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EnergySmart COLORADO

YOUR LOCAL ENERGY EFFICIENCY PARTNERS

Home Energy Assessment

Your Energy Smart Analyst:
Charles Cady
(970) 379-2961

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Welcome to Energy Smart!

You have taken the first step to improving the comfort, safety, and efficiency of your home. The following report details the findings from the Home Energy Assessment on February 25, 2022.
Call your local Energy Smart Colorado Resource Center with any questions or to discover available rebates that can help make these recommendations a reality.

Assessment overview:

Chalet style home in Aspens west end. The owner is planning a renovation with efficiency upgrades in mind. Currently in the planning stage. The assessment was completed as a beginning baseline. Air sealing would be a huge improvement.

Building type: **Single Family**
Year built: **1956**
Square footage: **1,536**
Primary heating fuel: **Natural Gas**
Number of bedrooms: **3**
Number of occupants: **2**

Woodruff Residence
312 West Hyman, Aspen, CO 81611 Pitkin
jeffrey@cloudhilldesign.com
(970) 452-9008

Your utility provider(s):

The City Of Aspen

Black Hills Energy
Improving life with energy

Energy Usage

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Electric utility provider:
City of Aspen Electric
Electric account #: **012503656000**
Electricity cost per kWh: **$0.11**
Annual electric usage: **0 kWh**
Annual electric cost: **$0**

Gas utility provider:
Black Hills Energy
Gas account #: **3604100130**
Gas cost per Therm: **$0.85**
Annual gas usage: **0 Therms**
Annual gas cost: **$0**

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Recommended Upgrades

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When your Analyst performed your Home Energy Assessment, information was collected to estimate annual energy savings on projects you might consider completing to save money on your energy bills. Below is a breakdown of those suggested improvements, the estimated costs and potential annual savings, which were calculated through software modeling. A Savings to Investment Ratio (SIR) of 1 or greater means that the resulting energy savings will pay for the cost of the project.

Energy Detail (estimated)	Existing Home	Improved Home	Units
Annual energy consumption	114.3	77.3	MMBTU
Annual electrical consumption	4,001	3,928	kWh
Annual gas consumption	1,007	639	THERMS
Potential PV system size to offset annual electric usage (estimated)	2.9	2.8	KW

Recommended Improvement	Estimated Cost	Estimated Annual Savings	SIR
Increase wall insulation to save energy and increase comfort.	$0	$84	
Replace incandescent lights with CFLs or LEDs to save energy and replacement costs.	$5	$5	6.4
Increase attic insulation and coverage to save energy and increase comfort.	$1,206	$59	1.0
Insulate your slab to save energy and increase comfort.	$2,895	$51	0.4
Add storm windows or install new windows to save energy and increase comfort.	$5,571	$89	0.3

Air Leakage

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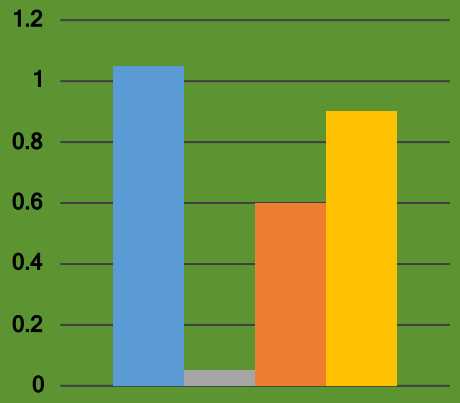
Cubic volume: **11,520CF**
Blower door flow rate: **2,972CFM50**



Natural Air Changes per Hour (ACHn)

Your Home Tight Home
Average Home Leaky Home

CF = Cubic Feet. The volume of air contained in a 1' x 1' x 1' cube.
CFM50 = Cubic Feet per Minute at 50 Pascals negative pressure. This number estimates how much air your home loses each hour.
ACHn = Natural Air Changes per Hour. Expressed in the chart above as 1.05, this means that about 105.00 % of the air in your home is lost to the outside every hour.

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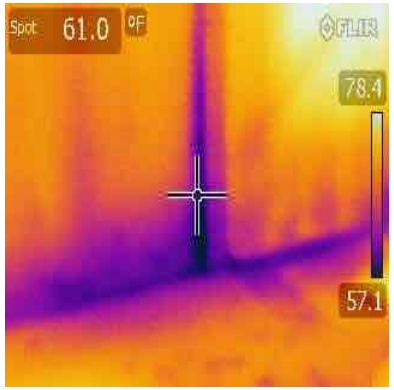
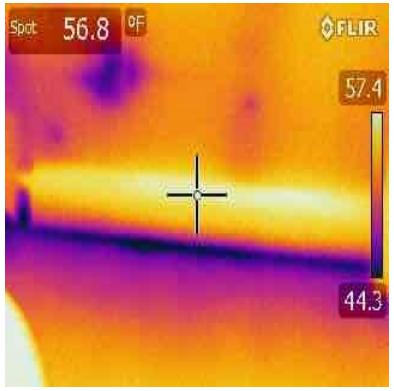
Energy Smart Tip:

Your analyst used a blower door fan to test for air leakage. This test helps determine how leaky or tight the home is relative to other homes. Your home's natural leakage rate is shown in the chart on the left. A very leaky home costs more to heat, while a very tight home may require continuous mechanical ventilation. Leaks can be repaired through attic floor sealing, caulking, weather stripping, and other means.



Infiltration at the upper level door.



Infiltration at the sill plate .

Blower door set up for the pressure test.

Recommendations:

Air infiltration observed at exterior doors, attic access, windows and trim, switches, outlets and sill plates.
Exterior doors need new weatherstripping to replace the old.
The attic access should be weatherstripped to keep out unwanted attic air.
Windows and trim should be caulked to seal. Window replacement would be optimum.
Switches and outlets can be sealed with gaskets and caulk to reduce infiltration.
Sills and baseboards need to be caulked also.

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Envelope – Windows & Doors

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Existing window type:
1-pane, wood/vinyl frame

Recommended window type:
2-pane, al. clad/wood, Low-e

Square footage (sf) of windows:
- Front: **60sf**
- Right: **49sf**
- Back: **53sf**
- Left: **24sf**

U-factor – This number refers to the ability of your windows to resist heat loss. It is the numerical reciprocal of R-value.
Low-e – These coatings are applied to glass when windows are manufactured and help to reduce the window's emissivity, which can improve insulating properties when properly applied.
Gas filled – Noble gasses are used as an air barrier between panes of glass to help increase a window's thermal performance. The seals that keep these gasses trapped inside can fail over time and should be inspected periodically.

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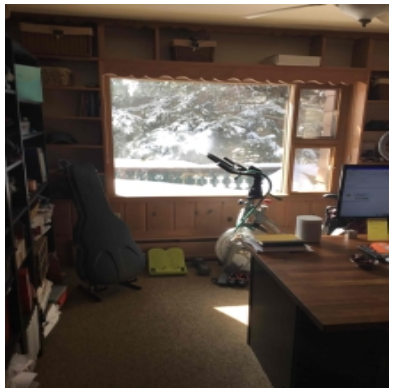
Energy Smart Tip:

Adding storm windows, insulating blinds or replacing your current windows can save energy and make your home feel more comfortable. When replacing windows, install energy efficient units with a U-factor of .28 or lower and ensure that the rough opening of the window is properly air-sealed with a low-expanding foam that is approved for doors and windows.

Single pane window with signs of deterioration .

Double pane replacement doors with broken seals.



Large expanses of single pane glass .

Recommendations:

Single pane windows are quite inefficient. Currently the windows have insulating shades and most have plastic window kits. Replacement would be optimum.

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Heating & Cooling

Your Energy Smart Analyst:
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Heating system type:
Boiler-Baseboard
Fuel: **Natural Gas**
Efficiency rating (AFUE): **92**
Recommended AFUE:

Secondary heating system:

Cooling system type:
None
Efficiency rating (SEER):
Recommended SEER:

Fireplace type: **Wood**

AFUE – Annual Fuel Utilization Efficiency is the measure of your heating system's efficiency. Higher numbers are more energy efficient.
SEER – Seasonal Energy Efficiency Ratio is the measure of your cooling system's efficiency. Higher numbers are more energy efficient.

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Energy Smart Tip:

Your home's heating and cooling systems were inspected for safety and efficiency. Older heating systems should be replaced with energy efficient, sealed-combustion units or highly energy efficient heat pumps. This is often a significant upgrade so considerations beyond energy savings should be made. ENERGY STAR certified equipment will provide the best efficiency and savings.

Sealed combustion gas boiler

Uninsulated heat pipes

Recommendations:

All exposed heat pipes should be insulated to reduce heat loss.

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Water Heating

Your Energy Smart Analyst:
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Hot water system type:
Indirect
Fuel: **Natural Gas**
Set temperature: **120**
Solar thermal assist: **N/A**
Pipes insulated?: **No**
Existing EF:
Recommended EF:

EF – Energy Factor is a metric used to compare the energy conversion efficiency of residential appliances and equipment. EF ratings vary by appliance size and type, but in general, bigger numbers are more energy efficient.

Energy Smart Tip:

Many water heating systems are set to temperatures that are too high for safety and energy efficiency. Keep your water temperature at 120˚F for optimum energy performance and to keep your family safe.

Sidearm DHW tank with uninsulated pipes .

Recommendations:

All exposed hot water pipes should be insulated to reduce heat loss.

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Lighting & Appliances

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YOUR LOCAL ENERGY EFFICIENCY PARTNERS

Total # of lamps (bulbs): **32**

Incandescent or halogen lamps: **1**
LED or CFL lamps: **25**
Florescent tubes: **6**

Refrigerator ENERGY STAR: **No**
kWh usage per year: **583**

Second fridge ENERGY STAR: **No**
kWh usage per year:

Freezer ENERGY STAR: **No**
kWh usage per year:

Dishwasher ENERGY STAR:**No**

Clothes washer ENERGY STAR: **Yes**

Tips to reduce kWh base-load:
1) Use smart power strips for big energy users like home entertainment systems
2) Use laptop computers instead of big towers – they use up to 90% less power
3) Upgrade all of your appliances as they age to ENERGY STAR

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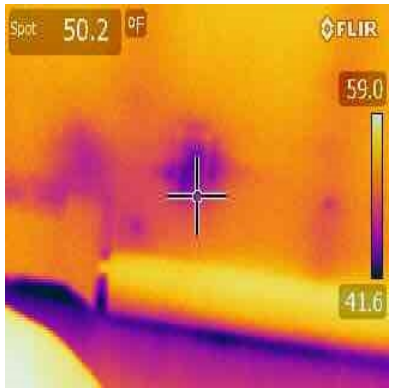
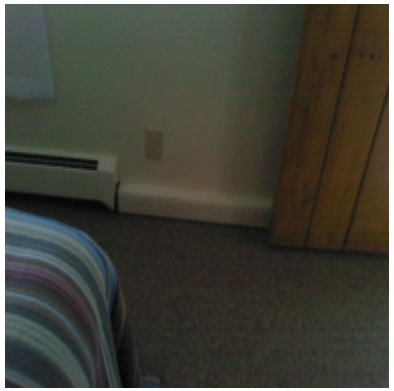
Energy Smart Tip:

Replace incandescent and CFL lamps with LEDs. LEDs use about 20% of the energy and last up to 25 times longer than traditional incandescent bulbs. They also contain no toxic mercury and turn on instantly. Your refrigerator is usually one of the biggest consumers of electricity in your home. If your fridge is more than 10 years old, consider replacing it with an ENERGY STAR certified unit.

Seldom used wood fireplace .



Infiltration at a wall outlet.



See photo at left.

Recommendations:

When purchasing appliances choose ENERGY STAR models to reduce energy and water consumption.
See air sealing recommendations

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Direct Installs

The following energy-saving items were installed during the assessment:

Quick Fix installed	Quantity	Cost
Bath aerators:	0	$0.00
DHW blankets:	0	$0.00
Kitchen aerators:	0	$0.00
LED bulbs:	0	$0.00
Pipe wrap:	0	$0.00
Showerheads:	0	$0.00
Thermostats:	0	$0.00
Weatherstripping:	0	$0.00
Thermostat setback:	0	$0.00
DHW setback:	0	$0.00
TOTAL		$0.00
QF Annual Savings	**$**	$0.00
QF Annual Savings	**kWh**	0
QF Annual Savings	**Therm**	0

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Costs, Loans and Rebates

RENU colorado residential energy upgrade loan

1. The Colorado Residential Energy Upgrade Loan (RENU) loan program is a statewide residential loan program sponsored by the Colorado Energy Office in partnership with Elevations Credit Union. It makes home energy upgrades easy and affordable by offering low-cost, long-term financing for energy efficiency and renewable energy improvements.

2. Your electric utility provider is City of Aspen Electric

   Click for electric rebates

THE CITY OF ASPEN

   Your gas utility provider is Black Hills Energy

   Click here for gas rebates

Black Hills Energy

3. Energy Smart Colorado may also have local rebates available for your community. **Click here for more info**

Your assessment invoice					
Assessment costs:		**Partner contributions:**		**Your costs:**	
Base cost	$400.00	Electric utility copay	$0.00	Your base cost	$100.00
Additional costs	$0.00	Gas utility copay		Additional costs	$0.00
Quick Fix total	$0.00	Energy Smart incentive	$300.00	Additional Quick Fixes	$0.00
				Program discount	$0.00
Assessment total	**$400.00**	**Analyst payment**	**$300.00**	**Your total**	**$100.00**

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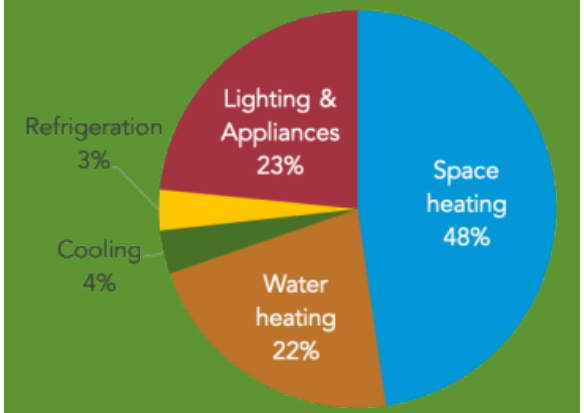
Energy Advising

We're here to help!

How do our homes use energy?



Heating our homes accounts for the biggest portion of utility bills in our cold climate. *Source: U.S. Energy Information Administration, 2015 Residential Energy Consumption Survey.*

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Have Questions?

Energy Advisors at your local Energy Smart Colorado **Energy Resource Center (ERC)** can provide unbiased advice 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 decisions that are right for **your** home.

Our 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
- Assist you with applicable rebates and financing, and help you with the paperwork
- Connect you with your utility provider's incentive programs

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

Call to speak with an
Energy Smart Colorado Energy Advisor:
(970) 925-9775
(This is a free service!)

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Your Home Summary

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Metric	Value	Metric	Value	Metric	Value
Building Type:	Single Family	Primary Roof:	Unconditioned Attic	Combustion Zone Location:	Conditioned Space
Year Built:	1956	Construction:	Wood Frame	Ambient CO:	
Square Footage:	1,536	Exterior Finish:	Composition Shingles	*Primary Heating Appliance*	
Primary Heating Fuel:	Natural Gas	Percentage of Total:	100%	Worst Case Spillage:	
Number of Bedrooms:	3	Existing R-Value:	11	Worst Case Flue CO Air Free:	
Number of Occupants:	2	Recommended R-Value:	49	Natural Conditions Spillage:	
Electric Utility Provider:	City of Aspen Electric	Secondary Roof:		Natural Conditions Flue CO Air Free:	
Account #:	012503656000	Construction:		*Hot Water Heating Appliance*	
Electricity Cost per kWh:	$0.11	Exterior Finish:		Worst Case Spillage:	
Annual Electric Usage (kWh):	0	Percentage of Total:	%	Worst Case Flue CO Air Free:	
Annual Electric Cost:	$0	Existing R-Value:		Natural Conditions Spillage:	
Gas Utility Provider:	Black Hills Energy	Recommended R-Value:		Natural Conditions Flue CO Air Free:	
Account #:	3604100130	Existing Window Type:	1-pane, wood/vinyl frame	*Secondary Heating Appliance*	
Gas Cost per Therm:	$0.85	Recommended Window Type:	2-pane, al. clad/wood, Low-e	Worst Case Spillage:	
Annual Gas Usage (Therms):	0	Front Window (sf):	60	Worst Case Flue CO Air Free:	
Annual Gas Cost:	$0	Right Window (sf):	49	Natural Conditions Spillage:	
Cubic Volume (cf):	11,520	Back Window (sf):	53	Natural Conditions Flue CO Air Free:	
Blower Door Flow Rate (CFM50):	2,972	Left Window (sf):	24	Total # of Lamps:	32
Primary Foundation:	Slab on Grade	Heating System Type:	Boiler-Baseboard	Incandescent/Halogen Lamps:	1
Percentage of Total:	100%	Heating System Year Installed:	2012	LED or CFLs currently installed:	25
Existing R-Value:	0	Heating System Fuel:	Natural Gas	Florescent Tubes:	6
Recommended R-Value:	21	Efficiency Rating (AFUE):	92	Refrigerator ENERGY STAR:	No
Secondary Foundation:	Conditioned Basement	Recommended AFUE (or equiv.):		Refrigerator kWh Usage per Year (est.):	583
Percentage of Total:	%	Secondary Heating System:		Second Fridge ENERGY STAR:	No
Existing R-Value:	11	Cooling System Type:	None	Second Fridge kWh Usage per Year:	
Recommended R-Value:	21	Efficiency Rating (SEER):		Freezer ENERGY STAR:	No
Primary Wall Construction:	Concrete Block	Recommended SEER:		Freezer kWh Usage per Year (est.):	
Exterior Finish:	Stucco Finish	Fireplace Type:	Wood	Dishwasher ENERGY STAR:	No
Existing R-Value:	3	Hot Water System:	Indirect	Clothes Washer ENERGY STAR:	Yes
Recommended R-Value:	21	Hot Water System Year Installed:	2012	Clothes Dryer ENERGY STAR:	
Recommended Continuous R-Value:	5	Hot Water System Fuel:	Natural Gas	Clothes Dryer Fuel Source:	
Secondary Wall Construction:	Wood Frame	Set Temperature:	120	Heat Tape Length (ft):	
Exterior Finish:	Wood Siding	Solar Thermal Assist:	N/A	Heat Tape Estimated kWh per month:	0
Existing R-Value:	11	Pipes Insulated?:	No	Hot Tub Capacity:	
Recommended R-Value:	21	Efficiency Rating:		Hot Tub Estimated kWh per month:	0
Recommended Continuous R-Value:	5	Recommended Efficiency:		If Electric Baseboard, Length (ft):	