



# Your Energy Audit

## Home

Eva Henson  
500 Bills Ranch Road  
Unit 111 Bldg. C  
Frisco, CO 80443  
(970) 406-1430  
evah@townoffrisc.oco

## Audit Date

Jan 15, 2021  
12:00 PM

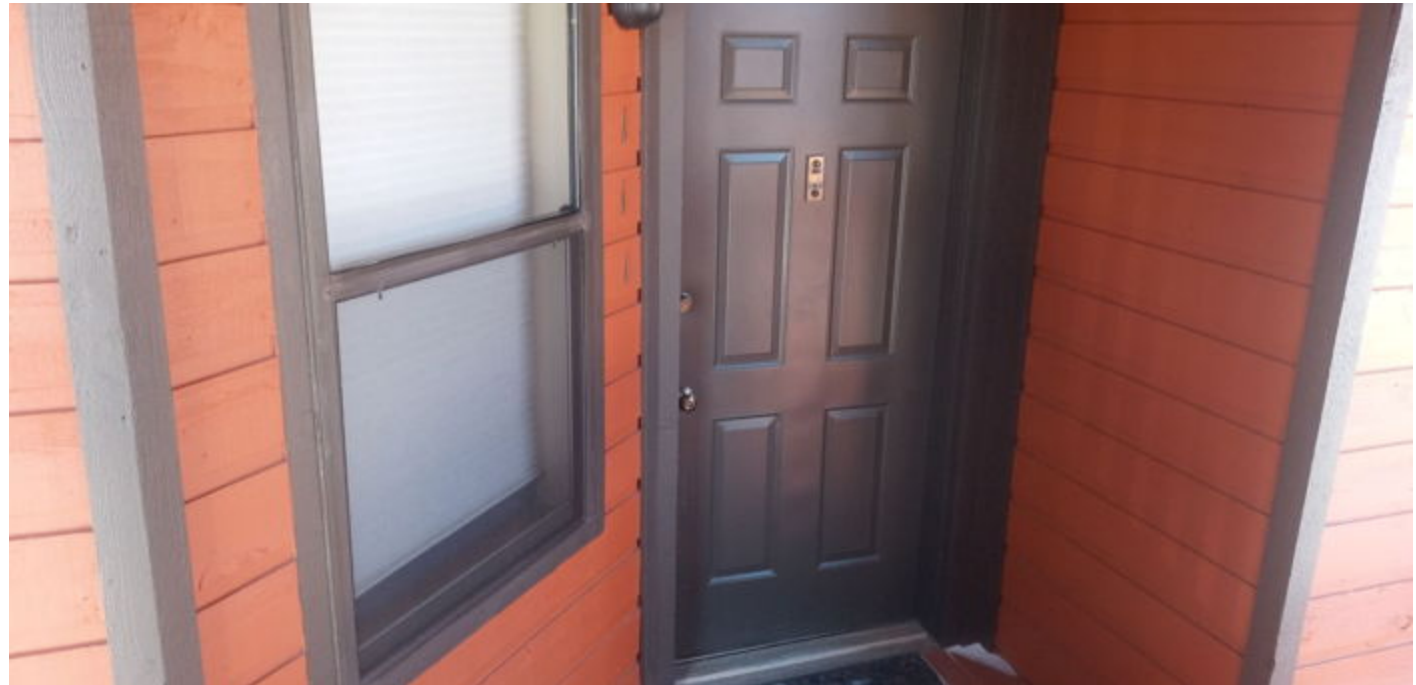
## Audited By

### Cody Jensen

Energy Programs Manager  
BPI - Building Analyst  
970.668.5703  
cody@  
highcountryconservation.org

## High Country Conservation Center

518 Main St.  
PO Box 4506  
Frisco, CO 80443  
Office (970) 668-5703  
M-F 9-5



Thank you for completing an energy audit at your home here in Frisco. Please reach out to me directly with any questions you have regarding this report. My contact info is in the left pane of this page. If you can recall, HC3 can connect you with excellent local home performance contractors to complete any projects you wish to pursue. In addition, we will help facilitate things and ensure you get paid any and all rebates due to you. The standard rebate which applies to all projects is a 50% rebate up to \$400. Additional rebates are available if you pursue more than one project outlined in this report. Thanks!

## Inside Your Report

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### We listened to you!

As our client, we want to make sure we are addressing all of your concerns for your home. If we have missed any concerns in this report, please let us know right away.

# Concerns

## General Efficiency

Homeowner expressed interest in having the home evaluated for overall efficiency of the home to prioritize potential energy improvements.

## Energy Costs

Client reports that they are experiencing high energy costs and are seeking prioritized solutions for decreasing these costs.



# Solutions for Your Home

Call us today at (970) 668-5703 to ask a question or discuss the next step!

## Totals

### Cost

\$ 6,100.00

### Estimated Savings

\$57 per year

This is an estimate of how much you could save starting in Year 1. Savings will only increase as energy prices rise over the years.

### Savings to Investment Ratio\*

For Package: 0.2

### Impact of upgrades

Energy Reduction	12%
Carbon (CO2) Savings	0 tons
Equivalent cars removed from the road	0/yr

DETAILS	INSTALLED COST	APPROXIMATE ANNUAL SAVINGS	SIR *
Insulate Frame Floor	\$ 2,500.00	\$ 12	0.1
Seal Air Leaks	\$ 600.00	\$ 15	0.4
Thermostat Set Points	\$ 500.00	\$ 5	0.2
Replace Sliding Door	\$ 2,500.00	\$ 25	0.2

\* SIR is the Savings to Investment Ratio. Simply put, if the SIR is 1 or greater, then the energy savings from the item will pay for itself before it needs to be replaced again. This metric is used to help prioritize the recommendations by financial merit.



# Insulate Frame Floor

## FRAME FLOOR

### Installed cost

\$2,500

### Energy Savings

Approx. \$12

### Savings to Investment Ratio

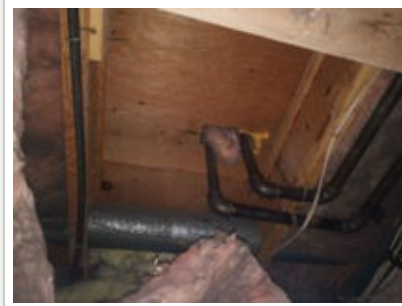
0.1

### Why it matters

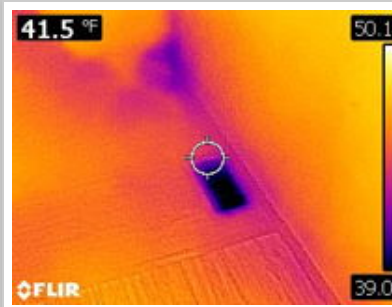
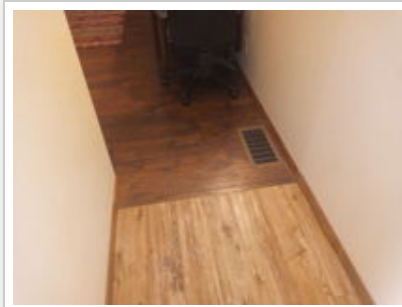
Insulating floors above the garage and cantilevers can dramatically increase the comfort of bedrooms and other living spaces. This is done by drilling holes in the ceiling of the garage or floor of the cantilever and then filling the cavity between the floor joists with blown-in insulation.



inside. As you can see on the right, the under-side of the subfloor can be seen uninsulated with plumbing running into the unit.



Any penetrations through the subfloor should be thoroughly air sealed with closed cell foam or caulk. Ideally, any exposed floor should be insulated and air sealed with 2-part closed cell spray foam.



In the unit, a cold floor register indicates cold air infiltration into the ductwork from the garage below.



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# Insulate Frame Floor

## Notes to Homeowners

Conditioned living space over an unconditioned garage poses some building science concerns. With your living space floor exposed over unconditioned air, thermal resistance between the two zones becomes an issue. Furthermore, the potentially hazardous air conditions within a garage make the separation between these two spaces critical. The first step is to stop any direct air-migration from happening between the garage and the living space above. Air will find its way into the floor system via even the smallest penetrations and holes. These are often hard to visually see as they occur around electrical boxes, outlets, switches, lights, garage openers and frames. Minimizing air-movement will ultimately help your insulation to perform at its best. The second part of this process is to upgrade the insulation within this floor system. Either drill a series of access holes in the ceiling to blow-in loose cellulose or fiberglass insulation into the joist cavities. Fill the cavities full and patch the holes to maintain an air-tight barrier. Another option is to install a two-part closed-cell polyurethane spray foam to fill the cavity while creating a thorough air-barrier. Spray foam will yield far greater thermal properties to help separate the garage from the living space above.

FRAME FLOOR

**Installed cost**  
\$2,500

**Energy Savings**  
Approx. \$12

**Savings to Investment Ratio**  
0.1

**Why it matters**

Insulating floors above the garage and cantilevers can dramatically increase the comfort of bedrooms and other living spaces. This is done by drilling holes in the ceiling of the garage or floor of the cantilever and then filling the cavity between the floor joists with blown-in insulation.

## Now & Goal

DETAILS	NOW	GOAL
<b>Frame Floor</b>		
Floor Cavity Insulation	11 R Value	19 R Value
Floor Continuous Insulation		
Modeled Floor Area	500 ft²	



# Seal Air Leaks

## AIR LEAKAGE

### Installed cost

\$600

### Energy Savings

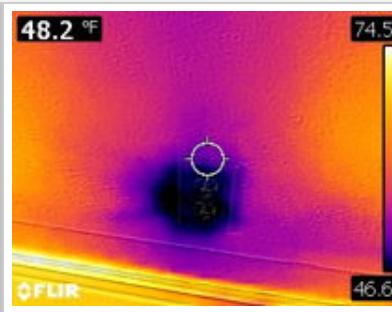
Approx. \$15

### Savings to Investment Ratio

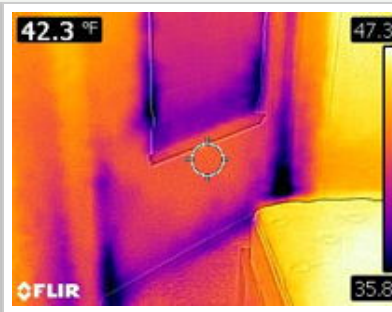
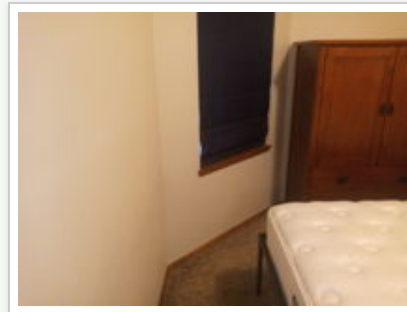
0.4

### Why it matters

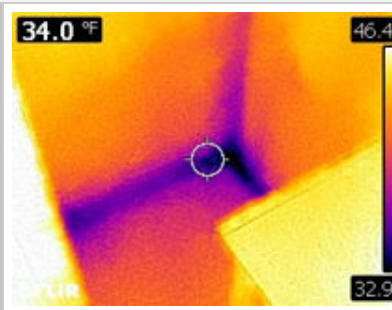
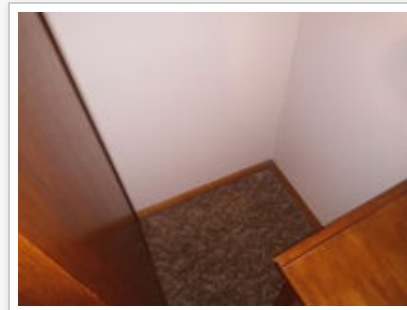
Air sealing is typically the most cost effective improvement you can make to your home. To properly seal out air leaks, a large fan called a blower door is used to depressurize your house. This makes air leaks easy to find, so corrective measures can be taken. A good air sealing job will dramatically increase the comfort of your home and help you save significant energy.



The electric switches and outlets found on the exterior walls throughout your home are air-leakage pathways, which when added up, contribute greatly to your home's overall leakage.



The baseboards throughout the home are a popular place for air-leaks to manifest. A thin bead of clear caulk can be used to seal the baseboards to the flooring, and to the drywall above.



More baseboard air-leakage manifesting from the garage below.





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## Seal Air Leaks

### AIR LEAKAGE

#### Installed cost

\$600

#### Energy Savings

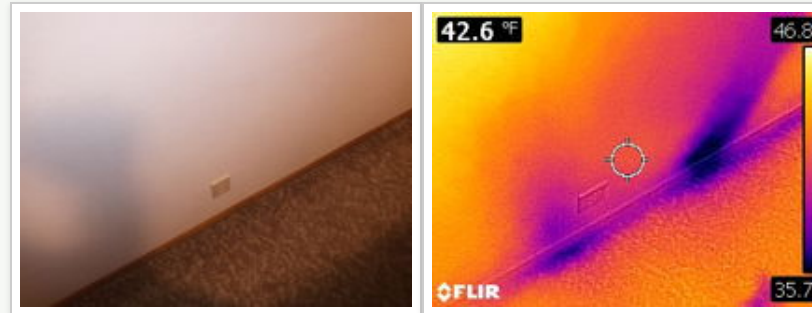
Approx. \$15

#### Savings to Investment Ratio

0.4

#### Why it matters

Air sealing is typically the most cost effective improvement you can make to your home. To properly seal out air leaks, a large fan called a blower door is used to depressurize your house. This makes air leaks easy to find, so corrective measures can be taken. A good air sealing job will dramatically increase the comfort of your home and help you save significant energy.



More baseboard air-leaks in the bedroom.

### Notes to Homeowners

In Summit County's climate zone 7, air leakage accounts for roughly 40% of a typical home's heating costs. Identifying and properly sealing these leaks leads to reduced heating costs and increased building comfort. Additionally, sealing points of air-leakage will help ensure the maximum efficiency within the building's structure. I have successfully identified several points of air-leakage within your home.

Your air leakage was measured at .73 Natural Air Changes per Hour (NACH). This means that 73% of the air in your home is exchanged every hour under natural operating conditions. This is considered fairly leaky.

Another way to look at air leakage, as you can see in the details below is ACH50. This is the number of Air Changes per Hour (ACH) the home undergoes during pressure testing (50 Pascals). For some perspective, a new home seeking to meet the current energy code has to test below 3.0 ACH50. Your home has come in at 13.57 ACH50.

Significant air leaks throughout a typical home include: basement/crawlspace rim, wall penetrations, windows, door weather stripping, wall top plates, attic accesses, outlets/switches, baseboards, fireboxes, and recessed lighting. Air leakage is the number one energy problem in most homes. Therefore, air-sealing improvements are some of the most cost effective ones you can perform. In our indoor heating climate here in Summit County, cold, unconditioned outdoor



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# Seal Air Leaks

air typically enters low in a home and escapes through points higher in the home. This is also referred to as stack effect.

## Air Leaks Attic Access:

Seal attic access hatch at the trim ledge with foam or rubber weather-stripping, and weigh down the hatch from above with a fitted sheet of 3/4" MDF to ensure an air-tight seal. Insulate the entire access panel from above with several layers of extruded polystyrene foam board cut to the same dimensions, thusly eliminating thermal bridging between the two spaces. This process is pictured above.

## Air Leaks Trim:

The trim on both entry doors especially the trim directly above the front entry door is quite leaky. Removing the trim will grant access to the door casing as well as the buildings structural framing. Working from the outermost point first, seal the larger gaps around the entirety of the door frame with minimally expanding foam. When replacing the door trim, a bead of caulk should be applied as a last layer of defense against pesky leaks. Additionally, both doors could use some attention around their built-in weather-stripping.

## Air Leaks Exterior wall penetrations:

Penetrations in exterior walls, or the thermal envelope, of the building are primary air-leakage concerns. Top and bottom plates are often very leaky and manifest as indoor leaks typically through baseboard trim. Caulk the baseboards throughout the home to the drywall and the floor wherever possible. Outlets and switches are other major leakage points that can add up to major holes in your wall. Remove covers and caulk or spray foam the junction box to the rough drywall opening. Before re-installing the cover, add a foam gasket to ensure an air-tight seal.

## Air Leaks Tongue and Groove:

The tongue and groove paneling utilized throughout the thermal envelope of the

## Notes to Contractors

### AIR LEAKAGE

#### Installed cost

\$600

#### Energy Savings

Approx. \$15

#### Savings to Investment Ratio

0.4

#### Why it matters

Air sealing is typically the most cost effective improvement you can make to your home. To properly seal out air leaks, a large fan called a blower door is used to depressurize your house. This makes air leaks easy to find, so corrective measures can be taken. A good air sealing job will dramatically increase the comfort of your home and help you save significant energy.





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# Seal Air Leaks

AIR LEAKAGE

**Installed cost**

\$600

**Energy Savings**

Approx. \$15

**Savings to Investment Ratio**

0.4

**Why it matters**

Air sealing is typically the most cost effective improvement you can make to your home. To properly seal out air leaks, a large fan called a blower door is used to depressurize your house. This makes air leaks easy to find, so corrective measures can be taken. A good air sealing job will dramatically increase the comfort of your home and help you save significant energy.

home is quite leaky. Addressing leaks at this level requires air sealing measures to be applied thoroughly at the interface between paneling throughout the field. Joints and transitions between adjacent faces are a top priority. The recessed lights under the attic are very leaky, indicating convective heat loss. The recessed lights are leaky at the mid-floor locations, indicating leaky rim joists where unconditioned outdoor air has entered the space and is convecting throughout the floor cavity. The recessed lights utilize incandescent or halogen light bulbs, adding additional heat to the drywall surface.

## Now & Goal

DETAILS	NOW	GOAL
<b>Air Leakage</b>		
Blower Door Test Performed	Tested	Estimate
Blower Door Reading	1189 CFM50	891.75 CFM50
Conditioned Air Volume	5280 ft³	
Wind Zone	2	
N-Factor	18.5	
Equivalent NACH	0.73 NACH	0.55 NACH
Effective Leakage Area	56.48 in²	42.36 in²
Equivalent ACH50	13.51 ACH50	10.13 ACH50
Kitchen Fan		
Bathroom Fan 1		
ASHRAE 62.2 Required mechanical ventilation rate	N/A CFM	N/A CFM
Minimum CFM50		496 CFM50
Mechancial Ventilation Type	None	None



# Thermostat Set Points

## THERMOSTAT

### Installed cost

\$500

### Energy Savings

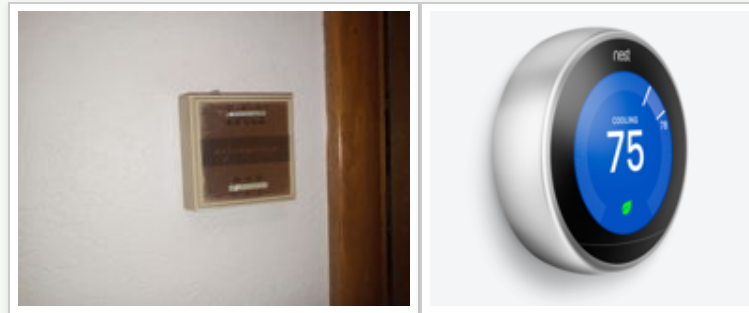
Approx. \$5

### Savings to Investment Ratio

0.2

### Why it matters

Installing a programmable thermostat (or correctly setting the one you currently have) will help you to use less energy when you're not at home or when you're sleeping.



Your thermostat pictured on the left alongside a modern Wi-Fi enabled programmable thermostat and a standard programmable thermostat below.



## Notes to Homeowners

1. Keep the temperature set at its energy savings set points for long periods of time (at least eight hours), for example, during the day, when no one is at home, and through the night, after bedtime. If you have in-floor heat provided by a boiler, long energy saving set points typically don't make sense due to the amount of time it takes for your home to heat back up to the normal set point. Each home is different, so it might take some experimenting with different times and set points to find a plan that works for you.
2. All thermostats let you temporarily make an area warmer or cooler, without erasing the pre-set programming. This override is cancelled automatically at the next program period. You use more energy (and end up paying more on energy bills) if you consistently "hold" or over-ride the pre-programmed settings.
3. Units typically have two types of hold features: (a) hold/permanent/vacation; (b) temporary. Avoid using the hold/permanent/vacation feature to manage day to day temperature settings. "Hold" or "vacation" features are best when you're



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# Thermostat Set Points

## THERMOSTAT

### Installed cost

\$500

### Energy Savings

Approx. \$5

### Savings to Investment Ratio

0.2

### Why it matters

Installing a programmable thermostat (or correctly setting the one you currently have) will help you to use less energy when you're not at home or when you're sleeping.

planning to be away for an extended period. Set this feature at a constant, efficient temperature (i.e. several degrees warmer temperature in summer when cooling, several degrees cooler during winter), when going away for the weekend or on vacation. You'll waste energy and money if you leave the "hold" feature at the comfort setting while you're away.

4. Cranking your unit up to 90 degrees or down to 40 degrees, for example, will not heat or cool your house any faster. Most thermostats begin to heat or cool at a set time, to reach set-point temperatures sometime thereafter. Units with adaptive (smart/intelligent) recovery features are an exception to this rule — Adaptive recovery units are constantly calculating the amount of time required to heat or cool the house, so that it reaches that temperature when the homeowner programmed it. By "examining" the performance of the past few days the thermostat can keep track of the seasons. In this way, your house is always at the comfort levels when occupied, but saving the most energy when unoccupied.

5. Many homes use just one thermostat to control the whole house. If your home has multiple heating or cooling zones, you'll need a programmed setback thermostat for each zone to maximize comfort, convenience and energy savings throughout the house.

6. If your programmable thermostat runs on batteries, don't forget to change the batteries each year. Some units will indicate when batteries must be changed.

## Now & Goal

DETAILS	NOW	GOAL
<b>Thermostat</b>		
Heating Setpoint High	64-72 °F	68 °F
Heating Setpoint Low	60-68 °F	62 °F
Cooling Setpoint High	76-88 °F	85 °F
Cooling Setpoint Low	72-82 °F	77 °F



# Replace Sliding Door

## DOORS

### Installed cost

\$2,500

### Energy Savings

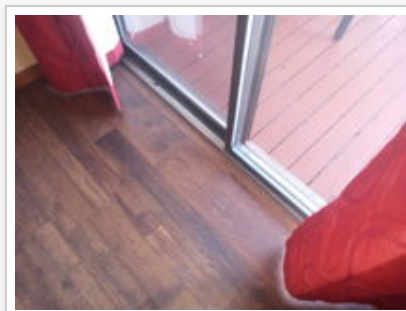
Approx. \$25

### Savings to Investment Ratio

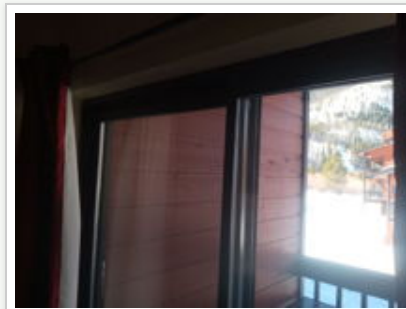
0.2

### Why it matters

Adding storm door(s) or replacing your current exterior door(s) with insulated ones will help save energy and help reduce drafts.



The exterior sliding door is a primary air-leakage point in the unit. With little exterior wall square footage within this unit, major fenestrations such as this play a larger role in the overall efficiency of the unit.



The infrared image on the right depicts a very cold sliding door.



The front exterior door is also a noticeable cold spot within the unit.



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# Replace Sliding Door

## DOORS

### Installed cost

\$2,500

### Energy Savings

Approx. \$25

### Savings to Investment Ratio

0.2

### Why it matters

Adding storm door(s) or replacing your current exterior door(s) with insulated ones will help save energy and help reduce drafts.

DETAILS	NOW	GOAL
<b>Doors</b>		
<b>Door 1</b>		
Area	21 ft <sup>2</sup>	21 ft <sup>2</sup>
ENERGY STAR	No	No
U Value	0.46 U Value	0.21 U Value
<b>Door 2</b>		
Area	21 ft <sup>2</sup>	21 ft <sup>2</sup>
ENERGY STAR	No	No
U Value	0.46 U Value	0.21 U Value



# Health & Safety

## What's This?

These tests are recommended by the Building Performance Institute (BPI). They can help identify potential health and safety concerns in your home.

## Test Summary

Ambient Carbon Monoxide	✓
Natural Condition Spillage	✓
Worst Case Depressurization	✓
Worst Case Spillage	✓
Undiluted Flue CO	✓
Draft Pressure	✓
Gas Leak	✓
Venting	✓

✓ Passed   ✗ Failed   ⚠ Warning



No gas leaks detected during visit.

## Notes to Homeowners

### What's This?

These tests are recommended by the Building Performance Institute (BPI). They can help identify potential health and safety concerns in your home.

Have a Radon test completed in your home. According to the Environmental Protection Agency, most homes in Colorado are at risk for Radon exposure due to soil conditions. According to the EPA, Radon exposure is the second leading cause of lung cancer in the U.S. Testing (or retesting) is important after you perform any air sealing modifications to your home.

Install smoke detectors and fire extinguishers throughout the home. The National Fire Protection Agency recommends replacing your smoke detectors every ten years. Test your detectors monthly and replace batteries annually. If you are uncertain of the age of your detectors, you can sometimes look them up by their serial/model numbers. If in doubt, we recommend replacement. Replacement costs are far lower than the life and property that they help protect.

Before starting any energy efficiency improvements, it is important to ensure your house is safe from dangerous pollutants such as carbon monoxide. Install and maintain a carbon monoxide detector on each level where people sleep. Install one carbon monoxide detector for every 1000 square feet of floor area, and a minimum of one on each sleeping level. Test detector(s) monthly and replace batteries annually.





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# Health & Safety

## What's This?

These tests are recommended by the Building Performance Institute (BPI). They can help identify potential health and safety concerns in your home.

## Test Summary

Ambient Carbon Monoxide	✓
Natural Condition Spillage	✓
Worst Case Depressurization	✓
Worst Case Spillage	✓
Undiluted Flue CO	✓
Draft Pressure	✓
Gas Leak	✓
Venting	✓

✓ Passed   ✗ Failed   ⚠ Warning

## Basic Carbon Monoxide (CO) Test

The CO test I performed in your home is a first step to see whether your gas fired appliances or vehicle emissions may be emitting CO into your home. This test is not conclusive.

Ambient CO test result was 0 ppm. This is a satisfactory level.

If your ambient CO level is greater than 9ppm, we recommend immediately contacting a contractor who specializes in heating and/or plumbing to clean and tune the affected system(s), including checking gas pressure(s) and venting, and adjusting as needed. Further troubleshooting beyond these steps may be needed to solve the problem.

Concentrate on sealing all cracks, holes, penetrations and doors between attached garages and conditioned spaces in the home to keep automobile exhaust from entering the home.

Consider installing an exhaust fan triggered by your garage door opener for garage exhaust venting. Briefly venting the space when exhaust is present will make the garage and house safer.

## Undiluted CO Test:

This test measures carbon monoxide levels in your combustion flue gases for your heating and water heating equipment. High levels of carbon monoxide indicates improper combustion.

The furnace CO level tested at 13 ppm. The is a satisfactory level.

The water heater CO level tested at 21 ppm. This is a satisfactory level.



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# Health & Safety

## What's This?

These tests are recommended by the Building Performance Institute (BPI). They can help identify potential health and safety concerns in your home.

## Test Summary

Ambient Carbon Monoxide	✓
Natural Condition Spillage	✓
Worst Case Depressurization	✓
Worst Case Spillage	✓
Undiluted Flue CO	✓
Draft Pressure	✓
Gas Leak	✓
Venting	✓

The Building Performance Institute recommends having your heating equipment inspected and tuned when Undiluted CO levels are measured between 26100 ppm. If the CO level is measured between 101400 ppm the Building Performance Institute requires that the problem be fixed before any energy efficiency upgrades are performed. Some boiler manufacturers have higher allowable CO ranges for safe and proper combustion.

✓ Passed   ✗ Failed   ⚠ Warning



# Install Mechanical Ventilation

## ADDITIONAL NOTES

### About this section

Additional notes are miscellaneous items that deserve a mention in your home's report. These mentioned items are not included in the cost or savings of your project.



Mechanical Ventilation can be as simple as a bath fan programmed to run continuously or on a set schedule, or as advanced as a heat or energy recovery ventilator (HRV/ERV).

## Notes to Homeowners

Modern building science suggests that we build tight and ventilate right. Today, we build homes tighter to save energy, improve durability and enhance our client's comfort. We have learned that uncontrolled air leakage wasted energy, and brought in pollutants from outdoors like pollen, dust, and mold. The benefits of a tighter home comes with the need to add mechanical ventilation to control indoor air quality and manage interior moisture. For some builders it seems strange to build a tight home and then add ventilation; why not just leave it leaky? We now realize that tight homes offer the control of comfort, efficiency and durability while offering filtered, distributed ventilation, making these homes better and healthier. When ventilation and combustion air requirements are met, you can now build a tighter home without concern.

As of 2009, continuous mechanical ventilation is required by the widely adopted International Residential Code (IRC) and the International Energy Conservation Code. Most mountain communities adopted the 2012 version in 2014. With a well-sealed, tight pressure boundary adjacent to the insulation, those insulation systems perform near their listed rating, and indoor air quality management is more effective and can save energy.

We recommend mechanical ventilation for every building, to promote great indoor air quality, but if your air leakage rate is below or may be improved to less than 35%, the need for fresh air to manage indoor air quality is much greater. Radon, Formaldehyde, Molds, Lead, and Volatile Organic Chemicals (VOCs) in building materials and furnishings, and other environmental pollutants in your home can negatively affect your health and the health of your home. Water vapor, while not a



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# Install Mechanical Ventilation

## ADDITIONAL NOTES

### About this section

Additional notes are miscellaneous items that deserve a mention in your home's report. These mentioned items are not included in the cost or savings of your project.

## Notes to Contractors

dangerous component of air, can damage building materials if condensation forms on windows or in building cavities. Water vapor, when it condenses on cold surfaces, is also a key ingredient in the formation of Mold. In addition, Carbon Monoxide is poisonous, even at low levels. Source control is the best method for ensuring good indoor air quality. Ensure that gas or solid fuel combustion appliances, such as cooking facilities, furnaces, boilers, hot water heaters and fireplaces, are serviced regularly and venting properly to the outdoors. Concentrate on sealing all cracks, holes, and penetrations in walls and doors between attached garages and conditioned spaces in the home to keep automobile exhaust from entering the home. Consider installing an exhaust fan triggered by motion or your garage door opener for garage exhaust venting. Briefly venting the space when exhaust is present will make the garage and house safer. Have a Radon test completed in your home. According to the Environmental Protection Agency, most homes in Colorado are at risk for Radon exposure due to soil conditions. According to the EPA, Radon exposure is the second-leading cause of lung cancer in the U.S. Testing (or retesting) is important after you perform any air sealing modifications to your home

If your air leakage is less than 35%, we recommend a mechanical ventilation system to improve indoor air quality. One relatively inexpensive ventilation option is to replace one or more bath fans with low-power, high quality fans that run continuously or on a timer (some use as little as 11 watts). You may also consider a heat recovery ventilator (HRV) to bring in fresh air and exhaust stale air while retaining most of the warmth or coolness from your house.



# Add Tank or Pipe Wrap

## ADDITIONAL NOTES

### About this section

Additional notes are miscellaneous items that deserve a mention in your home's report. These mentioned items are not included in the cost or savings of your project.

### Why it matters

Wrapping an existing water heater with insulation and adding insulation to the hot pipes around the water heater can help save energy and money.



During my visit I insulated the water heater to help the appliance run more efficiently and store hot water more effectively.

## Notes to Homeowners

Insulate the water heater by wrapping it in a fiberglass insulation blanket. Insulating your water heater will help retain heat, and reduce the off-demand combustion cycling frequency. Doing so will save energy and help ensure hot water is always on-demand.



# Xcel Energy Rebates



## Advising

Xcel Energy's expert Energy Advisors at CLEAResult will provide **unbiased advice and impartial guidance** on the next steps toward making your home more comfortable and less costly to operate. They can help you with applicable rebates, incentives, contractors and best practices **so you know you're making educated, smart decisions** that are right for your home.

**Call (303) 446-7910 to speak with a free, impartial Energy Advisor about your home.**

Energy Advisors are expert consultants who can:

- Provide expert advice about energy upgrades
- Help you prioritize next steps for your home energy improvements
- Connect you with qualified contractors
- Connect you with applicable rebates, financing, and incentives and help you with the paperwork
- Connect you with Xcel Energy's complementary programs, such as the Saver's Switch, Solar Rewards, and Wind Source, among others

You may receive a call from an Energy Advisor offering to review this audit with you. We look forward to working with you.

**Spots are limited, so take advantage of this service while it lasts.**

Here's what homeowners are saying about CLEAResult's Energy Advisors:

// Thank you for all of your thoroughness and assistance throughout.

// [My advisor was] very professional, knowledgeable, and extremely helpful.

// [My advisor] was fantastic! She was super helpful, answered all of my questions, and was very prompt responding to emails.

**Call to speak with an Energy Advisor: (303) 446-7910 [xcelenergyadvisors@clearesult.com](mailto:xcelenergyadvisors@clearesult.com)**
















# Xcel Energy Rebates



## 2020 Rebate Summary: COLORADO RESIDENTIAL ENERGY EFFICIENCY PROGRAMS

Based on the Xcel Energy air tightness calculation, your home may qualify for air-sealing rebates.

Check with your local jurisdiction for additional rebates, financing, and incentives you may qualify for beyond the stated Utility Rebates. Rebates and incentives are not guaranteed. Programs are subject to change. Rebates subject to change under pending PUC filings. Current information is located at [xcelenergy.com/HomeRebates](http://xcelenergy.com/HomeRebates).













	Rebate area	Qualifiers	Rebate	More information	
Key	Cooling				
	Evaporative coolers	Standard cooler	\$300	Rebate can't be more than total cost.	
		Premium cooler	\$675	<sup>1</sup> Premium unit with 3 ducts or more, and at least one of them new, is needed to qualify for the \$1,200 rebate.	
		Multi-ducted premium cooler <sup>1</sup>	\$1,200		
	Standard efficiency AC/ASHP with Quality Installation (QI)	Under 15 SEER and 12.5 EER	\$300	The rebate is paid according to the lesser value of the SEER/ EER. Example: A system with 16 SEER and 12 EER will receive a \$300 rebate.  New, matched indoor and outdoor components, a TXV, and an AHRI certificate are required.	
	High efficiency AC/ASHP with Quality Installation (QI)	15+ SEER and 12.5+ EER	\$500	<b>SEER</b> = Seasonal Energy Efficiency Ratio <b>EER</b> = Energy Efficiency Ratio <b>AC</b> = Air Conditioner <b>ASHP</b> = Air Source Heat Pump <b>AHRI</b> = Air-conditioning, Heating, and Refrigeration	
	Mini-split heat pumps	15+ SEER, 11+EER, 9+ HSPF	\$300	AHRI certificate required. <b>HSPF</b> = Heating Seasonal Performance Factor	
	Ground source heat pumps	Minimum 3.3 COP and 14.1 EER	\$300 per heating ton	ENERGY STAR® qualified, closed-loop systems. AHRI certificate required. <b>COP</b> = Coefficient of Performance	
Key	Heating				
	Furnaces	95% AFUE	\$300	Only new furnaces located on <b>ahridirectory.org</b> qualify for a rebate. <b>AFUE</b> = Annual Fuel Utilization Efficiency	
Key	Water heating				
	Storage tank (medium draw)	0.64 UEF	\$50	Only new equipment located on <b>energystar.gov</b> or <b>ahridirectory.org</b> qualifies for a rebate. <b>UEF</b> = Uniform Energy Factor	
	Storage tank (high draw)	0.68 UEF	\$50		
	Tankless	0.87 UEF	\$100		
	Electric heat pump	\$400			
	CTA-2045 Electric heat pump Rebate	\$500			
	Rebate area		Qualifiers and associated rebates		
Key	Air sealing and insulation				
			Natural gas heating, no AC cooling	Natural gas heating with AC cooling	Electric resistance heating
	Air sealing, bypass sealing, weather stripping (60% up to cap)	20% leakage reduction	\$100	\$130	\$100
		30% leakage reduction	\$150	\$300	\$300
	Attic insulation (30% up to cap)		\$350	\$500	\$300
	External wall insulation, above grade (30% up to cap)		\$300	\$500	\$150

\*Please see key on next page.



# Xcel Energy Rebates

## 2020 Xcel Energy Rebate Summary Continued...


	Rebate area	Rebate	More information	
Key	Home energy audit			
  	Infrared audit	\$200	60% of the cost, up to \$200	
  	Blower door audit	\$160	60% of the cost, up to \$160	
  	Standard audit	\$100	60% of the cost, up to \$100	
Key	Home performance with ENERGY STAR®			
  	Begin with a blower door audit, infrared audit, or a Home Energy Squad Plus visit to be eligible to sign up. Then if the customer installs three or more qualifying measures, the customer will receive an additional one-time bonus rebate of 10% of the prescriptive rebate amount for each measure completed within the two-year time period. Qualifying measures <sup>1</sup> are listed below.			
Rebate area		Qualifiers and associated rebates		
Air sealing and insulation				
		Natural gas heating, no AC cooling	Natural gas heating with AC cooling	Electric resistance heating
Air sealing, bypass sealing, weather stripping (60% up to cap)	20% leakage reduction	\$100	\$130	\$100
	30% leakage reduction	\$150	\$300	\$300
Attic insulation (30% up to cap)		\$350	\$500	\$300
External wall insulation, above grade (30% up to cap)		\$300	\$500	\$150
Rebate area		Rebate		
Home improvement measures				
Evaporative cooler - Premium system		\$675		
Standard efficiency AC/ASHP with QI (under 15 SEER and 12.5 EER)		\$300		
High efficiency AC/ASHP with QI (15+ SEER, 12.5+ EER)		\$500		
Ground source heat pump		\$300 per heating ton		
Furnace (95% AFUE or higher)		\$300		
Electric heat pump water heater		\$500		
Natural gas tankless water heater (0.87 UEF)		\$100		
ENERGY STAR clothes washer		\$30		
ENERGY STAR clothes dryer		\$30		
ENERGY STAR smart thermostat <sup>2</sup>		\$50		


<sup>1</sup> Qualifying measures are subject to change. Customers must participate under current program rules which are designated by the year in which the installation of additional measures took place.

<sup>2</sup> To qualify for the ENERGY STAR connected smart thermostat rebate, the device must be compatible with the company's Residential Demand Response program requirements.

### KEY:

 **Natural Gas:** This symbol indicates a program available to our natural gas customers.

 **Electric:** This symbol indicates a program available to our electric customers.

 **Participating contractor:** This symbol indicates a program that requires customers to use an Xcel Energy participating contractor to install the equipment or make the improvement. Our list of registered contractors can be found at [xcelenergy.com/COTrades](https://xcelenergy.com/COTrades).



About the metrics

These metrics are for the whole house in a pre and post-retrofit state.

The 'Baseline' savings numbers will likely not be the same as the actual energy consumption of the home. These numbers are weather normalized and then projected based on the 30 year weather normals data from NOAA. In other words, this is the modeled energy consumption of the home for a typical year, not the year that the utility bills were from.

Metrics

FUELS	BASELINE	IMPROVED	SAVED
Total Fuel Energy Usage <small>therms/year</small>	498	428	70
Natural Gas Energy Usage <small>therms/year</small>	498	428	70

METRIC	BASELINE	IMPROVED	SAVED
Electric Energy Usage <small>kWh/year</small>	3,214	3,183	31
Total Energy Usage <small>MMBtu/year</small>	61.00	54.00	7.00
Fuel Energy Cost <small>\$/year</small>	\$ 378	\$ 325	\$ 53
Electric Energy Cost <small>\$/year</small>	\$ 386	\$ 382	\$ 4
Total Energy Cost <small>\$/year</small>	\$ 764	\$ 707	\$ 57
CO2 Production <small>Tons/year</small>	4.6	4.2	0.4
Payback <small>years</small>			0
Total Energy Savings			12%
Total Carbon Savings			9%
Net Savings to Investment Ratio <small>SIR</small>			0.2
Net Annualized Return <small>MIRR</small>			-4.0%

HEATING & COOLING LOAD CALCULATIONS		
Heating Load <small>Btu/hr</small>	Base: 17,365	Improved: 14,804
Cooling Load: Sensible <small>Btu/hr</small>	Base: 8,542	Improved: 8,587
Cooling Load: Latent <small>Btu/hr</small>	Base: 400	Improved: 400
Winter Design Temperature	Outdoor: 0°	Indoor: 70°
Summer Design Temperature	Outdoor: 73°	Indoor: 75°



# Tech Specs

## Property Details

Year Built:	1990
Conditioned Area:	660 ft²
Area Includes Basement:	No
Average Wall Height:	8 ft
House Length:	34 ft
House Width:	19 ft
Floors Above Grade:	1
Number of Occupants:	1
Number of Bedrooms:	1
Number of Units:	16
Type of Home:	Apartment
Front of Building Orientation:	East
Shielding:	Normal
Tuck Under Garage:	Yes
Garage Size:	2-car

## Thermostat

Programmable Thermostat Installed:	No
Heating Setpoint High:	64-72 °F
Heating Setpoint Low:	60-68 °F
Cooling Setpoint High:	76-88 °F
Cooling Setpoint Low:	72-82 °F

## Heating & Cooling

Heating Design Load:	17365 Btu/hr
<b>Hvac: 1</b>	
System Name:	Hvac System 1
Equipment Type:	Furnace with standalone ducts
Upgrade action:	Keep an existing system as is
Heating Energy Source:	Natural Gas

% of Total Heating Load:	100%
Heating Capacity:	60000 BTU/h
Heating System Efficiency:	72 AFUE
Duct Location:	Intentionally Conditioned Space
Duct Insulation:	No Insulation
Duct Leakage:	15% - Somewhat leaky
Duct Efficiency:	100%

## Appliances

<b>Range: 1</b>	
Range Fuel Type:	Electricity
<b>Oven: 1</b>	
Oven Fuel Type:	Electricity
<b>Clothes Dryer: 1</b>	
Dryer Fuel Type:	Electricity

## Clothes Washer

Type:	No Clothes Washer
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## Dishwasher

Dishwasher Installed?:	Yes
Energy Factor:	0.43 EF
ENERGY STAR:	No

## Refrigerators

<b>Refrigerator: 1</b>	
Name:	Refrigerator 1
Refrigerator Age:	0-14
Refrigerator Size:	19-21
ENERGY STAR:	No
Usage:	586.8 kWh/yr

## Lighting

% CFLs or LEDs:	76-99%
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Total # of Light Bulbs:	11
# of CFLs:	10
# of LEDs:	0
# of Incandescents:	1

## Doors

<b>Door: 1</b>	
Type:	Wood
Area:	21 ft²
ENERGY STAR:	No
U Value:	0.46 U Value
<b>Door: 2</b>	
Type:	Wood
Area:	21 ft²
ENERGY STAR:	No
U Value:	0.46 U Value

## Exterior Walls

Shared Walls North (Right):	100%
Shared Walls South (Left):	100%
<b>Wall: 1</b>	
Modeled Area:	548.23 ft²
Insulated?:	Yes
Siding:	Wood/Fiber Cement siding
Construction:	2x6 Frame
Cavity Insulation:	20.9 R Value
Continuous Insulation:	0 R Value

## Attic & Vaulted Ceiling

% of Ceilings Shared:	100%
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## Foundation - General

Foundation: Basement:	100%
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# Tech Specs

Foundation: Crawlspace:	0%
Foundation: Slab:	0%
% of Floors Shared:	0%
Foundation Above Grade Height:	1 ft

## Foundation - Basement

Modeled Basement Floor Area:	160 ft <sup>2</sup>
Basement Wall Insulation:	None or Bare Walls
Basement Rim Joist Treatment:	Same as Basement Wall
Basement Heating:	Intentional w/ continuous circulation
Basement Cooling:	None or Undesired Incidental

## Frame Floors

Modeled Floor Area:	500 ft <sup>2</sup>
Floor Cavity Insulation:	11 R Value
Floor Continuous Insulation:	0 R Value

## Windows

### Window: 1

Window Area: North (Right):	0 ft <sup>2</sup>
Window Area: East (Front):	54.82 ft <sup>2</sup>
Window Area: South (Left):	0 ft <sup>2</sup>
Window Area: West (Back):	82.23 ft <sup>2</sup>
Type:	Double pane
Frame:	Wood or metal clad
ENERGY STAR:	No
U-Value:	0.51 U Value
Solar Heat Gain Coefficient:	0.56 SHGC
Exterior Treatment: North (Right):	No Treatment
Exterior Treatment: East (Front):	No Treatment
Exterior Treatment: South (Left):	No Treatment
Exterior Treatment: West (Back):	No Treatment

## Air Leakage

Blower Door Test Performed:	Tested
Blower Door Reading:	1189 CFM50
Conditioned Air Volume:	5280 ft <sup>3</sup>
Wind Zone:	2
N-Factor:	18.5
Equivalent NACH:	0.73 NACH
Effective Leakage Area:	56.48 in <sup>2</sup>
Equivalent ACH50:	13.51 ACH50
Kitchen Fan:	0 CFM
Bathroom Fan 1:	0 CFM
ASHRAE 62.2 Required mechanical ventilation rate:	N/A CFM
Mechanical Ventilation Type:	None

## Water Heating

### Water Heating: 1

Fuel:	Natural Gas
Type:	Tank Water Heater
Age:	6-10
Location:	Indoors and within heated area
Temperature Settings:	Medium (130-140 F)
Energy Factor:	58 EF

## Pool & Hot Tub

Pool:	No
Hot Tub:	No

## PV

### Pv: 1

Has PV?:	No
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## Utility Bills

### Electric

Electric Utility Provider Name	xcel energy
Electric Account Number	53-9451044-6

## Fuel

Fuel Utility Provider Name	xcel energy
Fuel Account Number	53-9451044-6

## Contact Information

Cody Jensen  
Energy Programs Manager  
High Country Conservation Center  
BPI - Building Analyst  
518 Main St.  
PO Box 4506  
Frisco, CO 80443  
cody@highcountryconservation.org

## About This Report

Report Date: January 26, 2021  
Job ID: 180663  
Xcel Energy  
Report & modeling software: Snugg Pro™ 5.0



# Glossary

**Annual Fuel Utilization Efficiency (AFUE)** The measure of seasonal or annual efficiency of a residential heating furnace or boiler. It takes into account the cyclic on/off operation and associated energy losses of the heating unit as it responds to changes in the load, which in turn is affected by changes in weather and occupant controls.

**Annualized Return** The return an investment provides over a period of time, expressed as a time-weighted annual percentage. This is the equivalent annual interest rate you would get if you put the same amount of money spent on the energy upgrade into a savings account.

**Asbestos** Asbestos is a mineral fiber that has been used commonly in a variety of building construction materials for insulation and as a fire-retardant, but is no longer used in homes. When asbestos-containing materials are damaged or disturbed by repair, remodeling or demolition activities, microscopic fibers become airborne and can be inhaled into the lungs, where they can cause significant health problems.

**British Thermal Unit (Btu)** The amount of heat required to raise the temperature of one pound of water one degree Fahrenheit; equal to 252 calories.

**Carbon Monoxide (CO)** A colorless, odorless but poisonous combustible gas with the formula CO. Carbon monoxide is produced in the incomplete combustion of carbon and carbon compounds such as fossil fuels (i.e. coal, petroleum) and their products (e.g. liquefied petroleum gas, gasoline), and biomass.

**Cashflow** When financing energy efficiency improvements, cashflow is the difference between the average monthly energy savings and the monthly loan payment.

**Combustion Appliance Zone (CAZ)** A contiguous air volume within a building that contains a combustion appliance such as furnaces, boilers, and water heaters; the zone may include, but is not limited to, a mechanical closet, mechanical room, or the main body of a house, as applicable.

**Compact Fluorescent Light bulb (CFL)** A smaller version of standard fluorescent lamps which can directly replace standard incandescent lights. These highly efficient lights consist of a gas filled tube, and a magnetic or electronic ballast.

**Cubic Feet per Minute (CFM)** A measurement of airflow that indicates how many cubic feet of air pass by a stationary point in one minute.

**Carbon Dioxide (CO<sub>2</sub>)** A colorless, odorless noncombustible gas that is present in the atmosphere. It is formed by the combustion of carbon and carbon compounds (such as fossil fuels and biomass). It acts as a greenhouse gas which plays a major role in global warming and climate change.

**Energy Efficiency Ratio (EER)** The measure of the energy efficiency of room air conditioners: cooling capacity in Btu/hr divided by the watts consumed at a specific outdoor temperature.

**Energy Factor (EF)** The measure of efficiency for a variety of appliances. For water heaters, the energy factor is based on three factors: 1) the recovery efficiency, or how efficiently the heat from the energy source is transferred to the water; 2) stand-by losses, or the percentage of heat lost per hour from the stored water compared to the content of the water; and 3) cycling losses. For dishwashers, the energy factor is the number of cycles per kWh of input power. For clothes washers, the energy factor is the cubic foot capacity per kWh of input power per cycle. For clothes dryers, the energy factor is the number of pounds of clothes dried per kWh of power consumed.

**Heating Seasonal Performance Factor (HSPF)** The measure of seasonal efficiency of a heat pump operating in the heating mode. It takes into account the variations in temperature that can occur within a season and is the average number of Btu of heat delivered for every watt-hour of electricity used.

**Heat Recovery Ventilator (HRV) / Energy Recovery Ventilator (ERV)**

A device that captures the heat or energy from the exhaust air from a building and transfers it to the supply/fresh air entering the building to preheat the air and increase overall heating efficiency while providing consistent fresh air.

**Light Emitting Diode (LED) Lighting** An extremely efficient semiconductor light source. LEDs present many advantages over incandescent light sources including lower energy consumption, longer lifetime, improved physical robustness, and smaller size.

**Modified Internal Rate of Return (MIRR)** This is your return on investment. Roughly speaking, if you invested the same amount of money for this project (listed on this report as the total cost) into a bank account, your equivalent interest rate from all of the energy savings would be the MIRR.

**N-Factor** A factor of how susceptible your house is to wind, influenced by weather patterns, location, and the number of floors in the home. Used in the calculation of NACH.

**Natural Air Changes per Hour (NACH)** The number of times in one hour the entire volume of air inside the building leaks to the outside naturally.

**Payback Period** The amount of time required before the savings resulting from your system equal the system cost.

**R-Value** A measure of the capacity of a material to resist heat transfer. The R-Value is the reciprocal of the conductivity of a material (U-Value). The larger the R-Value of a material, the greater its insulating properties.

**Radon** A naturally occurring radioactive gas found in the U.S. in nearly all types of soil, rock, and water. It can migrate into most buildings. Studies have linked high concentrations of radon to lung cancer.

**Rim Joist** In the framing of a deck or building, a rim joist is the final joist that caps the end of the row of joists that support a floor or ceiling. A rim joist makes up the end of the box that comprises the floor system.

**Seasonal Energy Efficiency Ratio (SEER)** A measure of seasonal or annual efficiency of a central air conditioner or air conditioning heat pump. It takes into account the variations in temperature that can occur within a season and is the average number of Btu of cooling delivered for every watt-hour of electricity used by the heat pump over a cooling season.

**Savings to Investment Ratio (SIR)** A ratio used to determine whether a project that aims to save money in the future is worth doing. The ratio compares the investment that is put in now with the amount of savings from the project.