Energy Audit Report

Homeowner(s): Morrie Newell

Address: 29 May Tom Road, Cranberry Isles Maine, 04625

Auditors: Adler Garner, Uriel Orozco Brenes, Zoe Duni

Contact: mdicommunityenergy@coa.edu, (802) 266-0301

Date: September 3 2024

We conducted an energy assessment of your home on 7/3/2024. This report will tell you what we did, what we found, and what we suggest for your home. These suggestions include information on incentives and financing to make improvements more affordable.



**Add here the table of content: in Word go to references and add table of content, in Docs go to the insert and on the bottom add the table of context**

## 1 Summary of your Audit

### 1.1 Visual Inspection and Measurements

We started with a tour and visual inspection of the inside and outside of the home. We identified any visible damage to the building, moisture control strategies, major appliances, and insulation. We measured square footage and volume of the home, as well as the area of all exterior windows and doors. We used a kill-a-watt meter to measure the electricity use of some appliances. During your audit, we used a carbon monoxide meter to measure the ambient carbon monoxide levels throughout the home.

### 1.2 Attic

We entered the attic to check for insulation, air sealing, ventilation, and potential hazards such as mold. Additionally, we visually inspected the attic ventilation and any duct and pipework passing through the attic.

### 1.3 Basement

We visually inspected any appliances in the basement and noted insulation levels, moisture, rodents, and any other concerns.

### 1.4 Blower Door / Air Leakage Test

A blower door test measures the air tightness of a building. We used a specialized fan in an exterior door to generate negative pressure inside your house. The resulting pressure difference between the inside and outside of the house allows us to measure air leakage. To locate the leaks, we used an infrared camera to check for unusually hot and cold spots. We also checked the pressure differences of the rooms to help determine major air leak locations.

### 1.5 Combustion Appliance Safety

We assessed combustion appliances that burn fossil fuels such as propane, heating oil, or kerosene. These include furnaces, boilers, water heaters, and gas ovens. We visually inspected the combustion appliance(s) in your home, but we were unable to perform combustion safety tests. We also performed gas leak detection tests on your propane appliance(s).

## 2 Summary of Recommendations

We recommend the following upgrades for your home. Detailed information about these recommendations and financial resources can be found later in this report.

| Recommendation | Description |
| --- | --- |
| Refrigerator | Replace your refrigerator with a new, EnergyStar certified fridge. Look at the Energy Guide label to compare the energy use of new refrigerators. |
| Freezer | Replace your freezer with a new, EnergyStar certified freezer. Look at the Energy Guide label to compare the energy use of new freezers. |
| Induction Stove/Oven | Induction cooking appliances are more efficient and safer than electric or gas ones. There is no risk of carbon monoxide or other harmful combustion gases, and the surface doesn't heat up without a pot or pan on it. |
| Vapor Barrier | Install a vapor barrier on the basement floor to stop moisture from entering the basement and house. |
| Spray Foam Basement/Crawlspace Walls | Install spray foam on the basement/crawlspace walls to prevent moisture infiltration and reduce heat loss. |
| Attic Insulation and Air Sealing | Air seal the attic and insulate it to at least R-60 (18” of loose-fill cellulose insulation). |
| Blown-in Cellulose Wall Insulation | Insulate the wall stud cavities with dense packed, blown-in cellulose insulation. |
| Continuous Exterior Wall Insulation | Add a continuous layer of insulation and potentially replace the air and moisture barrier once it becomes time to replace the siding. |
| Electrical Panel Upgrade | Replace your existing electrical panel to increase the capacity to 200 amps (and address potential safety hazards). |
| Air Source Heat Pump | Install air source heat pumps and whole-house surge protection. |
| EV+Charger | An electric vehicle will eliminate your gas costs and reduce fossil fuel dependence. A 2020 study by Consumer Reports found that lifetime ownership costs were significantly lower for EVs, saving between $6,000 - $10,000 over their lifetimes. |
| Other 1 | TYPE HERE (Other 1) |
| Pipe Insulation | Insulate both hot and cold water pipes that are uninsulated in the basement/crawlspace. This will save energy and prevent condensation. |
| Whole-House Surge Protection | Upgrade your electrical panel to add whole-house surge protection. |
| Misc. Air Sealing | We recommend sealing air leaks and weatherstripping exterior doors. |
| Other 2 | TYPE HERE (Other 2) |
| Other 3 | TYPE HERE (Other 3) |
| LEDs | Switch your light bulbs to LED light bulbs. LEDs use 80% less energy than incandescent light bulbs which can significantly reduce your electricity bill. We provide free LED light bulbs, contact us for some if we did not give you any during the audit. |
| High-efficiency Shower Head(s) | Install high-efficiency shower heads to reduce the amount of water and energy to heat the water used when showering. |
| Furnace/Boiler Tune-up | Have the furnace and flue inspected and adjusted by a licensed professional. This should be available from your oil or propane delivery company. |
| Window Dressers | Window-Dressers insulating window inserts help air-seal windows and reduce heat loss and gain. There will be a Window-Dresser community build on Great Cranberry Island from November 8th through 14th. Sign up at https://windowdressers.org/sign-up-for-inserts/ There will be a Window Dressers build in Eastport from November 18th through 25th. Contact Pete to sign up: 207-214-4751 or EastportMEEnergy@gmail.com |
| Heat Pump Water Heater | Install a heat pump water heater to provide your hot water for cooking and bathing. This is the most efficient way to heat water and will save hundreds of dollars a year compared to electric resistance, heating oil or propane hot water. It will also help to dehumidify while it's running. If your current water heater burns oil or propane, this will also remove a source of combustion gases from your home. |
| Gutters | Install gutters and downspouts that divert water at least six feet away from the foundation and to where the ground slopes away from the house. |
| Bathroom Exhaust Fan(s) | Bathroom exhaust fans should be rated for at least 80 cubic feet per minute (CFM) if there is a shower. We recommend Panasonic WhisperQuiet or similar fans that don’t create excess noise. |
| Kitchen Exhaust Fan | We recommend a kitchen exhaust fan to remove harmful combustion gases from your home, which should be rated for at least 100 cubic feet per minute (CFM). A fan can also help with moisture concerns. |
| Solar | Rooftop solar can supply most or all of your home electrical demands. Contact a solar company for pricing and details specific to your home. |

## 3 What We Found

### 3.1 Basics

|  |  |
| --- | --- |
| Date Built | 2008 |
| Attic | Batts of Fiberglass , 6 inches |
| Number of floors | 2 |
| Square footage of conditioned space | NA |
| Volume of conditioned space (cubic feet) | NA |

### 3.2 Exterior

|  |  |
| --- | --- |
| Roof age: | 16 |
| Orientation: | North/South |
| Roof type: | Asphalt Shinglesin faircondition. NA |
| Moisture control: | Current moisture control strategies: gutters, ground slopes away from foundation. These were in fair condition .The gutters aren't on all sides of the house. |
| Siding: | wood siding in excellent condition. NA |

### 3.3 Interior/Living space

|  |  |
| --- | --- |
| Walls: | The framing type of the home is platform framing, which means that wall cavities do not extend the full height of the building and are instead separated by floors. There is Batts of Fiberglass insulation 6 inches thick in fair condition. NA |
| Living room: | NA |
| Bathroom(s): | Some had bathroom vent fans, and some didn't. |
| Kitchen: | Downstairs fridge used 0.03 kWh in 87 minutes. NA used NA kWh in NA minutes. No fan, under construction due to water damage. |

### 3.4 Blower Door / Air Leakage Test

A blower door test simulates a 20mph wind hitting your house from all sides.

To run the test, we used a large fan in an exterior door to depressurize your house. As air is pulled out through the fan, an equal volume of air is pulled in through all of the gaps, cracks, and air leaks throughout the house. This allows us to determine the volume of air leakage into the house and to locate bigger air leaks.

To find leaks, we used an infrared camera to check for unusually hot and cold spots. We also checked the pressure differences of the rooms to help determine major air leak locations.

Air leaks are a big source of heat gain in warm weather and heat loss in cold weather. They also allow moisture to get into the home. Below are some numbers, pictures, and descriptions explaining what we found.

|  |  |  |
| --- | --- | --- |
| CFM50: | 4244 | CFM50 describes how many cubic feet per minute of air are leaving the house at 50 pascals of pressure difference (while the blower door is running). For every cubic foot of air that leaves the house, a cubic foot of air enters the house as well. The higher the number, the leakier the house. |
| ACH50: | NA | ACH50 tells us how many air changes per hour are taking place in the house at 50 pascals of pressure difference. This value is normalized for the volume of the house and thus allows for comparison between different houses. The higher the number, the leakier the house. |
| Equivalent leakage area: | NA under natural conditions. | This is the area (in square inches) equivalent to all of the air leaks in the house combined. |
| ACHnatural: | NA | Accounting for the volume of the home, this means that the house exchanges –% of its air every hour. Over one day, the house goes through – complete air changes. |

Using a thermal imaging camera, we looked for major air leakage locations and thermal bridging, where heat is bypassing the insulation. There was evidence of ….

### 3.5 Attic

|  |  |
| --- | --- |
| Area (sq ft): | 0 |
| Insulation type: | Batts of Fiberglass |
| Insulation condition: | NA |
| Air sealing: | There is NAair sealing. NA |
| Other observations: | NA No NA |
| Ventilation: | Yes |
| Ducts: | No |

### 3.6 Basement

|  |  |
| --- | --- |
| Area (sq ft): | NA |
| Inuslation type: | Batts of Fiberglass |
| Insulation condition: | FairNA |
| Insulation of appliances: | Appliances insulated, Ducts/pipes partially insulated |
| Moisture Control: | NAin NAcondition. The gutters aren't on all sides of the house. |
| Ducts: | NoNA |
| Other observations: | There is NANA |

### 3.7 Electrical and Mechanical Systems

|  |  |
| --- | --- |
| Electrical panel: | The electrical panel has and amperage of 200. There are 15 unused breaker spaces. NA |

### 3.8 Energy Bills

| Type | kWh/gallons/cords/tonns | Cost (USD) |
| --- | --- | --- |

## 4 Recommendations

### 4.1 Furnace/Boiler Tune up

*Problem*

\*\* Auditor to describe.\*\*

*Recommendation*

Have the furnace and flue inspected and adjusted by a licensed professional. This should be available from your oil or propane delivery company.

Have the furnace and flue inspected and adjusted by a licensed professional. This should be available from your oil or propane delivery company.

*Estimated Cost/Benefits/Incentives*

A tune-up can improve the efficiency of your furnace/boiler, confirm that it is exhausting properly, and identify areas of concern before they become urgent. If you have a service contract with your fuel delivery company, an annual tune-up is usually included.

### 4.2 High efficiency shower head(s)

*Problem*

Your shower heads use more water and energy than high-efficiency shower heads, thus costing you more money than necessary. Older shower heads use 2.5 gallons or more every minute, which wastes thousands of gallons of water each year and costs you money for every extra gallon of water heated.

*Recommendation*

Install high-efficiency shower heads to reduce the amount of water and energy to heat the water used when showering. We recommend 1.5 gallon per minute shower heads that will save a gallon or more of water for every minute spent in the shower.

Install high-efficiency shower heads to reduce the amount of water and energy to heat the water used when showering.

*Estimated Cost/Benefits/Incentives*

A typical family will save ~10,000 gallons of water per year and over $100 per year in water heating costs. We provide these for free and have several styles for you to choose from; contact us for some if we did not give you any during the audit.

### 4.3 LEDs

*Problem*

Your lighting uses more energy than LED bulbs would. Halogen and incandescent light bulbs use 5-8x more energy than LEDs. This requires significantly more electricity and costs a lot.

*Recommendation*

Switch your light bulbs to LED light bulbs. LEDs use 80% less energy than incandescent light bulbs which can significantly reduce your electricity bill.

Switch your light bulbs to LED light bulbs. LEDs use 80% less energy than incandescent light bulbs which can significantly reduce your electricity bill. We provide free LED light bulbs, contact us for some if we did not give you any during the audit.

*Estimated Cost/Benefits/Incentives*

We provide free LED light bulbs; contact us for some if we did not give you any during the audit. Depending on usage, LEDs can save more than $50 a year.

### 4.4 Window Dressers

*Problem*

Your windows are a source of heat loss, reduce your comfort due to cold surface temperatures, and may also cause moisture condensation or frost in the winter.

*Recommendation*

WindowDressers insulating window inserts help air-seal windows and reduce heat loss and gain. There will be a WindowDresser community build on Great Cranberry Island from November 9th through 14th. Sign up at https://windowdressers.org/sign-up-for-inserts/ There will be a WindowDressers community build in Eastport from November 18th through 25th. Contact Pete to sign up: 207-214-4751 or EastportMEEnergy@gmail.com WindowDressers are transparent and let in light while stopping drafts. Each insert is made of a custom-made pine frame wrapped on each side with tightly sealed, clear polyolefin film, creating an airspace between the two layers for additional insulation. The insert is finished with a compressible foam weather seal. The foam allows enough give for the inserts to be easily slid into place in the fall and removed in the spring while holding firmly enough to provide a tight, friction-based seal. The inserts are installed inside your existing window frame with no fasteners required and last 5-10 years. They are most effective in the winter, but depending on the window’s exposure, they can sometimes be used in the summer to keep the house cooler.

Window-Dressers insulating window inserts help air-seal windows and reduce heat loss and gain. There will be a Window-Dresser community build on Great Cranberry Island from November 8th through 14th. Sign up at https://windowdressers.org/sign-up-for-inserts/ There will be a Window Dressers build in Eastport from November 18th through 25th. Contact Pete to sign up: 207-214-4751 or EastportMEEnergy@gmail.com

*Estimated Cost/Benefits/Incentives*

Insulating window inserts save 5-10% of your heating costs at less than 1/10th the cost of replacement windows. The overall project cost will depend on the number and size of window inserts. Example prices for 2024: small (20 x 36”) - $36 for natural pine frame, $46 for white; medium (30 x 52”) - $50 for natural pine frame, $64 for white; large (44 x 68”) - $67 for natural pine frame, $88 for white. Adjusted pricing for lower-income households is available from WindowDressers upon request. If plastic is damaged, it can be replaced for $15. Households that order inserts are expected to participate in the Community Build where the inserts are made. You can sign up for a 4-hour shift and learn the simple steps in the insert-building process (no previous experience required, no power tools). Each job has “jigs” that make the job easier to do and ensure uniform quality. You will be trained at the beginning of your shift on how to do your task. Volunteering for multiple shifts is encouraged! Mid-shift snacks and a meal are provided to all participants. If you would like to participate, please contact us so we can discuss how the program works and which windows you’d like inserts for.

### 4.5 Heat Pump Water Heater

*Problem*

\*\* Auditor to describe depending on what their current system is. \*\*

*Recommendation*

Install a heat pump water heater to provide your hot water for cooking and bathing. This is the most efficient way to heat water and will save hundreds of dollars a year compared to electric resistance, heating oil or propane hot water. It will also help to dehumidify while it’s running. If your current water heater burns oil or propane, this will also remove a source of combustion gases from your house. We also recommend setting the temperature on the water heater at 130°F for more efficient operation.

Install a heat pump water heater to provide your hot water for cooking and bathing. This is the most efficient way to heat water and will save hundreds of dollars a year compared to electric resistance, heating oil or propane hot water. It will also help to dehumidify while it’s running. If your current water heater burns oil or propane, this will also remove a source of combustion gases from your home.

*Estimated Cost/Benefits/Incentives*

A heat pump water heater uses 70% less electricity than a standard electric water heater. Depending on your income, Efficiency Maine offers a no-cost program for low-income households, or a rebate of up to $1,000 for everyone else, making the equipment cost as little as $400 plus installation. The rebate can be combined with a federal tax credit of 30% of the remaining cost. For more information, you can call Efficiency Maine at 866-376-2463 (Monday to Friday, 8:00 am to 5:00 pm) or visit their website: https://www.efficiencymaine.com/at-home/heat-pump-water-heater-program/

### 4.6 Gutters

*Problem*

The house has no gutters, so water runs off your roof and directly onto the ground next to your house. Water that splashes off the ground can damage the exterior of your house. Runoff that is absorbed into the ground can seep into the basement/crawlspace, causing moisture issues there and throughout your house.

*Recommendation*

Install gutters and downspouts that divert water at least six feet away from the foundation and to where the ground slopes away from the house.

Install gutters and downspouts that divert water at least six feet away from the foundation and to where the ground slopes away from the house.

*Estimated Cost/Benefits/Incentives*

Adding gutters would mitigate moisture damage and save you from having to replace/fix other parts of the house.

### 4.7 Bathroom exhaust fan(s)

*Problem*

Currently, there is no bathroom exhaust fan, so moisture from the shower, toilet, and sink remains in the house, which can cause moisture issues such as mold.

*Recommendation*

Bathroom exhaust fans should be rated for at least 80 cubic feet per minute (CFM) if there is a shower. We recommend Panasonic WhisperQuiet or similar fans that don’t create excess noise. They should be installed before the attic is air-sealed and insulated. The fan needs to be ducted outside, so it does not add moisture into the attic.

Bathroom exhaust fans should be rated for at least 80 cubic feet per minute (CFM) if there is a shower. We recommend Panasonic WhisperQuiet or similar fans that don’t create excess noise.

*Estimated Cost/Benefits/Incentives*

The typical fan is around $130 plus the cost of installation.

### 4.8 Kitchen exhaust fan(s)

*Problem*

Currently, there is no kitchen exhaust fan, so fumes, smoke, and moisture from cooking stay in the house which can cause health concerns.

*Recommendation*

We recommend a kitchen exhaust fan to remove harmful combustion gases from your home, which should be rated for at least 100 cubic feet per minute (CFM). A fan can also help with moisture concerns. A kitchen fan should be ducted to the outdoors. If the ductwork will run through the attic, it should be installed before the attic is air-sealed and insulated.

We recommend a kitchen exhaust fan to remove harmful combustion gases from your home, which should be rated for at least 100 cubic feet per minute (CFM). A fan can also help with moisture concerns.

*Estimated Cost/Benefits/Incentives*

Kitchen range hoods typically cost $150 or more; installation costs depend on the complexity of the exhaust ducting.

### 4.9 Solar

*Problem*

\*\* Auditor to describe (or remove this section).\*\*

*Recommendation*

Rooftop solar can supply most or all of your home electrical demands. Contact a solar company for pricing and details specific to your house.

Rooftop solar can supply most or all of your home electrical demands. Contact a solar company for pricing and details specific to your home.

*Estimated Cost/Benefits/Incentives*

There is a 30% federal tax credit and financing options are available. Battery backup is needed for solar to work during a power outage.

### 4.10 5 Additional Resources

Many home efficiency upgrades are eligible for Efficiency Maine rebates and federal tax credits. Financial incentives vary based on income level and type of occupancy. An overview of all state rebates and federal tax credits can be found here: https://www.efficiencymaine.com/at-home/

You can search for Efficiency Maine registered contractors here: https://www.efficiencymaine.com/at-home/vendor-locator/

Our Maine Energy Upgrade Program team is willing and able to help you sort out the details of incentives and recommend contractors who have done quality work.

\*\*As part of our program, we plan to coordinate with homeowners and contractors to bundle multiple projects together to reduce costs. We will also pay for barging costs for materials, contractor vehicles, and other necessary equipment to make energy upgrades. To qualify for our program, homes must install either a heat pump or heat pump water heater in addition to any other improvements.

## 5 Financing