottom row shows the annual electrical energy consumption and cost.

Billing Month & Year	Monthly Electricity Usage (kWh)	Monthly Electricity Cost	Cost per kWh	kBTU Usage (kWh x 3.41)
January-23	11,794	\$1,857	\$0.16	40,241
February-23	11,404	\$1,795	\$0.16	38,910
March-23	11,484	\$1,808	\$0.16	39,183
April-23	9,488	\$1,494	\$0.16	32,373
May-23	9,277	\$1,460	\$0.16	31,653
June-23	9,319	\$1,467	\$0.16	31,796
July-23	11,355	\$1,788	\$0.16	38,743
August-23	12,043	\$1,896	\$0.16	41,091
September-23	9,975	\$1,570	\$0.16	34,035
October-23	9,576	\$1,508	\$0.16	32,673
November-23	9,339	\$996	\$0.11	31,865
December-23	11,543	\$1,230	\$0.11	39,385
Annual Electricity Usage & Cost:	126,597	\$18,869	\$0.15	431,949

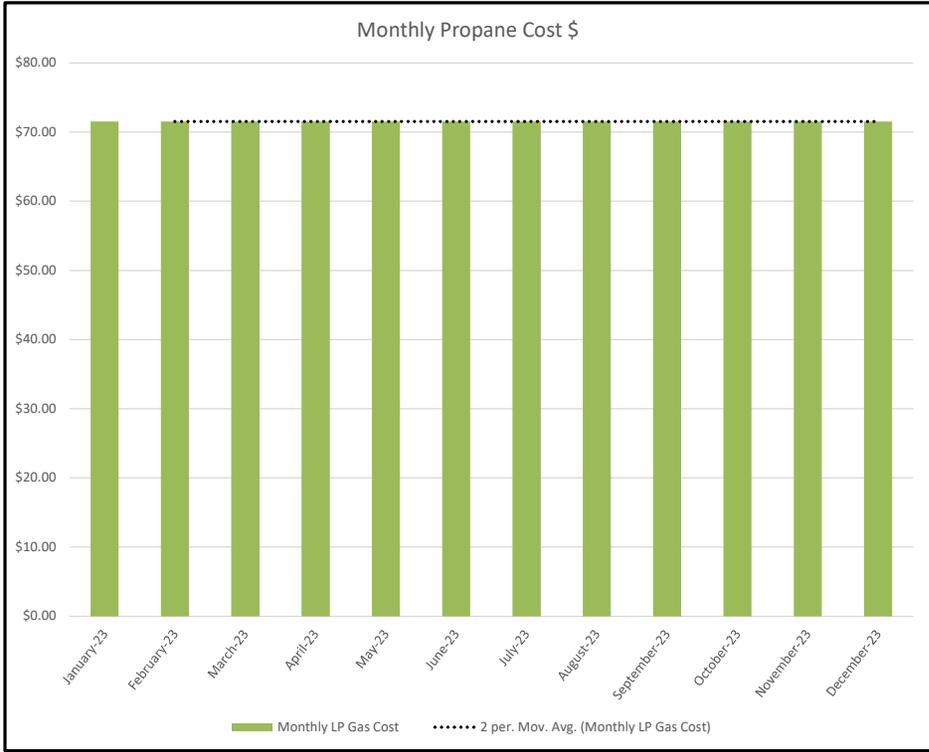
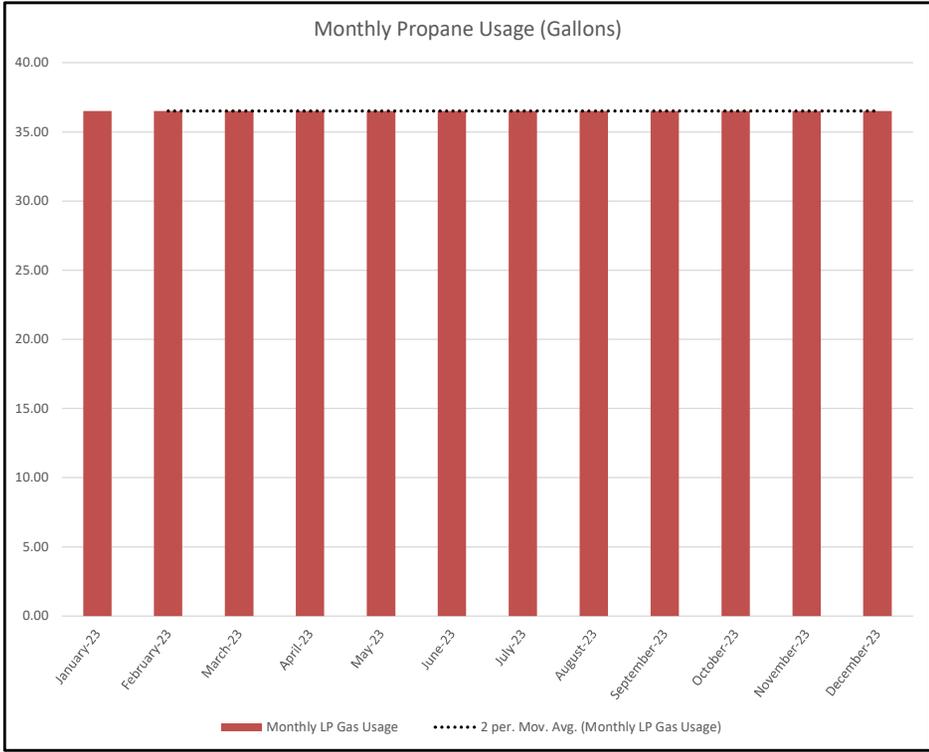


4.1.2 LP GAS

Propane delivery data was not provided.

The chart below shows the estimated monthly consumption and cost of the liquefied petroleum (LP) gas for the Property. The cost per Gal is calculated in the fourth column. The bottom row shows the estimated annual LP gas consumption and cost for the Property.

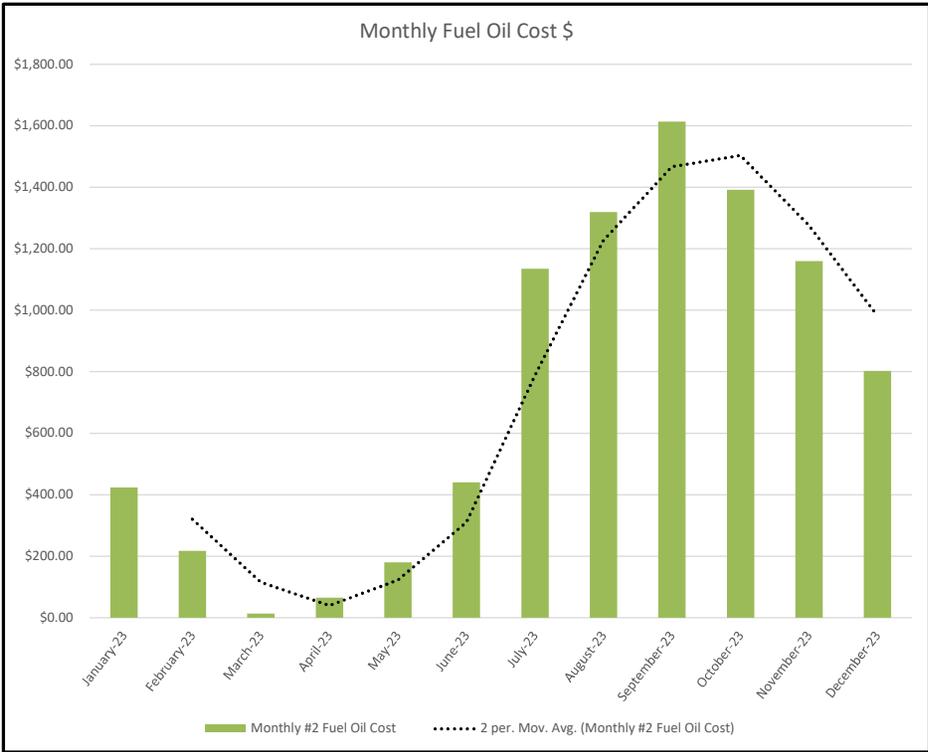
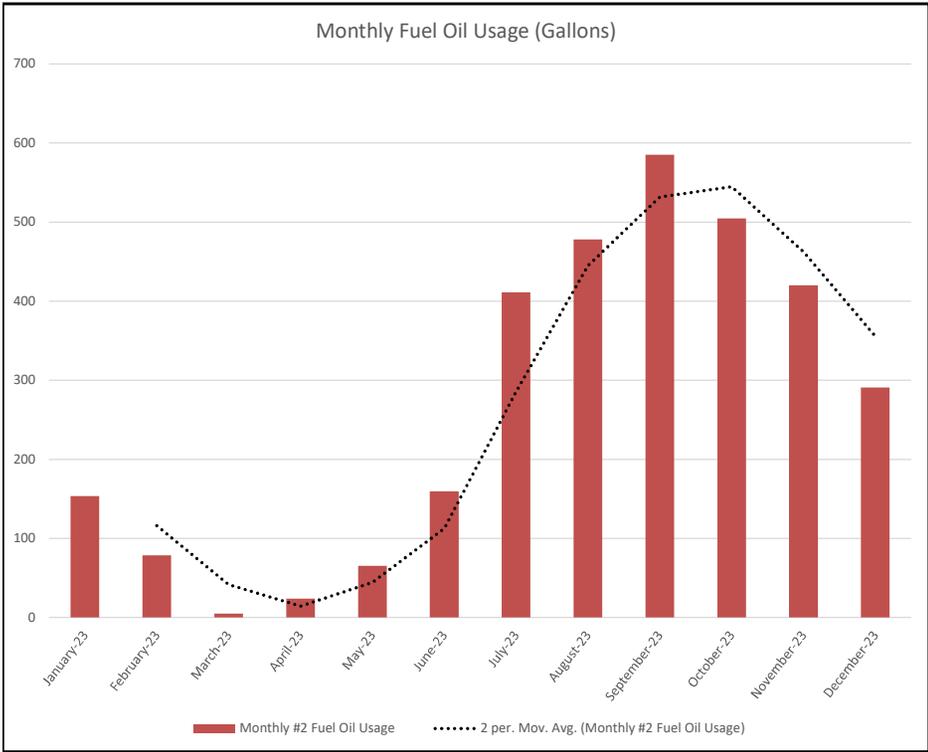
Billing Month & Year	Monthly LP Gas Usage (Gal)	Monthly LP Gas Cost	Cost per Gal	kBTU Usage (Gal x 91,547)
January-23	37	\$72	\$1.96	3,340
February-23	37	\$72	\$1.96	3,340
March-23	37	\$72	\$1.96	3,340
April-23	37	\$72	\$1.96	3,340
May-23	37	\$72	\$1.96	3,340
June-23	37	\$72	\$1.96	3,340
July-23	37	\$72	\$1.96	3,340
August-23	37	\$72	\$1.96	3,340
September-23	37	\$72	\$1.96	3,340
October-23	37	\$72	\$1.96	3,340
November-23	37	\$72	\$1.96	3,340
December-23	37	\$72	\$1.96	3,340
Annual LP Gas Delivery (Gal) and Cost:	438.00	\$858	\$1.96	40,077



4.1.3 FUEL OIL

The chart below shows the monthly consumption and cost of the #2 Fuel Oil for the Property. The cost per Gal is calculated in the fourth column. The bottom row shows the annual Fuel Oil consumption and cost for the Property.

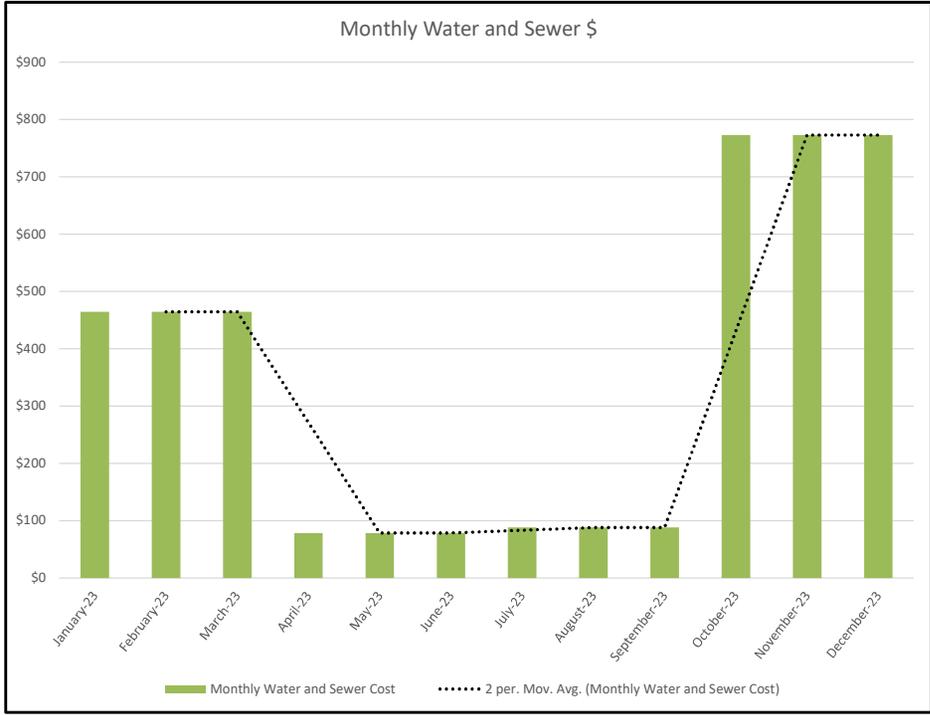
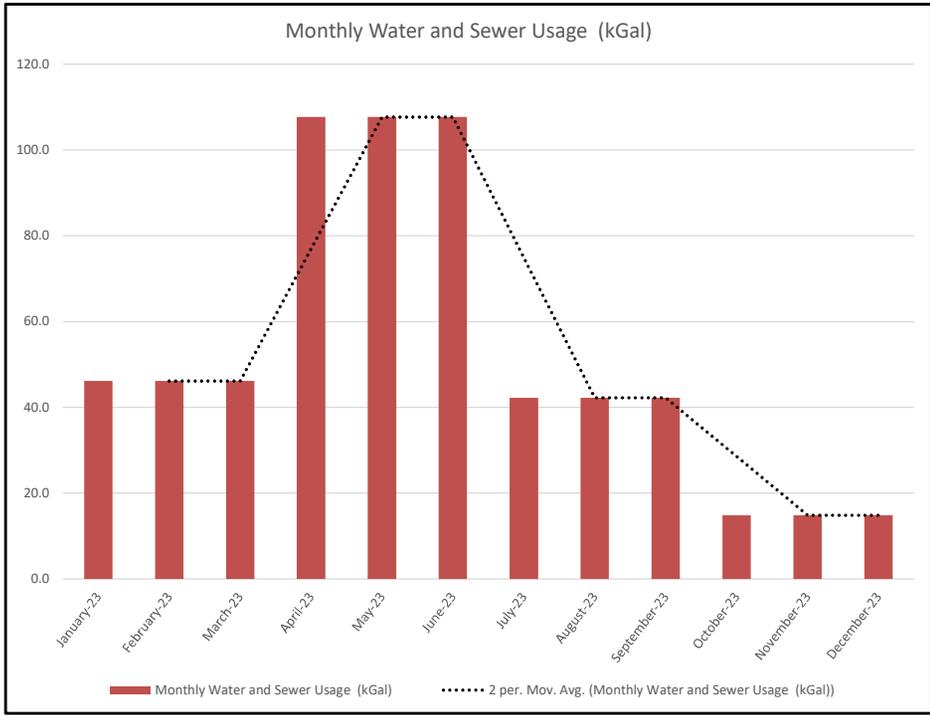
Billing Month & Year	Monthly Fuel Oil Cost	Monthly Fuel Oil Usage (Gal)	Cost per Gal	kBTU Usage (Gal x 138,874)
May-23	154	\$424	\$2.76	21,272
June-23	79	\$217	\$2.76	10,899
July-23	5	\$14	\$2.76	679
August-23	24	\$66	\$2.76	3,293
September-23	65	\$180	\$2.76	9,028
October-23	160	\$440	\$2.76	22,092
November-23	411	\$1,135	\$2.76	56,979
December-23	478	\$1,319	\$2.76	66,238
January-24	585	\$1,614	\$2.76	81,025
February-24	505	\$1,392	\$2.76	69,896
March-24	420	\$1,160	\$2.76	58,216
April-24	291	\$803	\$2.76	40,301
May-23	154	\$424	\$2.76	21,272



4.1.4 WATER AND SEWER

The chart below shows the monthly consumption and cost of the water and sewer for the Property. The cost per kGal is calculated in the far-right column. The bottom row shows the annual water and sewer consumption and cost for the Property.

Billing Month & Year	Monthly Water and Sewer Usage (kGal)	Monthly Water and Sewer Cost	Cost per kGal
April-23	43.1	\$830	\$19.25
May-23	43.1	\$830	\$19.25
June-23	43.1	\$830	\$19.25
July-23	107.7	\$1,817	\$16.87
August-23	107.7	\$1,817	\$16.87
September-23	107.7	\$1,817	\$16.87
October-23	42.2	\$923	\$21.85
November-23	42.2	\$923	\$21.85
December-23	42.2	\$923	\$21.85
January-24	14.1	\$387	\$27.42
February-24	14.1	\$387	\$27.42
March-24	14.1	\$387	\$27.42
Annual Water and Sewer Usage & Cost:	621.4	\$11,868	\$19.10



4.2 ENERGY END USE ANALYSIS

The following table shows the estimated end use analysis for all energy utilities on the Property.

4.3 ENERGY & WATER BENCHMARKING

Because the buildings associated with this report are not eligible for an Energy Star Score, these properties have not been benchmarked in Energy Star Portfolio Manager.

The existing site EUI of these properties is 54.5 kBtu/Sq. Ft.. If all of the EWEMs proposed in this report are implemented, it is estimated that the new site EUI would be 46.1 kBtu/Sq. Ft..

The Following table shows a breakout of the estimated water consumption.

Assumptions																	
Fixture	Fuel	Minimum Rate	Maximum Rate	Actual Use Rate	Flowrate	Period	Desired Hot Water Temperature	Hot Water Mix %	Number Occupants	Hot Water Gallons/ Year	HW Gal/ Person/ Day	Cold Water Gallons/ Year	Total Gallons/ Year	Total Gal/ Person/ Day	New Flow Rates	Total Water Savings	Hot Water Savings
Adoption Rate (Range of %)		75%	100%	100%													
Kitchen Sink W/dishwasher	Electricity	2 min/occ/day	6 min/occ/day	4 min/occ/day	2 GPM	365 days/year	105	62%	10	18,214 Gal	5.0	10,986 Gal	29,200 Gal	8.0 Gal	1.5 Gal	7,300 Gal	4,553 Gal
Kitchen Sink W/O dishwasher	Electricity	8 min/occ/day	8 min/occ/day	8 min/occ/day	0 GPM	365 days/year											
Dishwasher	Electricity	0.2 cycles/occ/day	0.2 cycles/occ/day	0.2 cycles/occ/day	3.5 Gal/cycle	365 days/year	135	100%	10	2,555 Gal	0.7	0 Gal	2,555 Gal	0.7 Gal			
Shower	Electricity	6 min/occ/day	8 min/occ/day	8 min/occ/day	2.5 GPM	365 days/year	110	69%	10	50,112 Gal	13.7	22,888 Gal	73,000 Gal	20.0 Gal	1.5 Gal	29,200 Gal	20,045 Gal
Police & Fire Toilets	N/A	3 flushes/occ/day	3 flushes/occ/day	3 flushes/occ/day	1.28 GPM	365 days/year	55	0%	10	0 Gal	0.0	14,016 Gal	14,016 Gal	3.8 Gal			
Police & Fire Urinals	N/A	0 flushes/occ/day	6 flushes/occ/day	3 flushes/occ/day	0.125 GPF	365 days/year	55	0%	10			1,369 Gal	1,369 Gal	0.4 Gal			
P&F Lavatory Sinks	Electricity	1 min/occ/day	6 min/occ/day	4 min/occ/day	1.5 GPM	365 days/year	105	62%	10	13,660 Gal	3.7	8,240 Gal	21,900 Gal	6.0 Gal	0.5 Gal	14,600 Gal	9,107 Gal
Residential Clothes Washer	Electricity	0.1 Loads/occ/day	0.4 Loads/occ/day	0.1 Loads/occ/day	15.0 Gal/cycle	365 days/year	135	80%	10	4,380 Gal	1.2	1,095 Gal	5,475 Gal	1.5 Gal			
Residential Laundry Dryer	Electricity	0.1 Loads/occ/day	0.4 Loads/occ/day	0.1 Loads/occ/day		365 days/year											
Commercial Clothes Washers	Electricity	0.1 Loads/occ/day	0.4 Loads/occ/day	0.1 Loads/occ/day	28.0 Gal/cycle	365 days/year	145	80%	10	8,176 Gal	2.2	2,044 Gal	10,220 Gal	2.8 Gal			
Truck Wash	N/A			0.76 hour/ wash	180 GPM	52 days/year	55	0%	10	0 Gal		424,008 Gal	424,008 Gal	116.2 Gal			
Comfort Station Toilets	N/A			1 flushes/occ/day	1.28 GPF	365 days/year			50	0 Gal	0.0	23,360 Gal	23,360 Gal	1.3 Gal			
Comfort Station Urinals	N/A			1 flushes/occ/day	0.1 Gal/cycle	365 days/year			25	0 Gal	0.0	1,141 Gal	1,141 Gal	0.1 Gal			
Comfort Station Sinks	Electricity	0.1 Loads/occ/day	0.4 Loads/occ/day	0.5 min/occ/day	0.5 GPM	365 days/year	105	50%	75	3,415 Gal	0.9	3,429 Gal	6,844 Gal	0.3 Gal			
Port Security Bathroom Sinks	Electricity	1 min/occ/day	6 min/occ/day	2.1 min/occ/day	2.2 GPM	365 days/year	110	69%	2	2,315 Gal	0.6	1,057 Gal	3,373 Gal	4.6 Gal	0.5 Gal	1,533 Gal	1,052 Gal
Port Security Toilets	N/A	1 flushes/occ/day	1 flushes/occ/day	4 flushes/occupant/day	1.28 GPF	365 days/year	55	0%	2	0 Gal	0.0	3,738 Gal	3,738 Gal	5.1 Gal	0.6 Gal	2,920 Gal	0 Gal
Totals:										102,827 Gal	28.17	517,370 Gal	620,197 Gal	169.9 Gal			
From Utility Bills:													621,356 Gal	170.2 Gal			
Fire & Police Consumption:													614,250				
Port Security & CS Consumption:													7,106				
Estimated:																	
Fire & Police Consumption:													613,087 Gal				
Port Security & CS Consumption:													7,110 Gal				

5.0 BUILDING SYSTEMS

5.1 ENVELOPE

The following table shows the building envelope components that were observed at the Property.

Building Component	Fire Station	Police Station	Island Tours Building	Port Security Offices
Year Built	1911	1988	1900	2012
Living Area (Sq. Ft.)	7,800	2,305	475	2,242
Foundation	Slab-on-grade	Slab-on-grade	Slab-on-grade	Slab-on-grade
Framing	Wood	Wood	Masonry	Steel
Exterior Cladding	Unpainted brick	Unpainted brick	Unpainted brick	Vinyl Siding
Roof	Flat with Rubber Membrane	Flat with Rubber Membrane	Gable/Hip with Asphalt Shingles	Gable/Hip with Asphalt Shingles
Windows	Double Pane Vinyl Frame	Double Pane Vinyl Frame	Double Pane Vinyl Frame	Double Pane Vinyl Frame
Exterior Doors	Double Pane	Double Pane	Double Pane	Double Pane

5.2 LIGHTING

The following tables provide an inventory of observed lighting fixtures, lamp type, and wattage.

Lighting Audit (Common Area)

Area of Building	Existing Fixture	Total # Fixtures	Lamps Per Fixture	Total # of Lamps	LED Equivalent Wattage	Current kWh Usage	kWh Usage w/ LED	kWh Saved Per Year	Cost Per kWh	Current Annual Op Cost	Annual Cost Using LEDs	Savings	Cost to Install Lighting	Pay back
Basement	2B 40W 4' T12 Electronic	6	2	12	17	1,485	631	854	\$0.15	\$221	\$94	\$127	\$223	1.75555
Interior	1B 8W LED	127	1	127	0	3,144	3,144	0	\$0.15	\$469	\$0	\$0	\$0	-
Interior	1B 32W 4' T8	2	1	2	11	198	68	130	\$0.15	\$30	\$10	\$19	\$17	0.89012
Interior	2B 32W 4' T8	23	2	46	11	4,554	1,566	2,989	\$0.15	\$679	\$233	\$445	\$397	0.89012
Interior	1B 9W LED	6	1	6	0	473	473	0	\$0.15	\$71	\$0	\$0	\$0	-
Interior	3B 32W 4' T8	11	3	33	11	5,398	1,856	3,543	\$0.15	\$805	\$277	\$528	\$284	0.53874
Exterior	1B 60W Incandescent	0	0	0	0	808	121	686	\$0.15	\$120.37	\$18.06	\$102.31	\$17	0.17
Exterior	1B 9W LED	0	0	0	0	61	61	0	\$0.15	\$9.03	\$9.03	\$0.00	\$0	-
						16,120	7,919	8,202		\$2,403	\$641	\$1,222	\$939	0.8

Exterior Lighting Audit

Area of Building	Existing Fixture	Total # Fixtures	Lamps Per Fixture	Total # of Lamps	LED Equivalent Wattage	Current kWh Usage	kWh Usage w/ LED	kWh Saved Per Year	Cost Per kWh	Current Annual Op Cost	Annual Cost Using LEDs	Savings	Cost to Install Bi-Level Fixtures	Pay back
Exterior	1B 75W LED	2	1	2	75	1,010	454	555	\$0.15	\$150	\$68	\$83	\$186	2.25
Exterior	1B 14W LED	6	1	6	14	565	254	311	\$0.15	\$84	\$38	\$46	\$186	4.02
Exterior	1B 14W LED	4	1	4	14	377	170	207	\$0.15	\$56	\$25	\$31	\$124	4.02
						1,952	878	1,073		\$ 291	\$ 131	\$ 160	\$ 497	3.10

Lighting Photographs



Fire Station Interior



Interior Building Shell



Port Security Interior Lighting



Port Security Interior Lighting

5.3 BUILDING MECHANICAL SYSTEMS

The Fire and Police Station buildings utilize distinct heating systems. The Fire Station is served by a 534 MBH steam boiler, installed in 2024 and rated at 82% efficiency. The Police Station is heated by a 151 MBH hot water boiler, originally rated at 87% efficiency. Both boilers operate on Fuel Oil #2 and supply steam and hot water to radiators and unit heaters throughout the facilities. Supplemental heating and cooling are provided by three mini-split heat pump systems and five wall-mounted PTAC units.

The Port Security building, renovated two years ago, is served by a high-efficiency mini-split heat pump system that provides both heating and cooling.

Additionally, the Fire Station houses a 7.5 HP air compressor, which is used for the fire whistle, garage door operation, and tire inflation.

Electric storage water heaters provide domestic hot water (DHW) in each building. The Police Station and Fire Station share a 40-gallon electric storage water heater. The Port Security building is served by a separate 40-gallon electric storage water heater. The Pier Comfort Station utilizes a 4-gallon mini-tank electric storage water heater.

Building Mechanical System Photographs



Radiator



Fire Station PTAC Unit



Fire Station Radiator



Fire Station Ceiling Fan



Police Station Boiler



Domestic Water Heater



Fire Station Boiler



Interior Mini-Split HVAC Unit



PTAC Unit



Port Security Electric Storage Domestic Water Heater



Port Security Digital Thermostat



Port Security Interior Mini-Split HVAC Unit

5.4 APPLIANCES

The Police and Fire Station contain a propane oven and stove with exhaust fan, four refrigerators, and a dish washing machine.

The following table provides the details of the typical appliances observed in the spaces.

Appliance Photographs



Propane Stove



Kitchen Hood



Dishwasher



Refrigerator



Mini-fridge

5.5 LAUNDRY EQUIPMENT

The Police and Fire Station contain a residential style clothes washing machine, one residential clothes dryer, and a commercial clothes washing machine.

The following table provides the details of the typical laundry equipment observed in the spaces.

Laundry Equipment Photographs



Residential Laundry Machines



Mini-fridge



Commercial Washing Machine

Building	Location or Unit Address	Equipment Description	Manufacturer	Model #	Serial #	YEAR of Manufacture	EUL	RUL	Quantity	Heating Fuel	Heating Output Capacity	Heating Efficiency (AFUE, TE, COP, HSPF)	Efficiency Unit of Measure	Cooling Type	Cooling Capacity (Tons)	Efficiency (SEER, EER, Etc.)	Efficiency Unit of Measure
Public Safety	37 Firefly Ln	Air Compressor	Ingersoll Rand	2545E7 5-FP 200/3	403300038		15	0	1								
Public Safety	37 Firefly Ln	Hot Water Boiler	Weil-McLain	P-468V-WT		1996	25	-4	1	#2 Fuel Oil	131,000	87%	TE				
Public Safety	37 Firefly Ln	Steam Boiler	Burnham Commercial	V905		2024	25	24	1	#2 Fuel Oil	534,000	82.4%	TE				
Public Safety	37 Firefly Ln	Hot Water Unit Heater	Modine	HS 1085	05011797-8361		20	0	1								
Public Safety	37 Firefly Ln	Hydronic Radiant Heater	Trane	RE46A003	S88H 64509	1988	25	-12	1								
Public Safety	37 Firefly Ln	Air Conditioner	Perfect Aire - Illinois	5PAC5000		2020	10	5	1					DX	0.42	11	CEER
Public Safety	37 Firefly Ln	Air Conditioner	Perfect Aire - Illinois	5PAC6000		2020	10	5	1					DX	0.50	12.1	CEER
Public Safety	37 Firefly Ln	Air Conditioner	Perfect Aire - Illinois	5PAC6000		2020	10	5	1					DX	0.50	12.1	CEER
Public Safety	37 Firefly Ln	Air Conditioner	Haler	HWF05XCL-L	AD8HPEEDL19A0C1		10	0	1					DX	0.42	11	CEER
Public Safety	37 Firefly Ln	Air Conditioner	GD Midea Air-Conditioning Equipment Co., Ltd.	MWFKU-08CJWH-8CJ9	2405369880182210000000	2018	10	3	1					DX	0.67	10.9	CEER
Public Safety	37 Firefly Ln	Heat Pump	Mitsubishi Electric Trane HVAC	NAXSPH12B112AA	12C0082831U085	2020	15	10	1	Electricity	21,000	4.24	COP	DX	1	13.8	EER
Public Safety	37 Firefly Ln	Heat Pump	Mitsubishi Electric Trane HVAC	NAXWPH24A132AA	1YPO05165TJ6A	2020	15	10	1	Electricity	25,000	10	HSPF	DX	2	13.8	EER
Public Safety	37 Firefly Ln	Heat Pump	Daikin Industries, Ltd.	RXS12LVJU	E032580	2020	15	10	1					DX	1	12.8	EER
Public Safety	37 Firefly Ln	Heat Pump	Daikin Industries, Ltd.	3MXL24RMVJUA		2020	15	10	1	Electricity	29,100	4.56	COP	DX	2	12.7	EER
Public Safety	37 Firefly Ln	Heat Pump	Mitsubishi Electric Trane HVAC	NAXWPH12B112AA	1001862720U91F	2020	15	10	1	Electricity	21,000	4.24	COP	DX	1	26.3	SEER2
Public Safety	37 Firefly Ln	Heat Pump	Mitsubishi Electric Trane HVAC	NAXWPH068112AA	100112720U91H	2020	15	10	1	Electricity	14,000	4.68	COP	DX	0.5	32.2	SEER2
Public Safety	37 Firefly Ln	Heat Pump	Mitsubishi Electric Trane HVAC	NAXWPH12B112AA	1001531720U91F	2020	15	10	1	Electricity	21,000	4.24	COP	DX	1	26.3	SEER2
Public Safety	37 Firefly Ln	Heat Pump	Mitsubishi Electric Trane HVAC	NAXWPH068112AA	1001129720U91H	2020	15	10	1	Electricity	14,000	4.68	COP	DX	0.5	32.2	SEER2
Public Safety	37 Firefly Ln	Heat Pump	Daikin Industries, Ltd.	FTXS12LVJU	E275230	2022	15	12	1	Electricity	14,400	4.35	COP	DX	1	12.8	EER
Port Security	23 Ells Pier	Heat Pump	Daikin Industries, Ltd.	FXLQ12MVJU	A020481	2020	15	10	1	Electricity	13,500	4.35	COP	DX	1	13.8	EER
Port Security	23 Ells Pier	Heat Pump	Daikin Industries, Ltd.	FXLQ12MVJU	A020480	2020	15	10	4	Electricity	13,500	4.35	COP	DX	1	13.8	EER
Port Security	23 Ells Pier	Heat Pump	Daikin Industries, Ltd.	FXAQ18PVJU	E000507	2022	15	12	2	Electricity	20,000	4.35	COP	DX	1.5	13.8	EER
Pier Comfort Station	21 Ells Pier	Electric wall heater	Marley	WH4404		2013	15	3	1	Electricity	3,000	1	COP				

0.149045662

Domestic Water Heating

Building	Location or Unit Address	Manufacturer	Model #	Serial #	YEAR of Manufacture	EUL	RUL	Quantity	Fuel	Input Capacity	Input Units of Measure	Storage Capacity (Gal)	Efficiency (Uniform Energy Factor)	kWh/year
Public Safety	37 Firefly Ln	Bradford White Corporation	RE34056-1NCWW	AF33579541	2024	10	10	1	Electric resistance	4.5	kW	36	0.91	2,464
Port Security	23 Ells Pier	BRADFORD WHITE CORPORATION	LD40.33C090	JH17052030	2021	10	-21	1	Electric resistance	4.5	kW	40	0.91	
Pier Comfort Station	21 Ells Pier	Bosch	ES 4-1M WIR	370 918 0032827738004997				0						

Refrigerators

Building	Location	Manufacturer	Model	Serial #	YEAR of Manufacture	EUL	RUL	Quantity	Cubic Foot Capacities	Freezer Location	Ice Maker?	Door Seal Condition	Annual Usage (kWh)	Energy Star?
Public Safety	37 Firefly Ln	GE	GTE22J5NBSS	H5782325	2009	10	-5	1	21.9				405	FALSE
Public Safety	37 Firefly Ln	Amana	ART318FFDW06	V594071267		10	0	1	18.2				411	
Public Safety	37 Firefly Ln	Amana	A512575GRS08	HRC1554340	2023	10	8	1	24.5-26.4				702	
Public Safety	37 Firefly Ln	Danby			2020	10	5	1	4				333	
Port Security	23 Ells Pier	Vissani			2020	10	5	1	6				450	

Dishwashers

Number	Location	Manufacturer	Model #	Serial #	YEAR of Manufacture	EUL	RUL	Quantity	Annual Usage (gal/cycle)	Energy Star?
1	Kitchen	Bosch	SH6M63W56N			7	0	1	3.5	

Laundry Equipment

Number	Location	Appliance Type	Manufacturer	Typical Model #	Typical Serial #	YEAR of Manufacture	EUL	RUL	Quantity	Annual Usage (kWh, gal/cycle, etc.)	Energy Star?
1	Public Safety	Washing Machine	Alliance	AWN4325P113TW01	1507018522		10				
2	Public Safety	Clothes Dryer	Alliance	LEA30AW	5 9808154826	1998	10				
3	Public Safety	Washing Machine	Pellerin Milnor Corporation	MWR16X5	150116767	2018	10		1		

6.0 RECOMMENDED EWEMS

The Recommended EWEMs table found earlier in this report identifies the measures that should be considered for further evaluation or implementation. This section describes each Recommended EWEM in further detail.

6.1 EWEMs

AEI has identified (8) EWEMs for this Property.

EWEM #1 - REPLACE EXISTING FUEL OIL #2 BOILER SERVING THE POLICE STATION WITH A CONDENSING PROPANE BOILER

Existing Condition:

The existing boiler is beyond the end of its expected useful life. It was originally rated at 87% efficient.

This measure recommends replacing the existing fuel oil #2 boiler serving the Police Station with a high-efficiency condensing propane boiler.

Condensing propane boilers offer significantly higher thermal efficiencies than standard efficiency units by recovering latent heat from the flue gases, which results in substantial fuel savings.

Incremental Cost Analysis:

A replacement is necessary since the existing fuel oil unit heaters are at or beyond their expected useful life. Therefore, the payback period for this measure should be calculated based on the incremental cost of installing the high-efficiency condensing propane unit heater versus replacing the existing units with standard-efficiency fuel oil heaters.

- **Estimated Cost of Condensing Propane Unit Heater:** \$12,006
- **Estimated Cost of Standard Efficiency Fuel Oil Boiler:** \$10,606

Incremental Cost: \$1,400

Estimated Annual Savings: \$320

Simple Payback Period (based on incremental cost): 4.4 years

Benefits:

- **Significant Energy Savings:** Reduced fuel consumption due to higher thermal efficiency of condensing propane.
- **Reduced Operating Costs:** Lower fuel bills due to reduced energy consumption.
- **Environmental Benefits:** Reduced greenhouse gas emissions compared to fuel oil combustion.

Estimated Annual Operational & Maintenance (O&M) Savings: None expected.

Operational Changes for Staff: None required.

Implementation Impact to Occupants: The installation will require coordination between the facility management and the contractor to minimize heating downtime in the Fire Station. It is recommended that the installation be scheduled during off-peak usage periods.

Available Rebates or Incentives:

- Based on the 2025 Commercial Heating, Ventilation, and Air Conditioning (HVAC) Solutions from Efficiency Maine, this project could qualify for rebates on the propane unit heater itself, as well as potential boiler control and ancillary equipment rebates.
 - Efficiency Maine offers incentives for Commercial Boilers, Furnaces, and Commercial Boiler Controls and Ancillary Equipment (retrofit only).
- It is advised to review the Program Opportunity Notice (guidelines and project application) found on the Efficiency Maine website.
- It is highly recommended that you work with an Efficiency Maine Qualified Partner to maximize potential incentives.

More information about available incentives and funding opportunities can be found in Section 8.1 State Level Incentives .

EWEM #2 - REPLACE EXISTING FUEL OIL #2 BOILER SERVING THE FIRE STATION WITH A CONDENSING PROPANE BOILER

Existing Condition:

The existing boiler is standard efficiency and rated at 82% efficient. The boiler was installed in 2024.

This measure recommends replacing the existing fuel oil #2 boiler serving the Fire Station with a high-efficiency condensing propane boiler.

Condensing propane boilers offer significantly higher thermal efficiencies than standard efficiency units by recovering latent heat from the flue gases, which results in substantial fuel savings.

Estimated Annual Savings: \$678

Simple Payback Period (based on incremental cost): 35.7 years

Benefits:

- **Significant Energy Savings:** Reduced fuel consumption due to higher thermal efficiency of condensing propane.
- **Reduced Operating Costs:** Lower fuel bills due to reduced energy consumption.

- **Environmental Benefits:** Reduced greenhouse gas emissions compared to fuel oil combustion.

Total Estimated Cost (including labor and materials): \$24,218

Estimated Annual Operational & Maintenance (O&M) Savings: None expected.

Operational Changes for Staff: None required.

Implementation Impact to Occupants: The installation will require coordination between the facility management and the contractor to minimize heating downtime in the Fire Station. It is recommended that the installation be scheduled during off-peak usage periods.

Available Rebates or Incentives:

- Based on the 2025 Commercial Heating, Ventilation, and Air Conditioning (HVAC) Solutions from Efficiency Maine, this project could qualify for rebates on the propane unit heater itself, as well as potential boiler control and ancillary equipment rebates.
 - Efficiency Maine offers incentives for Commercial Boilers, Furnaces, and Commercial Boiler Controls and Ancillary Equipment (retrofit only).
- It is advised to review the Program Opportunity Notice (guidelines and project application) found on the Efficiency Maine website.
- It is highly recommended that you work with an Efficiency Maine Qualified Partner to maximize potential incentives.

More information about available incentives and funding opportunities can be found in Section 8.1 State Level Incentives .

EWEM #3 - RETROFIT INTERIOR LIGHTING WITH ENERGY STAR CERTIFIED LEDs

This measure recommends retrofitting 44 existing common area light fixtures containing 95 linear fluorescent tube lamps with new Energy Star-certified LED fixtures or lamps. The current fluorescent lighting system exhibits inefficient energy consumption and can be significantly improved by transitioning to modern LED technology.

LED lighting offers a significantly higher lumen-per-watt ratio than traditional fluorescent lighting. LED fixtures consume considerably less energy for the same light output, which results in substantial energy savings. Additionally, LED lamps have a significantly longer lifespan, reducing the frequency of replacements and associated maintenance costs.

The retrofit should prioritize Energy Star-certified LED products to ensure optimal energy efficiency and product quality. The selection of LED fixtures or lamps should be based on the existing fixture types and the desired light output, color temperature, and distribution to maintain or improve the existing lighting quality.

Benefits:

- **Significant Energy Savings:** Reduced electricity consumption due to the higher lumen-per-watt efficiency of LEDs.
- **Reduced Operating Costs:** Maintenance costs will be reduced due to the longer LED lifespans, leading to less frequent replacement intervals.
- **Improved Lighting Quality:** Consistent light output, improved color rendering, and reduced flicker.
- **Extended Lifespan:** LEDs offer a significantly longer lifespan than fluorescent lamps, minimizing replacement frequency.
- **Reduced Environmental Impact:** Lower energy consumption translates to reduced greenhouse gas emissions.

Total Estimated Cost (including labor and materials): \$938

Estimated Annual Savings: \$1,222

Estimated Annual Operational & Maintenance (O&M) Savings: The extended lifespan of LED lamps will significantly reduce replacement and maintenance costs over time.

Operational Changes for Staff: None required.

Implementation Impact to Occupants: The retrofit will occur in common areas and on-site during regular business hours. Minimal disruption to occupants is expected.

Available Rebates or Incentives:

- Efficiency Maine offers the 2025 Discounted Screw-In LEDs Program. This program provides discounted screw-in LEDs at retailers and distributors across the state. While this program focuses on screw-in bulbs, it is worth investigating whether any common area fixtures can utilize these discounted bulbs.
- Efficiency Maine offers the 2025 Commercial and Industrial (C&I) Custom Program - Electric Projects. This program is for electrical energy efficiency projects that result in at least 36,000 kWh of annual reductions in grid-supplied energy. If the total project savings meet the minimum requirements, this project may qualify for custom incentives. Performing a detailed energy savings calculation to determine eligibility is highly recommended.
- This project may also qualify for the 2025 Commercial and Industrial (C&I) Custom Program - Electric Projects because this program funds electrical energy efficiency projects.
- It is advised to review the Program Opportunity Notice (guidelines and project application) found on the Efficiency Maine website.

More information about available incentives and funding opportunities can be found in Section 8.1 State Level Incentives .

EWEM #4 - RETROFIT EXTERIOR LIGHTING WITH ENERGY STAR CERTIFIED LEDs

This measure recommends retrofitting 12 existing exterior light fixtures with new Energy Star certified bi-level LED fixtures or lamps. Bi-level, occupancy controlled fixtures will dim the exterior lights to 50% when no motion is detected, and raise the brightness to 100% when occupancy is detected.

The retrofit should prioritize Energy Star certified LED products designed for outdoor applications to ensure optimal energy efficiency, weather resistance, and product quality. The selection of LED fixtures or lamps should be based on the existing fixture types, the desired light output, color temperature, and distribution to maintain or improve the existing lighting quality, while also considering safety and security requirements.

Benefits:

- **Significant Energy Savings:** Reduced electricity consumption due to higher lumen-per-watt efficiency of LEDs.
- **Reduced Operating Costs:** Lower energy bills and reduced maintenance costs due to longer LED lifespan.
- **Improved Lighting Quality:** Consistent light output, improved color rendering, and reduced light pollution.
- **Extended Lifespan:** LEDs offer a significantly longer lifespan than traditional exterior lighting, minimizing replacement frequency.
- **Enhanced Safety and Security:** Improved light distribution and color rendering can enhance visibility and security.
- **Reduced Environmental Impact:** Lower energy consumption translates into reduced greenhouse gas emissions.

Total Estimated Cost (including labor and materials): \$497

Estimated Annual Savings: \$160

Estimated Annual Operational & Maintenance (O&M) Savings: The extended lifespan of LED lamps will significantly reduce replacement and maintenance costs over time, especially for exterior fixtures that may be difficult to access.

Operational Changes for Staff: None required.

Implementation Impact to Occupants: The retrofit will occur during normal business hours in exterior areas. Minimal disruption to occupants is expected.

Available Rebates or Incentives:

- Efficiency Maine offers the 2025 Discounted Screw-In LEDs Program. This program offers discounted screw-in LEDs at retailers and distributors across the state. While this program focuses on screw-in bulbs, it is worth investigating if any of the exterior fixtures can utilize these discounted bulbs.

- Efficiency Maine offers the 2025 Commercial and Industrial (C&I) Custom Program - Electric Projects. This program is for electrical energy efficiency projects that result in at least 36,000 kWh of annual reductions in grid-supplied energy. If the total project savings meet the minimum requirements, this project may qualify for custom incentives. It is highly recommended that a detailed energy savings calculation be performed to determine eligibility.
- This project may also qualify for the 2025 Commercial and Industrial (C&I) Custom Program - Electric Projects because this program funds electrical energy efficiency projects.
- It is advised to review the Program Opportunity Notice (guidelines and project application) found on the Efficiency Maine website.

More information about available incentives and funding opportunities can be found in Section 8.1 State Level Incentives .

EWEM #5 - REPLACE THE EXISTING ELECTRIC TANK DOMESTIC WATER HEATER WITH A NEW HEAT PUMP WATER HEATER

Description:

This measure recommends replacing the existing indirect-fired domestic water heater with a new, high-efficiency heat pump water heater (HPWH) with a minimum Uniform Energy Factor (UEF) of 3.75. While utilizing boiler heat, the current indirect-fired water heater can be significantly improved by transitioning to a dedicated HPWH, which offers superior energy efficiency and reduced operational costs.

Heat pump water heaters extract heat from the surrounding air and transfer it to the water rather than directly heating it with electric resistance or fossil fuels. This process produces significantly higher energy efficiency than traditional water heaters, leading to substantial energy savings. The UEF rating of 3.75 indicates a highly efficient unit, ensuring optimal performance and reduced energy consumption.

The new HPWH should be sized appropriately to meet the building's hot water demand. A professional plumbing contractor should perform a load calculation to determine the correct capacity and ensure adequate hot water supply.

Benefits:

- **Significant Energy Savings:** Reduced electricity consumption due to the high efficiency of heat pump technology.
- **Reduced Operating Costs:** Lower energy bills due to reduced energy consumption.
- **Environmental Benefits:** Reduced greenhouse gas emissions compared to traditional water heaters.
- **Improved Efficiency:** A UEF rating of 3.75 indicates a highly efficient unit.

Total Estimated Cost (including labor and materials): \$3,129

Estimated Annual Savings: \$2,172

Estimated Annual Operational & Maintenance (O&M) Savings: None.

Operational Changes for Staff: None required.

Implementation Impact to Occupants: The installation will require coordination between the facility management and the contractor to minimize downtime of domestic hot water service. To reduce disruption, it is recommended to schedule the installation during off-peak hot water demand periods.

Available Rebates or Incentives:

- **Federal Tax Credit:** This project qualifies for a federal tax credit of 30% of the project cost, up to a maximum credit of \$2,000. It is recommended to consult with a tax professional to ensure eligibility and proper documentation.
- Based on the 2025 Water Heating Solutions from Efficiency Maine, this project could qualify for rebates on the heat pump water heater and potential ECM circulator pump rebates if the installation requires a new circulator pump.
 - Efficiency Maine offers incentives for both Light and Heavy Duty Commercial Heat Pump Water Heaters.
 - Depending on its size, the new water heater will fall into one of those categories, and the respective incentives are listed in the provided information.
 - Efficiency Maine also offers incentives on ECM circulator pumps.
- It is advised to review the Program Opportunity Notice (guidelines and project application) found on the Efficiency Maine website.
- Working with an Efficiency Maine Qualified Partner is highly recommended to maximize any potential incentives.

More information about available incentives and funding opportunities can be found in Section 8.1 State Level Incentives .

EWEM #6 - NEW HOT WATER HEATER PIPE INSULATION

The hot water water piping in the basement of the Police Station is currently uninsulated which causes heat loss to the surrounding environment. Insulating the piping will extend the cooling-down period, reducing loads on cooling equipment. It will also allow the piping to heat up more quickly during periods of use. Recommend adding add R-5.4 insulation to 100 linear feet of 1 inch diameter domestic hot water piping including flexible connectors, tees, and valves.

Total estimated cost including labor and material: \$768

Estimated Annual Savings: \$214

Estimated O&M savings: None

Operational changes of staff required to support the measure: None

Available rebates or incentives for this measure: More information about available incentives and funding opportunities can be found in Section 8.1 State Level Incentives .

Implementation impact to occupants: None

EWEM #7 - NEW WATERSENSE LOW FLOW KITCHEN FAUCET AERATOR

The existing kitchen faucet aerator has a flow rate of 2.0 GPM. Recommend replacing one (1) existing kitchen faucet aerator with new WaterSense labeled 1.5 GPM aerators. Aerator housings must bear a 1.5 GPM manufacturer flow rating. With new lower flow aerators, less water will be consumed as well as less energy required for hot water.

Total estimated cost including labor and material: \$17

Estimated Annual Savings: \$182

Estimated O&M savings: None

Operational changes of staff required to support the measure: None

Available rebates or incentives for this measure: More information about available incentives and funding opportunities can be found in Section 8.1 State Level Incentives .

Implementation impact to occupants: Minimal; Installation should take less than 5 minutes per faucet.

EWEM #8 - NEW WATERSENSE LOW FLOW SHOWERHEADS

The existing showerhead in the Fire Station has a rated flow rate of 2.5 GPM. Recommend replacing one (1) existing showerheads with new WaterSense labeled 1.5 GPM shower heads. Showerhead housings must bear a 1.5 GPM manufacturer flow rating. With new lower flow showerhead, less water will be consumed as well as less energy required for hot water.

Total estimated cost including labor and material: \$18.75

Estimated Annual Savings: \$746

Estimated O&M savings: None

Operational changes of staff required to support the measure: None

Available rebates or incentives for this measure: More information about available incentives and funding opportunities can be found in Section 8.1 State Level Incentives .

Implementation impact to occupants: Minimal; Installation should take less than 5 minutes per showerhead.

EWEM #9 - NEW WATERSENSE LOW FLOW BATHROOM FAUCET AERATOR

The existing bathroom faucet aerators in the Police and Fire Station have flow rates of 1.5 GPM and the existing bathroom faucet aerator in the Port Security Office building is 2.2 GPM. Recommend replacing six (6) existing bathroom faucet aerator with new WaterSense labeled 0.5 GPM aerators. Aerator housings must bear a 0.5 GPM manufacturer flow rating. With new lower flow aerators, less water will be consumed as well as less energy required for hot water.

Total estimated cost including labor and material: \$17

Estimated Annual Savings: \$404

Estimated O&M savings: None

Operational changes of staff required to support the measure: None

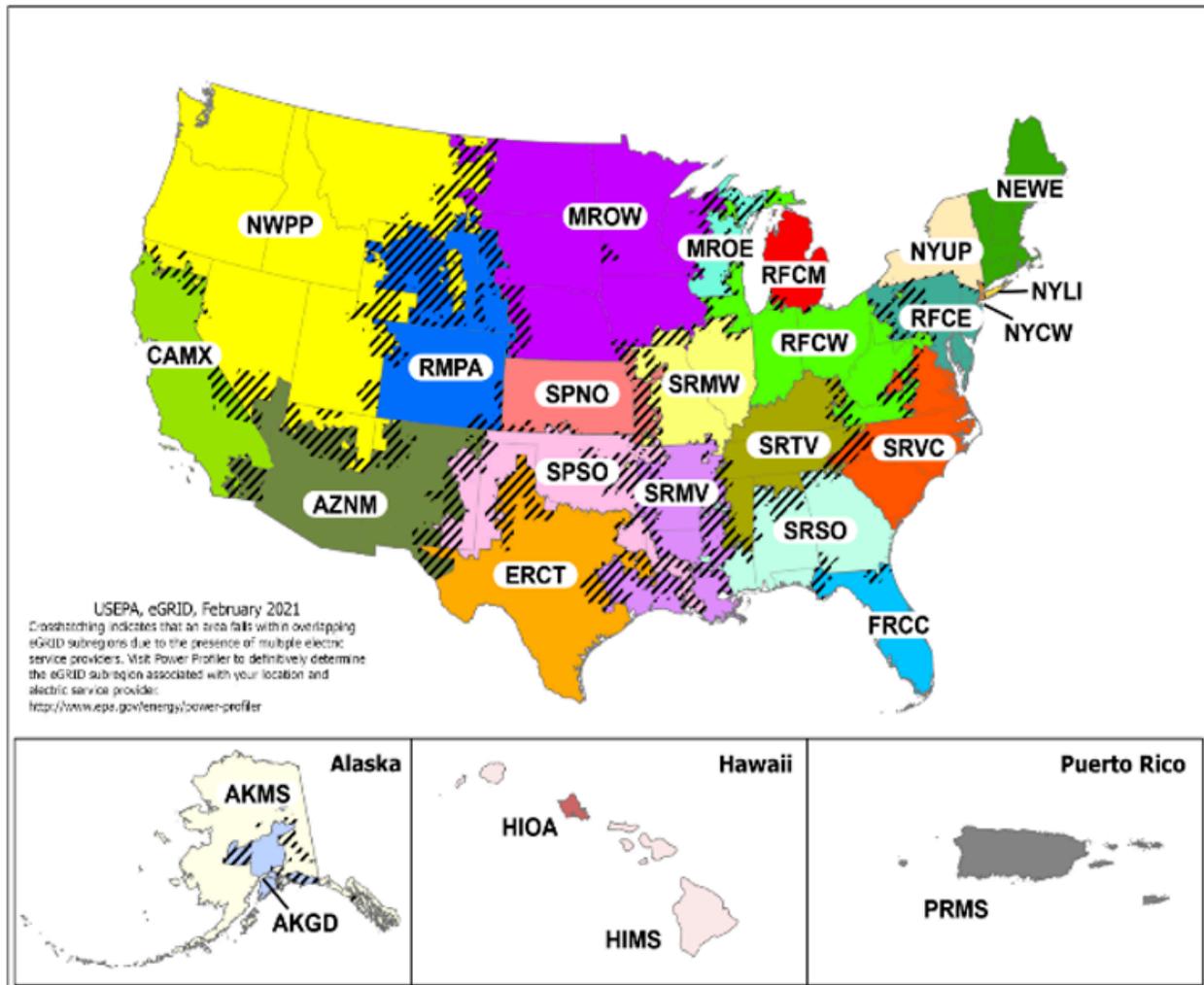
Available rebates or incentives for this measure: More information about available incentives and funding opportunities can be found in Section 8.1 State Level Incentives .

Implementation impact to occupants: Minimal; Installation should take less than 5 minutes per faucet.

7.0 GHG EMISSIONS ANALYSIS

7.1 EGRID SUBREGIONS

A map of the the eGRID subregions and the equivalent CO₂ emissions factor used in the GHG emissions analysis calculations are shown below.

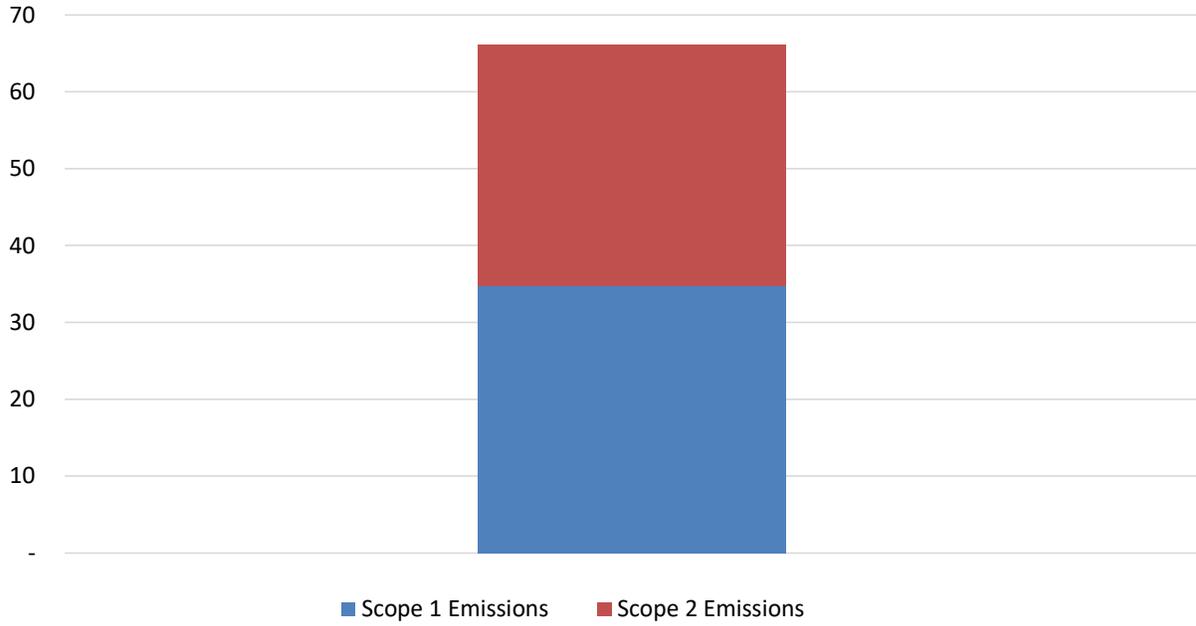


eGRID Subregion Name	eGRID Acronym	CO ₂ e Emissions Factor (lb/MWh)
NPCC New England	NEWE	540.48
National Average	N/A	775.2

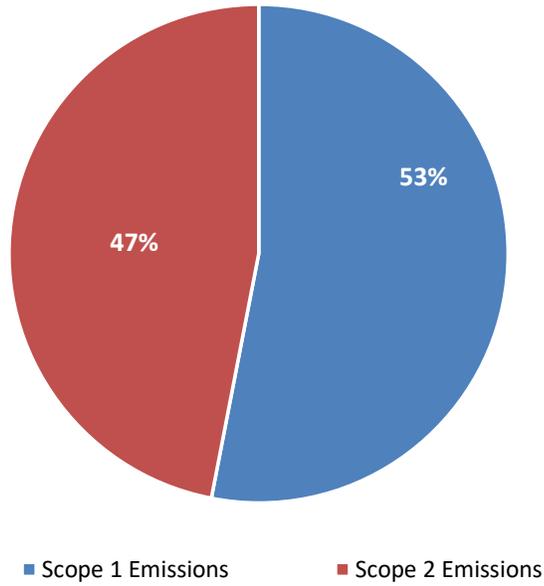
7.2 BASELINE SCOPE 1 AND SCOPE 2 GHG EMISSIONS

The following charts show the existing Scope 1 and Scope 2 emissions calculated for the Property using the above equivalent CO₂ emissions factor for the applicable region.

Baseline Scope 1 and Scope 2 Emissions (MTCO₂e/yr)



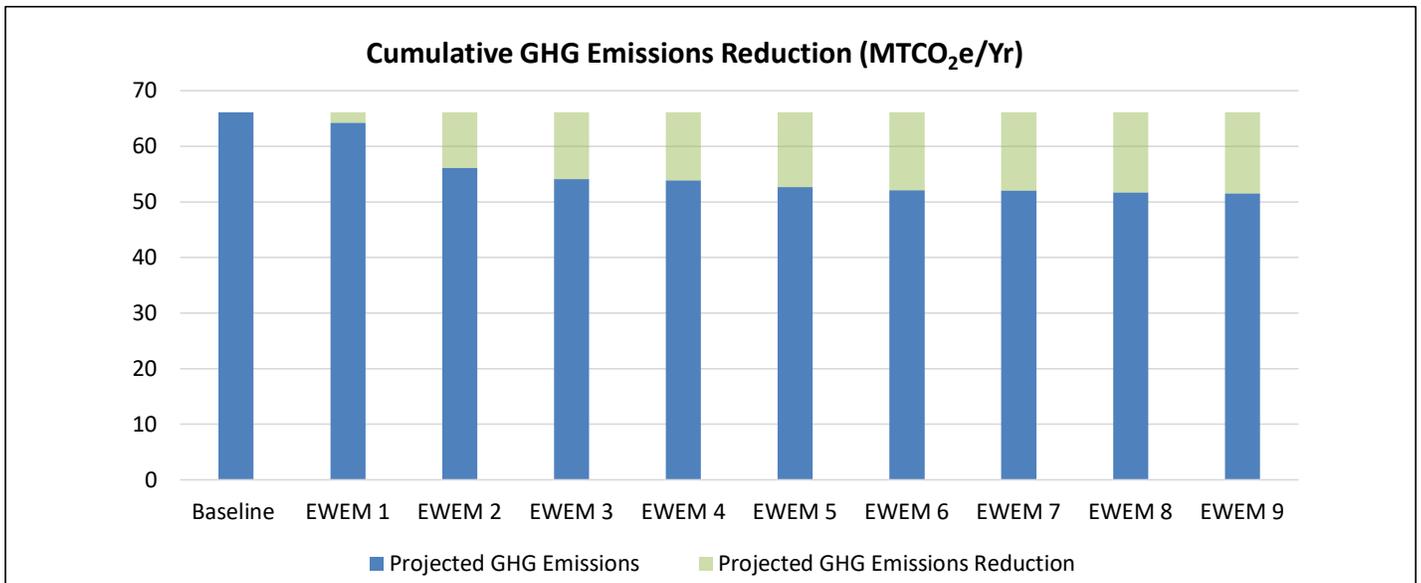
Baseline Scope 1 and Scope 2 Emissions (%)



7.3 GHG EMISSIONS REDUCTION PER EWEM

The following table and chart show the equivalent CO₂ emissions reduction per EWEM and the cumulative reduction of the combined EWEMs. The cumulative reduction chart assumes each EWEM will be implemented.

EWEM #	Energy And Water Efficiency Measures (EWEM) Summary Description	Projected GHG Emissions (MTCO ₂ e)	Emissions Reduction (MTCO ₂ e)	Emissions Reduction (%)
Baseline	Current GHG emissions	66.09		
EWEM 1	Replace the existing 82% efficient Fuel Oil #2 Boiler in the Police Station with a new 98% efficient Propane-fired boiler.	66.09	1.85	2.8%
EWEM 2	Replace the existing 75% efficient Fuel Oil #2 Boiler in the Fire Station with a new 96% efficient Propane-fired boiler.		8.13	12.3%
EWEM 3	Retrofit Interior Lighting Fixtures with DLC Certified LED Lamps.		2.01	3.0%
EWEM 4	Replace Exterior Lighting Fixtures with Bi-Level Linear LED Lighting Fixtures.		0.26	0.4%
EWEM 5	Replace 1 Existing Electric Water Heater with 1 Hybrid Heat Pump Water Heater (HPWH) with a minimum UEF of 4.		1.13	1.7%
EWEM 6	Add R-5.4 insulation to 100 LF of 1 inch diameter domestic hot water piping, including flexible connectors, tees, and valves. ARMAFLEX 3/4 - inch wall thickness or equivalent insulation values		0.62	0.9%
EWEM 7	Replace 1 Existing Kitchen Faucet Aerators With 1.5 GPM Low Flow Aerators. Aerator housings must bear 1.5 GPM manufacturer flow ratings. *The savings and payback shown for this measure assume that EWEMs #1 & #2 have been implemented.		0.07	0.1%
EWEM 8	Replace 1 Existing Higher Flow Showerheads With 1.5 GPM WaterSense Labeled Showerheads. Showerheads must bear the manufacturer flow ratings. *The savings and payback shown for this measure assume that EWEMs #1 & #2 have been implemented.		0.31	0.5%
EWEM 9	Replace 6 Existing Bathroom Faucet Aerators With 0.5 GPM WaterSense Labeled Low Flow Aerators. Aerator housings must bear 0.5 GPM manufacturer flow ratings. *The savings and payback period shown for this measure assume that EWEM #5 has been implemented.		0.16	0.2%
Total	Projected GHG emissions and reduction from baseline	51.55	14.54	0.22



8.0 FINANCIAL INCENTIVES

The following section will identify available incentives across the country and how they may or may not apply to the property and the recommendations made in this report. AEI will provide a summary of available energy efficiency incentives. The best resource to stay current on active energy efficiency incentives is at: dsireusa.org.

8.1 STATE LEVEL INCENTIVES

2025 Technical Assistance

(Existing Buildings)

Administrator: Efficiency Maine

Apply Services

IncentiFind can connect you to our expert who can explain why this incentive may be right for your project.

Description

Efficiency Maine offers incentives for Technical Assistance Studies to those customers that have already identified a project but need additional outside assistance to move it forward. Customers are guided through the process of developing the energy savings analyses and project cost estimates necessary for our Custom Program application. Efficiency Maine may provide up to 50% of the cost of an approved Technical Assistance Study up to \$20,000.

Eligible Scope

Efficiency Maine's Commercial and Industrial (C&I) Custom Program provides funding for Technical Assistance (TA) Studies to help program participants lay the necessary groundwork for project investment. The Program incentive is 50% of the approved TA Study cost up to \$25,000. Eligible TA Studies include investment-grade analysis of large and more complex projects, as well as development of systems designs and preparation of construction bid documents for targeted measures. Additionally, Efficiency Maine will support interconnection applications and studies required for battery projects that are applying for an incentive through the Energy Storage System (ESS) Program Opportunity Notice

Funded TA Studies must focus on complex projects that require engineering to proceed, and that are found likely to be eligible for Custom Program or ESS Program funding. All award decisions will be made by Efficiency Maine based on a review of potential project eligibility, alignment with Program goals, and a preliminary cost effectiveness screening. Examples of potentially eligible studies include: custom process improvement upgrades, large or complex beneficial electrification or HVAC projects, and battery system designs.

C&I Custom Program Technical Assistance guidelines

Estimated Funds

Min Funds

Varies by Project.

Max Funds

- Efficiency Maine may provide 50% of the cost of an approved Technical Assistance Study up to \$25,000.
- \$200,000 is being initially allocated to this program for the remainder of the 2024 fiscal year (July 1, 2023 through June 30, 2024).

Next Steps

1. The customer and/or TA Provider provide Efficiency Maine preliminary estimates of measure costs and energy impacts in order to determine cost effectiveness. These preliminary estimates could also come from an Efficiency Maine scoping audit.
2. If cost effectiveness found positive, customer and TA Provider submit a [TA Study application](#).
3. Coordinate a TA Study kick off meeting between the customer, TA Provider, and Efficiency Maine in order to clearly define the study scope, and agreed upon deliverables.
4. The Efficiency Maine representative reviews the TA Study application package and, if applicable, recommends award of the TA incentive to the Efficiency Maine Program Manager. The Efficiency Maine representative communicates the final decision to the customer and the TA Provider.
5. The customer authorizes the TA Provider to proceed with the study. The Efficiency Maine representative remains engaged with the process to address questions and provide input, guidance, and assistance as necessary. The TA provider must inform Efficiency Maine of any changes in the TA Study scope of work as soon as they are known.
6. Once the TA Study is complete, it is submitted to Efficiency Maine for review.
7. Efficiency Maine reviews the study to confirm the agreed-upon deliverables are completed.
8. Efficiency Maine requests clarification or elaboration, if appropriate.
9. Efficiency Maine issues TA incentive award.

2025 Commercial and Industrial (C&I) Custom Program - Thermal Projects

(Existing Buildings)

Administrator: Efficiency Maine

Apply Services

IncentiFind can help you APPLY to this incentive. Our fee is 30% of the total rebate value.

Description

Maine businesses, nonprofits, institutions, and governments are eligible for funding for a variety of thermal energy efficiency projects through Efficiency Maine's Commercial and Industrial (C&I) Custom Program. Funding is available for thermal projects that involve a measure (or set of measures) that reduces the consumption of natural gas, oil, biomass, and other fuels.

Awarded projects have included heat recovery measures, boiler upgrades and controls, and HVAC controls. For a list of previously awarded custom projects, [click here](#).

Eligible Scope

Eligible Projects

- A measure (or set of such measures) at a single facility or campus that reduces inefficient energy use (or increases efficient energy use), leading to fuel savings related to producing thermal energy for end uses such as heating, steam production and hot water.
- Projects must save a minimum of 400 MMBtu annually (4,000 therms of piped natural gas).

Ineligible Projects

- Measures that are eligible for [Efficiency Maine's C&I Prescriptive Incentive Program](#).
- Projects that have a benefit-to-cost ratio less than 1, as per Efficiency Maine's Total benefit-cost test.
- Projects that have a simple payback of under one year (after factoring in the Efficiency Maine incentive).
- Projects that involve measures required by state or federal law or local building or energy codes, or projects that are deemed by Efficiency Maine to represent standard industry practice measures.
- Projects for which the customer (or its affiliate) has made binding commitments to proceed prior to the official award of funding under the Custom Program.
- Measures that rely solely on human behavior changes or facility maintenance.
- Feasibility studies.
- Fundraising seed money for projects to be completed and funded subsequently.

Estimated Funds

Min Funds

Varies by project.

Max Funds

- Funding levels will range from a minimum of \$5,000 to a maximum of \$1,000,000 per facility up to 50% of the total project costs.
- Incentive awards are capped based on the magnitude of the validated annual reduction in grid-supplied energy (kWh/year) and/or fuel savings (MMBtu/year). Incentives will not exceed \$0.30 per kWh of validated annual reduction in grid supplied electricity plus \$25 per MMBtu of annual fuel savings.

Next Steps

1. To get started, review the [Thermal Project Application Cover Sheet](#), and [Program Opportunity Notice](#) (guidelines and project application).

2025 Lighting Solutions

Lighting can be a significant operating expense in existing buildings. Maine businesses can reduce lighting expenses by upgrading to high-efficiency fixtures and installing lighting controls. Lighting control technologies allow building managers to carefully tailor lighting conditions to the requirements of specific spaces. These upgrades can also enhance productivity and improve aesthetics. Efficiency Maine also incentivizes high-efficiency screw-in LEDs at participating distributors across Maine. [Click here](#) to learn more about the Discounted Screw-in LED Program.

Eligible Scope

Solutions

Interior LED Lighting

- LED Retrofit Kits
- New LED Fixtures
- Refrigerated Case Fixtures and Controls
- Lighting Controls

Exterior LED Lighting

- LED Retrofit Kits
- New LED Fixture

Distributor Pathway Interior Lighting

- High/Low Bay Lamps (Mogul Screw Base)
- Tubular Lamps: T-8 • T8 U-Bend • T-5 • T-5HO replacement

Distributor Pathway Exterior Lighting

- Outdoor LED Mogul Screw-Base Replacement Lamp

Estimated Funds

Min Funds

Varies by Project

Max Funds

Incentives

Interior LED Lighting

- \$0.28 per kWh of first year savings up to 65% of measure cost

Exterior LED Lighting

- \$0.28 per kWh of first year savings up to 65% of measure cost

Small Business LED Lighting

- 75% of total measure cost for qualifying interior and exterior lighting
- Small business customers must have an electric account labeled “Small General Service” (SGS), “General Service” (GS), or “Medium General Service” (MGS) with an average monthly electrical demand under 50kW
- [Click here](#) for more information on small businesses

Distributor Pathway Interior Lighting

- Incentive depends on the specific distributor
- [Click here](#) to find a participating distributor

Distributor Pathway Exterior Lighting

- Incentive depends on the specific distributor
- [Click here](#) to find a participating distributor

Next Steps

1. Work with an Efficiency Maine Qualified Partner to install high-efficiency lighting. [Click here](#) to find a Qualified Partner working near you. or If you work with a contractor that is not yet a Qualified Partner, urge your contractor to find out more information [here](#).
2. Efficiency Maine reserves the right to require pre-approval for any Program application proposing an incentive of **\$5,000 or more**.

3. As part of the project approval process, you will accept the C&I Prescriptive Program's Terms and Conditions.

2025 Water Heating Solutions

Maine businesses can reduce water heating costs by upgrading to high-efficiency water heating systems. Efficiency Maine offers incentives for heat pump water heaters and ECM circulator pumps. These upgrades can reduce water heating costs and provide hot water when needed.

Eligible Scope

Eligible Equipment

Light-Duty Commercial Heat Pump Water Heaters

- Light-duty heat pumps can be used for small commercial or residential facilities that need hot water. They typically have a tank with a storage capacity of up to 50 gallons.
- Tens of thousands of Mainers own these heat pump water heaters. They're popular because they produce lots of hot water, can save more than \$5,000 over their 10-year life, and help to dehumidify.

Heavy-Duty Commercial Heat Pump Water Heaters

- Heavy-duty commercial heat pump water heaters can provide hot water for commercial settings, including hospitals, hotels, motels, multifamily buildings, long-term care facilities, and offices.

ECM Circulator Pumps

- Businesses can reduce electric costs with the installation of ECM circulator pumps. Forced hot water ("hydronic") heating systems use circulator pumps to move heated water from boilers to radiators and back. These pumps run whenever a thermostat calls for heat. Traditional circulator pumps run at one fixed speed and use some electricity to magnetize their rotor. Electronically commutated motor (ECM) circulator pumps can modulate their speed and use permanent magnet motors that don't require any electricity to have magnetic properties. ECM circulator pumps cost less to buy and less to operate than traditional circulator pumps.
- [Click here](#) to learn more about this technology, and [click here](#) to find a participating distributor.

Estimated Funds

Min Funds

Varies by equipment type.

Max Funds

Incentives

Light-Duty Commercial Heat Pump Water Heaters

- [Click here](#) for information on incentives for light-duty heat pump water heaters.

Heavy-Duty Commercial Heat Pump Water Heaters

- See the table below for information on incentives for both retrofit and new construction projects.
- Incentives are limited to hospitals, hotels, motels, multifamily buildings, long-term care facilities, and offices.

Heat Pump Water Heater Integrated Storage || Minimum Qualifying Efficiency Criteria || Incentive Amount

- 80 gallons || ENERGY STAR® || \$1,800 per unit
- 120 gallons || ENERGY STAR® || \$3,000 per unit
- Split-system with minimum of 80 gallons || ENERGY STAR® || \$3,000 per unit

ECM Circulator Pumps

- [Click here](#) for information on incentives for ECM circulator pumps.

Next Steps

1. [Click here](#) to find a Qualified Partner working near you. If you work with a contractor that is not yet a Qualified Partner, urge your contractor to find out more information [here](#).

2025 Commercial Heating, Ventilation, and Air Conditioning (HVAC) Solutions

Businesses can save money, increase equipment reliability, and create more comfortable and productive workplaces by making energy-efficient choices when installing, renovating, or replacing HVAC equipment. By upgrading to an efficient electric HVAC system, a business can move towards beneficial electrification, or the transition of electric systems in a way that reduces overall emissions and energy costs.

Incentives for these HVAC systems are designed to encourage the installation of primary whole building heating and cooling systems. Installing electric heat pump equipment can help a business's operating systems become fossil fuel free.

[Click here](#) for more information on incentives for HVAC solutions.

Eligible Scope

Eligible Equipment

Heat Pump Solutions

- Mini-Split Heat Pumps (Air-to-Air) Heat Pump Rooftop Units (RTUs)
- Packaged Terminal Heat Pumps
- Vertical Packaged Terminal Heat Pumps
- Variable Refrigerant Flow (VRF) Systems
- Water Source Heat Pumps

Other Electric HVAC Solutions

- Demand Control Ventilation
- Electronically Commutated Motor (ECM) Circulator Pumps
- Energy Recovery Ventilator (ERV) Systems
- Variable-Frequency Drive (VFD) Systems

Propane and Natural Gas Solutions

- Biomass Boilers and Furnaces
- Commercial Boilers and Furnaces
- Commercial Boiler Controls and Ancillary Equipment (retrofit only)**

Estimated Funds

Min Funds

Varies by equipment type.

Max Funds

Heat Pump Incentives

Mini-Split Heat Pumps

- Single-zone - \$1,000
- Single-zone air source heat pumps

Small Business Mini-Split Heat Pump Retrofits

- Single-zone - \$1,400
- Single-zone air source heat pumps
- [Click here](#) for more information on eligibility.

Multifamily Mini-Split Heat Pumps

- 1 to 3 Zones: \$6.00/sq. ft.

Variable Refrigerant Flow (VRF) Systems

- \$8.00/sq. ft. single-phase without heat recovery
- \$10.00/sq. ft. without heat recovery
- \$12.00/sq. ft. with heat recovery

Heat Pump Rooftop Units (RTUs)

- 60 to <= 120 MBH: \$168 per MBH
- 121 to <= 450 MBH: \$125 per MBH

Packaged Terminal Heat Pumps

- < 7,000 Btu/h: \$430 per unit
- >= 7,000 Btu/h and =15,000: \$450 per unit
- > 15,000 Btu/h: \$480 per unit

Vertical Packaged Terminal Heat Pumps

- < 7,000 Btu/h: \$700 per unit
- >= 7,000 Btu/h and =15,000: \$850 per unit
- > 15,000 Btu/h: \$1,000 per unit

Other Electric HVAC Incentives

ECM Circulator Pumps

- ECM Circulator Pump Instant Discount: \$100
- [Click here](#) for more information.

Energy Recovery Ventilator (ERV) Systems

- Sensible heat recovery = 55% to< 65% - \$1.50/CFM
- Sensible heat recovery = 65% to< 75% - \$1.75/CFM
- Sensible heat recovery = 75% to< 85% - \$2.00/CFM
- Sensible heat recovery = 85% - \$2.25/CFM

Variable-Frequency Drive (VFD) Systems

- \$400 - \$2,300 per unit (incentive varies by system horsepower)

Biomass Boilers and Furnaces

- [Click here](#) for information on incentives for these systems.

Next Steps

1. Work with an Efficiency Maine Qualified Partner to install high-efficiency cooling solutions. [Click here](#) to find a Qualified Partner working near you. Or If you work with a contractor that is not yet a Qualified Partner, urge your contractor to find out more information [here](#).
2. Efficiency Maine reserves the right to require pre-approval for any Program application proposing an incentive of **\$5,000 or more**.
3. As part of the project approval process, you will accept the C&I Prescriptive Program's [Terms and Conditions](#).

2025 Discounted Screw-In LEDs Program

(Existing Buildings)

Administrator: Efficiency Maine

Description

Efficiency Maine discounts screw-in LEDs at retailers and distributors across the state. Customers do not need to file paperwork or wait for rebate checks.

Eligible Scope

Eligibility

- All customers are eligible as long as the bulbs are installed in Maine.
- Customers buying more than 20 bulbs at a retail location must request a bulk-purchase waiver.
- Customers buying from a distributor must provide a Maine installation address and other information.
- Bulbs purchased from a distributor may be subject to inspection.
- It is not necessary to work with a registered contractor.
- Discounts are available on LEDs of various bulb shapes, bases, and wattages.
- Eligible products include A-line bulbs, spotlights, floodlights, and candelabra bulbs.

Resources

- [Find a participating retailer](#)

- [Find participating distributors](#)
- [Learn about business incentives for other types of lighting](#)
- [Learn more about screw-in bulbs](#)
- [Read Retail LED Upgrade Case Studies](#)

Estimated Funds

Min Funds

Incentive depends on the specific distributor.

Max Funds

Incentive depends on the specific distributor.

Next Steps

1. Discounts are available on LEDs of various bulb shapes, bases, and wattages.
 - > To find a participating retailer, [click here](#).
 - > To find a participating distributor, [click here](#).
 - > To find the best prices on retail bulbs, [click here](#).

2025 Commercial and Industrial (C&I) Custom Program - Electric Projects

(Existing Buildings)

Administrator: Efficiency Maine

Apply Services

IncentiFind can help you APPLY to this incentive. Our fee is 30% of the total rebate value.

Description

Maine businesses, nonprofits, institutions and governments are eligible for funding for electrical energy efficiency projects through Efficiency Maine's Commercial and Industrial (C&I) Custom Program.

Eligible Scope

Maine businesses, nonprofits, institutions and governments are eligible for funding for electrical energy efficiency projects through Efficiency Maine's Commercial and Industrial (C&I) Custom Program.

Awarded projects include process improvements, HVAC controls, installation of VFDs on motors, chiller and refrigeration enhancements, and pump upgrades. For a list of previously awarded custom projects, [click here](#).

Eligible Projects

- A measure (or set of measures) at a single facility or campus that increases the end-use electrical efficiency, resulting in at least 36,000 kWh of annual reductions in grid-supplied energy when compared to a baseline.

Ineligible Projects

- Measures that are eligible for Efficiency Maine's C&I Prescriptive Incentive Program. This includes the majority of lighting measures, with a few specific exceptions.
- Projects that have a benefit-to-cost ratio less than 1, as per Efficiency Maine's benefit-cost test.
- Projects that have a simple payback under one year (after factoring in the Efficiency Maine incentive).
- Projects that involve measures required by state or federal law or local building or energy codes, or are deemed by Efficiency Maine to be standard industry practice measures.
- Projects for which the customer (or its affiliate) has made binding commitments to proceed prior to the official award of funding under this Custom Program.
- Measures that rely solely on human behavior changes or facility maintenance.
- Projects for customers that do not have an account with a Maine electric utility.
- Feasibility studies.
- Power quality, power factor, and power conditioning projects.
- Projects that do not result in an overall kWh use reduction. An exception is made for measures that are intended to expand facility use or production and will result in an overall kWh use reduction when compared to an alternative code-compliant, baseline alternative.
- Fundraising seed money for projects to be completed and funded subsequently.

Custom Program's Terms and Conditions

Program Opportunity Notice (guidelines and project application).

Estimated Funds

Min Funds

Varies by project.

Max Funds

Funding Overview

- Funding levels will range from a minimum of \$10,000 to a maximum of \$1,000,000 per facility up to 50% of the total project costs.

- Projects with an estimated incentive over \$200,000 will require a formal contract with the Efficiency Maine Trust.
- Projects with an estimated incentive below \$200,000 require that participants agree to the Custom Program's Terms and Conditions.
- For retrofits of existing equipment, applicants must provide a minimum 50% cost share for the project.
- Incentive awards are capped based on the magnitude of the validated annual reduction in grid-supplied energy (kWh/year). Incentives will not exceed \$0.28 per kWh of validated annual reduction in grid supplied energy.
- Efficiency Maine will consider new applications until the available program funding is exhausted.

Next Steps

1. To get started, review the Electric Project Application Cover Sheet and review the Program Opportunity Notice (guidelines and project application).

2025 Commercial and Industrial (C&I) Custom Program - Energy Storage System Projects

(Existing Buildings)

Administrator: Efficiency Maine

Apply Services

IncentiFind can connect you to our expert who can explain why this incentive may be right for your project.

Description

Efficiency Maine's Energy Storage System (ESS) Program Opportunity Notice (PON) offers performance based incentives for the deployment of energy storage systems during summer peak demand conditions.

All demand metered customers (commercial, nonprofits, institutions and government) are eligible to participate.

Eligible Scope

Efficiency Maine's Energy Storage System (ESS) Program Opportunity Notice (PON) offers performance based incentives for the deployment of energy storage systems during summer peak demand conditions.

All demand metered customers (commercial, nonprofits, institutions and government) are eligible to participate.

Eligible Projects

Eligible projects must be interconnected behind the facility utility meter and must be located in Maine with a Maine electric utility account. Awarded incentives will be based on the amount of facility electric load (kW) that the proposed system can reduce during summer peak demand hours. Additionally, awarded systems must:

- Be approved by the Trust prior to installation.
- Be at least 20 kW.
- Maintain a minimum 80% round-trip efficiency.
- Be able to collect and transmit 15-minute interval data.
- Carry a 10-year manufacturer warranty.
- Be UL-listed or certified by another nationally recognized testing lab.

Ineligible Projects

- Systems configured for grid export.
- Participants without the required interval metering and data transmission capability.
- Facilities not located in Maine or served by a Maine electric utility.
- Residential and small business customers.

Estimated Funds

Min Funds

Varies by project.

Max Funds

Funding Overview

Incentives awarded through this PON will be paid each fall for 5 years following an annual evaluation of the project's performance. Additionally, incentives will be subject to the following limitations:

- \$200 per kW of validated reduction in grid supplied power.
- Incentives will be on average load reduction achieved for fifteen (15) dispatches during summer peak demand conditions.
- Incentive awards will be at least \$4,000 and not more than \$600,000 per year, per project, for 5 years.
- All projects awarded will require a formal contract with Efficiency Maine.

Next Steps

1. Check your eligibility.
2. To get started, please review the [Program Opportunity Notice](#) (application guidelines, award criteria, and limitations).

2025 Commercial and Industrial (C&I) Custom Program - Custom Distributed Generation Projects

(Existing Buildings)

Administrator: Efficiency Maine

Apply Services

IncentiFind can help you APPLY to this incentive. Our fee is 30% of the total rebate value.

Description

Maine businesses, nonprofits, institutions and governments are eligible for funding for distributed generation projects through Efficiency Maine's Commercial and Industrial (C&I) Custom Program. Distributed generation projects are behind-the-meter generation projects that reduce the consumption of grid-supplied electricity and meet Efficiency Maine's cost-benefit analysis.

Combined heat & power (CHP) projects are the most common type of distributed generation project completed through the C&I Custom Program.

Eligible Scope

Maine businesses, nonprofits, institutions and governments are eligible for funding for distributed generation projects through Efficiency Maine's Commercial and Industrial (C&I) Custom Program. Distributed generation projects are behind-the-meter generation projects that reduce the consumption of grid-supplied electricity and meet Efficiency Maine's cost-benefit analysis.

Combined heat & power (CHP) projects are the most common type of distributed generation project completed through the C&I Custom Program.

Eligible Projects

- A distributed generation project that reduces on-site electricity consumption from the grid.
- A distributed generation project must have an operating efficiency of 60% or greater.
- The project must result in kWh reductions of at least 36,000 kWh annually
- The project also must include a meter dedicated to providing 15-minute interval energy data to Efficiency Maine.

Ineligible Projects

- Projects that have a benefit-to-cost ratio less than 1, as per Efficiency Maine's benefit-cost test.

- Projects that have a simple payback under one year (after factoring in the Efficiency Maine incentive).
- Projects that export electricity to the grid (net metering) or to other customers.
- Projects for which the customer (or its affiliate) has made binding commitments to proceed prior to the official award of funding under this Custom Program.
- Projects for customers that do not have an account with a Maine electric utility.
- Feasibility studies.
- Power quality, power factor, and power conditioning projects.
- Fundraising seed money for projects to be completed and funded subsequently.

Estimated Funds

Min Funds

Varies by project.

Max Funds

Funding Overview

- Funding levels will range from a minimum of \$10,000 to a maximum of \$1,000,000 per facility up to 50% of the total project costs.
- Projects of all sizes will require a formal contract with the Efficiency Maine Trust.
- Applicants must provide a minimum 50% cost share for the project.
- Incentive awards are capped based on the magnitude of the validated annual reduction in grid-supplied energy (kWh/year). Incentives will not exceed \$0.28 per kWh of validated annual reduction in grid-supplied energy.
- Efficiency Maine will consider new applications until the available program funding is exhausted.

Next Steps

1. Check your eligibility.
2. To get started, please review the following:
 - [Distributed Generation Project Application Cover Sheet](#)
 - [Program Opportunity Notice](#) (project application and guidelines)
 - [Distributed Generation Technical Analysis Checklist](#) for those projects involving a Technical Assistance (TA) study
 - [Distributed Generation Project Application Checklist](#)

8.2 FEDERAL INCENTIVES

179D - Energy Efficient Commercial Buildings Deduction

Section 179D of the U.S. Internal Revenue Code provides a tax deduction for investments in energy-efficient improvements made to commercial buildings. The provision is designed to incentivize property owners and tenants to enhance the energy performance of their properties, thereby promoting energy conservation and reducing utility costs. The deduction can be claimed by the owner of the commercial building or, if they are not the taxpayer, the tenant who makes the qualifying improvements. The deduction applies to improvements made to buildings used for commercial purposes, including retail spaces, office buildings, and industrial facilities. The deduction is allowed under Internal Revenue Code (IRC) Section 179D. It was expanded under the Inflation Reduction Act of 2022.

1. Types of Improvements:

- The interior lighting systems, the heating, cooling, ventilation, and hot water systems, or the building envelope
- It must be certified as being installed as part of a plan to reduce the total annual energy and power costs for the above systems by 25% or more in comparison to a reference building meeting the minimum requirements of ASHRAE Reference Standard 90.1.

2. Amount of Deduction

- The cost of the installed property, or;
- The savings per square foot calculated as:
 - \$0.50 per square foot for a building with 25% energy savings
 - **Plus** \$0.02 per square foot for each percentage point of energy savings above 25%
 - **Up to** a maximum of \$1.00 per square foot for a building with 50% energy savings
- Expenses deducted in the prior 3 years (4 years for an allocated deduction) reduce the maximum deduction before computing the current-year deduction.
- Prevailing wage and apprenticeship bonus: Beginning in 2023, if local prevailing wages are paid and apprenticeship requirements are met, an increased maximum deduction applies. The maximum amount increases to **5 times** the savings per square foot amount.

3. Certification Process:

- **Qualified Professional:** A certification must be provided by a qualified professional confirming that the improvements meet the required energy savings.

- **Documentation:** Detailed documentation and calculations are required to substantiate the claim, including energy modeling and performance testing.

4. **Benefits:**

- **Tax Savings:** The deduction can significantly reduce a business's tax liability, offering a financial incentive to invest in energy-efficient upgrades.
- **Operational Savings:** Beyond tax benefits, energy-efficient improvements often lead to reduced utility bills and lower operational costs.

5. **Legislative Context:**

- **Expiration and Extensions:** Now that the IRC 179D provision is permanent, there is an inflation adjustment for the deduction for property placed in service after December 31, 2020.

6. **What can the property do?**

- AEI can connect the property with partners qualified to complete 179D certification if requested.

9.0 SIGNATURES OF PARTICIPATING PROFESSIONALS

AEI Consultants performed this ASHRAE Level II Energy Audit for the Property located at 37 Firefly Lane, Bar Harbor, Hancock County, Maine, in conformance with the scope and limitations of ASHRAE *Procedures for Commercial Building Energy Audits, Second Edition*, ANSI/ASHRAE/ACCA Standard 211-2018, *Standard for Commercial Building Energy Audits*.

Prepared By:



Joshua Martin
Report Author

Reviewed By:



Craig Burcham, CEM
Senior Author



Joshua Martin
Site Assessor

APPENDIX A

PROPERTY PHOTOGRAPHS



1. Propane Stove



2. Fire Station Exterior



3. Fire Station Interior



4. Fire Station Interior



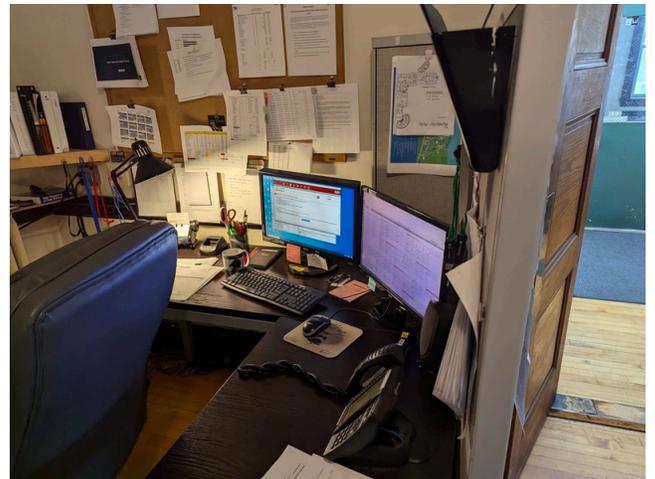
5. Radiator



6. Fire Station Interior



7. Fire Station Interior



8. Fire Station Interior



9. Fire Station Toilet



10. Fire Station Bathroom Sink



11. Fire Station PTAC Unit



12. Fire Station Radiator



13. Fire Station Ceiling Fan



14. Fire Station Garage



15. Police Station Boiler



16. Domestic Water Heater



17. Fire Station Boiler



18. Kitchen Hood



19. Dishwasher



20. Kitchen Sink



21. Kitchen Sink



22. Interior Mini-Split HVAC Unit



23. Interior Building Shell



24. PTAC Unit



25. Mechanical Thermostat



26. Port Security Exterior



27. Port Security Interior



28. Refrigerator



29. Port Security Interior



30. Port Security Exterior



31. Port Security Interior Mini-Split HVAC Unit



32. Port Security Electric Storage Domestic Water Heater



33. Port Security Interior Lighting



34. Port Security Interior Office Area



35. Port Security Interior Lighting



36. Port Security Digital Thermostat



37. Port Security Interior Shell



38. Port Security Interior Shell



39. Port Security Interior



40. Port Security Interior Mini-Split HVAC Unit



41. Port Security Exterior Shell



42. Pier Comfort Station Lighting



43. Pier Comfort Station Shell



44. Residential Laundry Machines



45. Mini-fridge



46. Commercial Washing Machine

APPENDIX B

SUPPORTING DOCUMENTATION

ASHRAE Equipment Life Expectancy chart

ASHRAE is the industry organization that sets the standards and guidelines for most all HVAC-R equipment.
For additional info about ASHRAE the website is www.ashrae.org .

Equipment Item	Median Years	Equipment Item	Median Years	Equipment Item	Median Years
Air conditioners		Air terminals		Air-cooled condensers	20
Window unit	10	Diffusers, grilles, and registers	27	Evaporative condensers	20
Residential single or Split Package	15	Induction and fan coil units	20	Insulation	
Commercial through-the wall	15	VAV and double-duct boxes	20	Molded Blanket	20 24
Water-cooled package	15	Air washers	17	Pumps	
Heat Pumps		Ductwork	30	Base-mounted	20
Residential air-to-air	15	Dampers	20	Pipe-mounted	10
Commercial air-to-air	15	Fans		Sump and well	10
Commercial water-to-air	19	Centrifugal	25	Condensate	15
Roof-top air conditioners		Axial	20	Reciprocating engines	20
Single-zone	15	Propeller	15	Steam turbines	30
Multi-zone	15	Ventilating roof-mounted	20	Electric motors	18
Boilers, hot water (steam)		Coils		Motor starters	17
Steel water-tube	24 (30)	DX, water, or steam	20	Electric transformers	30
Steel fire-tube	25 (25)	Electric	15	Controls	
Cast iron	35 (30)	Heat Exchangers		Pneumatic	20
Electric	15	Shell-and-tube	24	Electric	16
Burners	21	Reciprocating compressors	20	Electronic	15
Furnaces		Packaged chillers		Valve actuators	
Gas- or oil-fired	18	Reciprocating	20	Hydraulic	15
Unit heaters		Centrifugal	23	Pneumatic	20
Gas or electric	13	Absorption	23	Self-contained	10
Hot water or steam	20	Cooling towers			
Radiant Heaters		Galvanized metal	20		
Electric	10	Wood	20		
Hot water or steam	25	Ceramic	34		

APPENDIX C

EWEM CALCULATION WORKSHEETS

Low Flow Showerheads

Replace 1 Existing Higher Flow Showerheads With 1.5 GPM WaterSense Labeled Showerheads. Showerheads must bear the manufacturer's flow ratings. *The savings and payback period shown for this measure assume that EWEM #5 has been implemented

Total Number of Shower Heads To Be Replaced	1	
Existing Shower Hot Water Consumption	50,112	Gallons
Proposed Shower Hot Water Consumption	30,067	Gallons
GPM of Proposed Shower Head *	1.5	GPM

**(Federal Law limits all new showerheads to a max flow rate of 2.5 GPM)*

Water & Energy Savings Calculations

Total Water Consumption	73,000	Gallons
Annual Water Savings	29.2	kGal
<i>Hot Water Savings</i>	20,045	
Existing Domestic Water Heater Efficiency	90.1%	
<i>Proposed DWH Efficiency</i>	3.05	COP
Average Hot Water Temperature (F)	135	Deg F
<i>Assuming an average 55°F water supply temp year round</i>		
Existing Water Heater Energy Consumption for Showers:	36,586,777	kBTU
Annual Energy Consumption with HPWH:	10,799,242	
Proposed Water Heater Energy Consumption with Existing DWH:	21,952,066	kBTU
Proposed Consumption with HPWH:	6,479,545	kBTU
Energy Savings Over Baseline	4,289	kWh
<i>Incremental Energy Savings with New HPWH:</i>	1,266	kWh

Cost Savings Calculations

(Insert Tariff Rate For Hot Water Heater Fuel Only)

Electrical Tariff (\$/Kwh)	\$0.149	\$\$
Gas Tariff (\$/Therms)	\$0.000	\$\$
Water Tariff (\$/1000 Gal)	\$19.100	\$\$
#2 Fuel Oil Cost (\$/Gal)	\$2.759	
Annual Cost Savings In Form of Water	\$558	\$\$
Annual Energy Savings Over Baseline	\$639	\$\$
Annual Energy Savings with Proposed HPWH	\$189	\$\$
Estimated Total Annual Cost Savings	\$746	\$\$

Estimated Installation Costs

Cost Per Faucet	\$18.75	
Estimated Total Installation Cost	\$19	\$\$

Simple Payback Period	0.03	Years
-----------------------	------	-------

Replace existing 75% efficient #2 Fuel Oil unit heaters with new 96% efficient LP Gas Propane-fired unit heaters

Quantity of Existing Boilers	1	Each
Annual Heating Hours	2,728	Hours
Percent of Heating Hours that Boiler Runs		
Existing Boiler Input Energy Source	Fuel Oil	
Current Boiler Efficiency	75%	
Existing Boiler Input Capacity	151	MBH
Actual Heat Output Capacity with Existing Boiler	113	MBH
Total Annual Energy Input of Existing Boiler (BTUs)	100,347,348	BTUs
Total Annual Energy Input of Existing Boiler (Natural Gas)	0	Therms
Total Annual Energy Input of Existing Boiler (Electrical)	0	kWh
Total Annual Energy Input of Existing Boiler (Fuel Oil)	724.5	Gallons
Total Annual Energy Input of Existing Boiler (Propane)	0	Gallons
New Boiler Input Energy Source	LP Gas	
New Boiler Model:	I-Series	
New Boiler Efficiency	96%	
New Boiler Input Required	118	MBH
Total Annual Energy Input of New Boiler (BTUs)	78,396,366	BTUs
Total Annual Energy Input of New Boiler (Propane)	857	Gallons
Cost Per Electrical kWh	\$0.15	per kWh
Cost Per Fuel Oil per Gallon	\$2.76	per Gallon
Cost Per Propane Gallon	\$1.96	per Gallon
Existing Fuel Oil Equipment Operating Cost:	\$1,998.98	\$
Proposed Propane Equipment Operating Cost:	\$1,679.31	\$
Operating Cost Savings	\$319.67	\$
Fuel Oil Cost Savings	\$1,999	\$
Propane Cost Savings	-\$1,679	\$
Total Cost Savings	\$320	\$
Number of Boiler(s) to Replace with High Efficiency:	1	Each
Output Capacity of Replacement High Efficiency Boiler(s):	115	MBH
Total Cost to Replace w/ 96% Efficient Boiler	\$12,006	Dollars
Total Cost to Replace Existing Boiler in Kind	\$10,606	Dollars
Incremental Replacement Cost for 96% Efficient Boiler	\$1,400	Dollars
Payback for High Efficiency Boiler if Existing is Relatively New	37.6	Years
Payback for High Efficiency Boiler if Existing is at end of EUL	4.4	Years

Replace existing 82% efficient #2 Fuel Oil Fuel Oil #2 Boiler with new 98% efficient LP Gas Propane-fired boiler

Quantity of Existing Boilers	1	Each
Annual Heating Hours	2,728	Hours
Percent of Heating Hours that Boiler Runs		
Existing Boiler Input Energy Source	Fuel Oil	
Current Boiler Efficiency	82%	
Existing Boiler Input Capacity	534	MBH
Actual Heat Output Capacity with Existing Boiler	438	MBH
Total Annual Energy Input of Existing Boiler (BTUs)	339,570,202	BTUs
Total Annual Energy Input of Existing Boiler (Fuel Oil)	2,451.8	Gallons
Total Annual Energy Input of Existing Boiler (Propane)		Gallons
New Boiler Input Energy Source	LP Gas	
New Boiler Model:	SVF500	
New Boiler Efficiency	98%	
New Boiler Input Required	447	MBH
Total Annual Energy Input of New Boiler (BTUs)	284,130,169	BTUs
Total Annual Energy Input of New Boiler (Propane)	3,105	Gallons
Cost Per Electrical kWh	\$0.15	per kWh
Cost Per Fuel Oil per Gallon	\$2.76	per Gallon
Cost Per Propane Gallon	\$1.96	per Gallon
Existing Fuel Oil Equipment Operating Cost:	\$6,764.43	\$
Proposed Propane Equipment Operating Cost:	\$6,086.29	\$
Operating Cost Savings	\$678.15	\$
Fuel Oil Cost Savings	\$6,764	\$
Propane Cost Savings	-\$6,086	\$
Total Cost Savings	\$678	\$
Number of Boiler(s) to Replace with High Efficiency:	1	Each
Output Capacity of Replacement High Efficiency Boiler(s):	490	MBH
Total Cost to Replace w/ 98% Efficient Boiler	\$24,218	Dollars
Total Cost to Replace Existing Boiler in Kind	\$22,118	Dollars
Incremental Replacement Cost for 98% Efficient Boiler	\$2,100	Dollars
Payback for High Efficiency Boiler if Existing is Relatively New	35.7	Years
Payback for High Efficiency Boiler if Existing is at end of EUL	3.1	Years

Lighting Audit (Common Area)

Area of Building	Existing Fixture	Total # Fixtures	Lamps Per Fixture	Total # of Lamps	LED Equivalent Wattage	Current kWh Usage	kWh Usage w/ LED	kWh Saved Per Year	Cost Per kWh	Current Annual Op Cost	Annual Cost Using LEDs	Savings	Cost to Install Lighting	Pay back
Basement	2B 40W 4' T12 Electronic	6	2	12	17	1,485	631	854	\$0.15	\$221	\$94	\$127	\$223	1.75555
Interior	1B 8W LED	127	1	127	0	3,144	3,144	0	\$0.15	\$469	\$0	\$0	\$0	-
Interior	1B 32W 4' T8	2	1	2	11	198	68	130	\$0.15	\$30	\$10	\$19	\$17	0.89012
Interior	2B 32W 4' T8	23	2	46	11	4,554	1,566	2,989	\$0.15	\$679	\$233	\$445	\$397	0.89012
Interior	1B 9W LED	6	1	6	0	473	473	0	\$0.15	\$71	\$0	\$0	\$0	-
Interior	3B 32W 4' T8	11	3	33	11	5,398	1,856	3,543	\$0.15	\$805	\$277	\$528	\$284	0.53874
Exterior	1B 60W Incandescent	0	0	0	0	808	121	686	\$0.15	\$120.37	\$18.06	\$102.31	\$17	0.17
Exterior	1B 9W LED	0	0	0	0	61	61	0	\$0.15	\$9.03	\$9.03	\$0.00	\$0	-
						16,120	7,919	8,202		\$2,403	\$641	\$1,222	\$939	0.8

Exterior Lighting Audit

Area of Building	Existing Fixture	Total # Fixtures	Lamps Per Fixture	Total # of Lamps	LED Equivalent Wattage	Current kWh Usage	kWh Usage w/ LED	kWh Saved Per Year	Cost Per kWh	Current Annual Op Cost	Annual Cost Using LEDs	Savings	Cost to Install Bi-Level Fixtures	Pay back
Exterior	1B 75W LED	2	1	2	75	1,010	454	555	\$0.15	\$150	\$68	\$83	\$186	2.25
Exterior	1B 14W LED	6	1	6	14	565	254	311	\$0.15	\$84	\$38	\$46	\$186	4.02
Exterior	1B 14W LED	4	1	4	14	377	170	207	\$0.15	\$56	\$25	\$31	\$124	4.02
						1,952	878	1,073		\$ 291	\$ 131	\$ 160	\$ 497	3.10

Low Flow Bathroom Sink Aerators

Replace 6 Existing Bathroom Faucet Aerators With 0.5 GPM WaterSense Labeled Low Flow Aerators. Aerator housings must bear 0.5 GPM manufacturer flow ratings. *The savings and payback period shown for this measure assume that EWEM #5 has been implemented.

Total Number of Aerators To Be Replaced 6

GPM of Proposed Aerator * 0.5 GPM

**(Federal Law limits all new Aerators to a max flow rate of 2.2 GPM)*

Water & Energy Savings Calculations

Total Water Consumption 25,273

Annual Water Savings 16,133.0 Gal

Hot Water Savings 10,159

Existing Domestic Water Heater Efficiency 90.1%

Proposed DWH Efficiency 3.05 COP

Average Hot Water Temperature (F) 135 Deg F

Assuming an average 55°F water supply temp year round

Annual Water Heater Energy Consumption for Sinks: 11,663,707 kBTU

Annual Energy Consumption with HPWH: 3,442,751

Proposed Water Heater Energy Consumption with Existing DWH: 4,246,452 kBTU

Proposed Consumption with HPWH: 1,253,416 kBTU

Energy Savings Over Baseline 2,174 kWh

Incremental Energy Savings with New HPWH: 642 kWh

Cost Savings Calculations

(Insert Tariff Rate For Hot Water Heater Fuel Only)

Electrical Tariff (\$/Kwh) \$0.149 \$\$

Gas Tariff (\$/Therms) \$0.000 \$\$

Water Tariff (\$/1000 Gal) \$19.100 \$\$

#2 Fuel Oil Cost (\$/Gal) \$2.759

Annual Cost Savings In Form of Water \$308 \$\$

Annual Energy Savings Over Baseline \$324 \$\$

Annual Energy Savings with Proposed HPWH \$96 \$\$

Estimated Total Annual Cost Savings \$404 \$\$

Estimated Installation Costs

Cost Per Faucet Total

Estimated Total Installation Cost \$16.75 \$\$

Simple Payback Period 0.04 Years

Low Flow Kitchen Faucet Aerators

Replace 1 Existing Kitchen Faucet Aerators With 1.5 GPM Low-Flow Aerators. Aerator housings must have a 1.5 GPM manufacturer flow rating. *The savings and payback period shown for this measure assume that EWEM #5 has been implemented.

Total Number of Aerators To Be Replaced	1	
GPM of Existing Aerator	2.0	GPM
GPM of Proposed Aerator *	1.5	GPM

**(Federal Law Requires all new Aerators to have a max flow rate of 2.5 GPM)*

Water & Energy Savings Calculations

Total Water Savings	7300	
Annual Water Savings	7.3	kGal
<i>Hot Water Savings</i>	4,553	
Existing Domestic Water Heater Efficiency	90.1%	
<i>Proposed DWH Efficiency</i>	3.05	COP
Average Hot Water Temperature (F)	135	Deg F
Existing Annual Energy Consumption:	13,297,863	kBTU
Existing Water Heater Energy Consumption with DWH:	3,925,102	kBTU
Proposed Consumption with existing DWH:	9,973,397	kBTU
Proposed Consumption with HPWH:	2,943,826	
Energy Savings Over Baseline	974	kWh
<i>Incremental Energy Savings with New HPWH:</i>	287	kWh

Cost Savings Calculations

(Insert Tariff Rate For Hot Water Heater Fuel Only)

Electrical Tariff (\$/Kwh)	\$0.149	\$\$
Gas Tariff (\$/Therms)	\$0.000	\$\$
Water Tariff (\$/1000 Gal)	\$19.100	\$\$
#2 Fuel Oil Cost (\$/Gal)	\$2.759	
Annual Cost Savings In Form of Water	\$139	\$\$
Annual Energy Savings From Original Water Heater	\$145	\$\$
Annual Energy Savings with Proposed HPWH	\$43	\$\$
Estimated Total Annual Cost Savings	\$182	\$\$

Estimated Installation Costs

Cost Per Aerator	\$16.75	
Estimated Total Installation Cost	\$17	\$\$

Simple Payback Period	0.1	Years
-----------------------	-----	-------

Boiler Pipe Insulation

Add R-5.4 insulation to 100 LF of 1 inch diameter domestic hot water piping, including flexible connectors, tees, and valves. ARMAFLEX 3/4 - inch wall thickness or equivalent insulation values. *The savings and payback shown for this measure assume that EWEMs #1 & #2 have been implemented.

Boiler Fuel	LP Gas	
Propane Rate	\$1.960	
Boiler Efficiency	96%	
Pipe Material Type	Copper	
Outside Diameter of Pipe	1	Inches
Length of Pipe	100	Feet
Surface Area in Sq Ft	26.18	Sq Feet
Inner Pipe Diameter, D1	1.0550	Inches
Outer Pipe Diameter, D2	1.1250	Inches
Insulation Thickness, (D3-D2)/2	0.803	Inches
Outside Diameter w/ Insulation, D3	2.731	Inches
R-Value of Insulation	5.4	
New R-Value of Piping	8.131	
Temperature of Hot Water	165	Deg. F
Room Temperature (Average)	72.4	Deg. F
Delta Temperature	92.6	Deg. F
Annual hours of Operation	2728	Hrs.
Original Heat Energy Loss Btu	14,512,202	Btu
Heat Loss w/ Added Insulation	4,902,234	Btu
Energy Savings w/ Added Insulation	9,609,969	Btu
Energy Savings Gallons	109	Gal
Annual Cost Savings	\$214	\$\$\$
Cost per linear foot of insulation	\$7.68	/foot
Total Cost to Insulate Pipe	\$768	
Payback	3.58	Years

**REPLACE EXISTING ELECTRIC WATER HEATER WITH HEAT PUMP
WATER HEATER**

Replace 1 Existing Electric Storage Tank Type Water Heater with 1 Hybrid Heat Pump Water Heater with 1 (HPWH) with 1 (HPWH) with a minimum UEF of 3.75.

Quantity of Existing Water Heaters	1	Each
Water Heater Fuel	Electricity	
Annual Gallons of Hot Water Consumed	102,827	
Existing DWH Efficiency	90%	
DHW Delta T	79.7	°F
Annual Energy Consumed by DWH	75,802	kBTU
Annual Energy Consumed by DWH	22,215	kWh
Quantity of Heat Pump Water Heaters	1	Each
Select Desired HPWH From the List	XE80T10HS45**	
Rated HPWH COP	4.07	
Average HPWH COP	3.05	
Annual kWh Consumed with HPWHs	6,557	kWh/Year
Energy Saving by using HPWH	15,658	kBTU/Year
Energy Saving by using HPWH	4,589	kWh/Year
Energy Cost Per kWh	\$0.149	\$/kWh
Approximate Cost for One HPWH	\$2,029	\$
Demo and Installation Labor	\$1,100	\$
Cost Avoidance Per Year with HPWH	\$684	\$
Total Cost for New HPWH	\$3,129	\$
Payback	4.6	Years

APPENDIX D

PROJECT TEAM



Joshua D. Martin

Senior Energy Engineer

EDUCATION

- Bachelor of Science in Mechanical Engineering with a Minor in Mathematical Sciences - Clemson University, 2009

CERTIFICATIONS

- Certified Energy Manager - Association of Energy Engineers, 2023
- Engineer In Training - South Carolina Board of Professional Engineers, 2009

SUMMARY OF PROFESSIONAL EXPERIENCE

Mr. Joshua D. Martin is a Senior Energy Engineer in the energy services division, distinguished as a Certified Energy Manager (C.E.M.) and Engineer in Training (E.I.T.). His robust background includes over 12 years of experience in energy efficiency engineering, project management, building commissioning, and sustainability consulting. Throughout his career, he has specialized in commercial building energy consulting, executing energy audits, conducting site visits, and identifying energy conservation measures (ECMs) across various sectors, including residential, commercial, multi-family, industrial, MUSH (Municipal, University, School, and Hospital), and agricultural.

Mr. Martin is passionate about helping clients accomplish their sustainability goals, qualify for green loan programs, and satisfy local building code requirements. More recently, Mr. Martin has worked with clients to help them achieve their greenhouse gas reduction goals through decarbonization and electrification studies.

PROJECT EXPERIENCE

Project experience for Mr. Martin includes:

- Project Management
- 50+ Multifamily Building Energy Efficiency Audits
- Fannie Mae and Freddy Mac Green Up program compliance
- Indoor Air Quality Measurement and Compliance for ASHRAE 62.1
- ASHRAE Level I & II Energy Audits for Commercial, Agricultural, and Industrial Facilities
- Building Commissioning and Retro-commissioning for Commercial and Industrial Facilities
- Energy Star Certifications for Residential and Commercial Facilities
- Measurement and Verification of Energy Efficiency Projects
- Energy Efficiency and Sustainability Consulting
- Greenhouse Gas Reduction Studies
- Energy Modeling
- Data Analysis

Mr. Martin has worked in the energy efficiency and sustainability services field since 2011. He is committed to advancing products, services, and ideas that reduce environmental impact and promote sustainability. He believes in contributing to a greener future without compromising resources for future generations.



Craig Burcham

Senior Engineer, Energy Services

EDUCATION

- Master of Business Administration, East Carolina University
- Bachelor of Science - Mechanical Engineering, Louisiana Tech University

CERTIFICATIONS

- Certified Energy Manager - Association of Energy Engineers - 20086
- Arkansas Licensed Professional Engineer - 22152
- South Carolina Licensed Professional Engineer - 39645

SUMMARY OF PROFESSIONAL EXPERIENCE

Mr. Burcham provides expertise in energy efficiency evaluations in several markets including industrial, commercial, and residential properties. He has more than ten years of experience developing guaranteed energy saving performance contracting projects for clients throughout the Southeast and Midwest United States. He also has three years of experience with large utility energy efficiency program execution as well as four years of experience performing single family residential pre-sale home inspections and energy assessments.

PROJECT EXPERIENCE

Project experience for Mr. Burcham includes:

- Lead developer on 18 performance contracting projects, \$90M in total project value
- 100+ ASHRAE Level 1, 2, 3 Energy Audits
- 1000+ single family residential home inspections and energy assessments