ENERGY PERFORMANCE SCORE

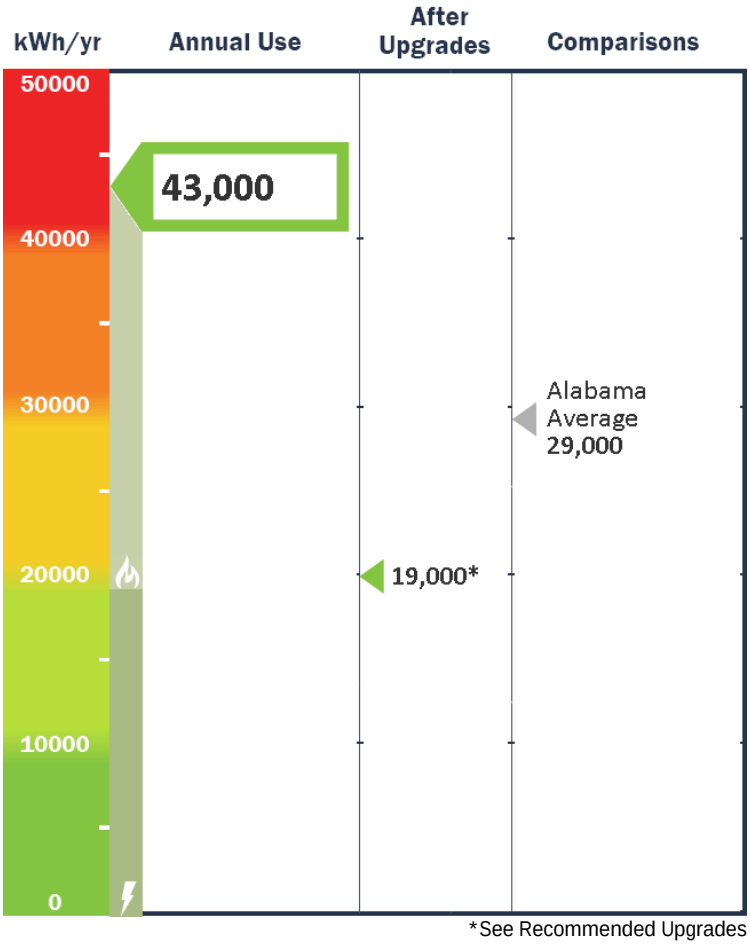
Address: [redacted]
Huntsville, AL 35810

Reference Number: 010000122

	Current Energy Use	Energy Cost
Energy Score:	43,000 kWhe/yr	$2,434
Electric:	19,400 kWh/yr	$1,648
Natural Gas:	800 therms/yr	$787

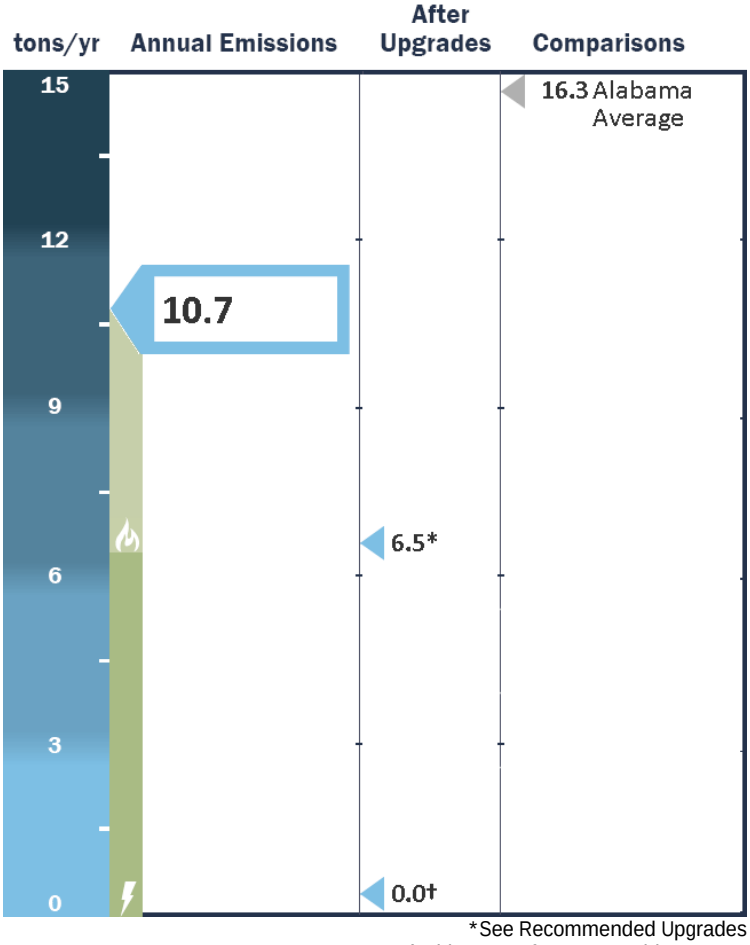
	Carbon
Carbon Score:	10.7 tons/yr
Electric:	6.4 tons/yr
Natural Gas:	4.3 tons/yr

Energy Score



*See Recommended Upgrades

Carbon Score



*See Recommended Upgrades
†With energy from renewable sources

This score measures the estimated total energy use (electricity, natural gas, propane, heating oil) of this home for one year. The lower the score, the less energy required for normal use. Actual consumption and costs may vary.
Measured in kilowatt hours per year (kWhe/yr).

This score measures the total carbon emissions based on the annual amounts, types, and sources of fuels used in this home. The lower the score, the less carbon is released into the atmosphere to power this home.
Measured in metric tons per year (tons/yr).

Bedrooms: 5+
Year Built: 2002

Audit Date: 02/09/2012
Auditor: Synergy Air Flow and Ventilation
Witt, Todd

SIMPLE EPS Version 2.0 v20111011

Energy Performance Score

What is the Energy Performance Score?

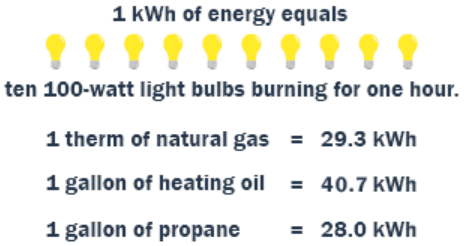
A Third-Party Certified Score The Energy Performance Score calculation is based on a home energy assessment. Anyone may use the EPS assessment methodology for evaluating energy performance and upgrades of a home, but only a certified EPS analyst has been trained and qualified to conduct an EPS. A third-party certified EPS can only be issued by a certified EPS analyst who does not have any material interest in the energy work that will be, or has been, performed on the home.

Energy

Energy Score Calculation The Energy Score is based on a home's shape, size, insulation levels, air leakage, heating and cooling systems, major appliances, lighting, and hot water heating. Occupancy, behavior, indoor temperature, and regional weather are standardized to calculate normal energy use. A home's actual energy use will vary with behavior, weather, and changes to the home.

Measurements Defined

Electricity is measured in kilowatt hours (kWh). Natural gas is measured in therms. Oil and propane are measured in gallons (gal). Units of energy can be converted from one to another. Total energy use is represented in kilowatt hour equivalents.



Energy Costs - Fuel costs are based on prices at the time this report is issued* and do not include taxes, surcharges, or fees for renewable energy.

Benchmarks Defined

After Upgrades indicates the improvement in the predicted energy use if the lower and higher cost Recommended Energy Upgrades are implemented.

Alabama Average is the average energy use of households in the state.

Target is equivalent to 50% of the the state average energy use.

Carbon

Carbon Score Calculation The Carbon Score is based on the greenhouse gas emissions for the annual amounts, types, and sources of fuels used in the home. For electricity, the carbon emissions are based on electricity consumed and the mix of sources used in the sub-region. For natural gas, heating oil, and propane, carbon emissions are based on the therms or gallons used in the home.

Measurements Defined

While site energy is used to determine a home's annual energy consumption, source energy is used to calculate the home's associated carbon emissions. This is reflected in the sub-region emissions factor for electricity.

Benchmarks Defined

†With energy from renewable sources indicates the carbon emissions produced if the homeowner chooses to offset the carbon emissions associated with electrical use. Check with your utilities to learn more about these options.

After Upgrades indicates the improvement in the predicted carbon emissions if all of the Recommended Energy Upgrades suggested on the Energy Analysis Report are implemented.

Alabama Average is the average carbon emissions of households in the state.

Target is equivalent to 50% of the the state average carbon emissions.

*Estimated energy costs are based on the following rates.

Electric = $0.09/kWh	Oil = $1.88/gal
Natural Gas = $0.97/therm	Propane = $3.05/gal

ENERGY ANALYSIS REPORT

EPS
Energy Performance Score

Date: 2/23/12
Reference Number: 010000122
Address: [redacted]
Huntsville, AL 35810

Contents

Annual Estimated Energy Use and Fuel Costs

	Current Home			After Upgrades		
	Energy (kWhe)*	Fuel Cost†	Carbon (tons)	Energy (kWhe)*	Fuel Cost†	Carbon (tons)
Heating	23,800	$787	4.3	4,400	$376	1.5
Cooling	5,700	$486	1.9	2,800	$240	0.9
Water Heating	3,700	$316	1.2	3,000	$256	1.0
Lighting & Appliances	9,900	$846	3.3	9,200	$786	3.1
Total (Rounded-off)	43,000‡	$2,434	10.7	19,000	$1,658	6.5

*All energy forms are converted to their electrical energy equivalents, expressed in kilowatt-hours electric (kWhe).
†Fuel costs are based on prices at the time this report is issued and do not include taxes and surcharges.
‡Total Annual Estimated Energy Use is rounded to the nearest 1000 kWhe.

Comparing Your Utility Bills with the EPS Score

You can determine how your household's energy use compares to the estimated average use for your home by comparing the energy totals on your utility bills with the EPS Score.

To calculate your actual annual energy use, you will need to know the amount of energy that you used for each fuel type in your home for a full year. This information is available on your utility bills. The formulas on the back of the EPS Scorecard will allow you to convert combustion fuels to KWH. The EPS Score should be compared to the annual totals of all fuel types.

If the totals from your utility bills are:

- lower than the Energy Score, you are using less energy than would be average for your home. Reasons for this may include housing fewer people than would be average in this home, and/or the occupants of this home are using energy more conservatively than is typical.
- similar to the Energy Score, you are using a typical amount of energy for the condition of your home.
- higher than the Energy Score, you are using more energy than average for your home. Reasons for this may include housing more people than would be average in this home, and/or occupants in this home are using more energy than is typical. There may be no- and low-cost ways that you can use to save energy.

Summary of Energy Performance Related Elements

Element	Description	Notes	Current Performance Very Poor • Poor • Average • Good • Excellent
Air Leakage How tight your home is against air leaks.	Major leakage areas include: Attic hatch, Poor or no weatherstripping at doors, Plumbing penetrations, Recessed lights, Electrical outlets, Around heating registers, Fireplace damper		Poor
Ceiling and Attic The amount of insulation above the ceiling or in the roof.	Blown in, Fiberglass		Poor
Ducts How well sealed and insulated are the ducts.	Flexible ductwork, Not Sealed		Average
Walls The amount of insulation inside the walls.	Batts		Average
Floors/Foundation Walls The amount of insulation below the floors.	No insulation, Crawlspace		Poor
Windows The insulation value of the windows.	Double pane		Poor
Water Heating How efficient and insulated is the hot water system.	Electric		Poor
Lights and Appliances How efficient are the lighting and appliances.	No cfl's, Energy Star Refrigerator		Very Poor
Heating How efficient is the heating system.	Electric, Gas		Poor
Cooling How efficient is the cooling system.	Air conditioner		Poor

General Notes

Energy Performance Score

Summary of Recommended Energy Upgrades

These recommended upgrades will improve the energy performance of this home. The cost for the upgrades will vary with the size and complexity of the home and the scope of work required. The Approximate Annual Savings are based on the estimated energy reductions with each upgrade.

	Notes	Approximate Annual Savings	
		$	kWh Equivalent
Air Sealing	Seal air leaks to reduce leakage (air leakage rate remains above .35 ACHn).	$59	700
Attic/Ceiling Insulation	Insulate attic to R-49.	$176	2,100
Duct Sealing	Seal all seams and joints on ductwork and plenum with mastic paste.	$130	1,500
Duct Insulation			
Wall Insulation			
Floors/Foundation Walls	Fully insulate floor joist cavity with fiberglass or cellulose (Savings assumes R30).	$65	800
Windows	Upgrade to high efficiency windows.	$92	1,100
Water Heater Upgrade	Install a high efficiency electric water heater.	$10.41	120
Solar Water Heater			
Appliances	Replace washing machine with an ENERGY STAR washing machine., Replace dishwasher with a high efficiency dishwasher., Replace all light bulbs with CFL's.	$133	1,600
Heating System Upgrade	Install an ENERGY STAR heat pump.	$200	15,100
Cooling System Upgrade	Upgrade to a newer ENERGY STAR air conditioner.	$57	700
Solar PV			

Financial Incentives

See web site for more sources of financial assistance.

See http://www.dsireusa.org/ for incentives in your area.

DSIRE is a comprehensive source of information on state, local, utility and federal incentives and policies that promote renewable energy and energy efficiency. Established in 1995 and funded by the U.S. Department of Energy, DSIRE is an ongoing project of the N.C. Solar Center and the Interstate Renewable Energy Council.

Energy Performance Score

Air Leakage

Plumbing

Recessed Lighting

Current Conditions Observed by Auditor

A Blower Door Test was performed on your home to determine the amount of leakage of the Living Envelope. The goal in in new construction homes is 5 ACH or less; in older homes this is often unachievable. Your home tested at 8.44 ACH. The home is leaking badly through HVAC registers, wall plates, plumbing penetrations, can light penetrations, lighting penetrations, windows, doors, outlets, returns, around bath fan penetrations, and fireplaces.

A Pressure test was also conducted while the Blower Door was running to measure connectivity with both the attic and crawl space. Pulling 45 pascals out of the living envelope, your home measured 50 on connectivity to the crawl space and 42 with the attic space. The goal is to air seal penetrations and reduce connectivity so that air leakage is less prevalent, minimizing the risk and need of the living envelope requiring replacement air from an unconditioned area.

Recommended Upgrades Detail

Simply adding insulation to lower energy consumption is not advisable as it serves as a better filter. Air seal 1st, insulate 2nd. We recommend air sealing all possible penetrations.
Synergy can seal around lighting and plumbing penetrations, register sealing, attic pull down access for $750. Recessed can light covers can be installed where accessible for $35 per light.

Deep Energy Retrofit Options

Energy Upgrade Description

Air Sealing Air sealing is one of the most cost-effective energy upgrades you can make and should be done before installing insulation. Cold air can infiltrate small cracks and openings during the winter, while hot outdoor air can over- heat your home in the summer resulting in drafts, moisture, and indoor air quality issues. There are many types of air leaks and many strategies for sealing them. You can under- take this work yourself or hire a contractor who can use a blower door to identify and measure the effectiveness of various air sealing measures.

After your home is sealed, it is important to make sure that there is adequate ventilation to maintain proper indoor air quality and to prevent back drafting of combustion appliances. An EPS Auditor or qualified professional will identify any potential ventilation problems.

No-Cost or Low-Cost Strategies

Close your fireplace damper when your fireplace is not in use (but first allow the fireplace to cool completely). If you have fireplace doors, keep them closed.

Put bathroom ventilation fans on a timer or on a humidity sensor which will automatically switch off the fan when the room is dry.

Ceiling and Attic

Attic

Attic Knee Walls

Current Conditions Observed by Auditor

Attic insulation was originally installed at an R30 depth but has settled over time.

Recommended Upgrades Detail

Once again, we recommend to air seal 1st and re-insulate 2nd. Synergy can add an R-19 Fiberglass adder to attic space for $1175. Baffles can be installed at the eave areas to prevent installed insulation from obstructing the eave areas for $300. Attic Knee Wall can be sealed for $250. There is another area that has sheet rock and many storage items where it could not be determined on what material would be required to seal exposed knee walls. If you become serious in sealing this area, we can return to quote with sufficient access.

Deep Energy Retrofit Options

Roof can be encapsulated with 5.5 inches of Open Cell Foam for $6500. This option puts the upstairs ducts into conditioned space and extends the life and effectiveness of the HVAC system, also reducing energy consumption in a dramatic way. Air sealing is not necessary if this option is chosen.

Foam Manufacturers recommend tr removal of loose blown insulation if foam is installed. The traditional insulation can be removed for $2800 and dumpster fee for disposal is $250.

Energy Upgrade Description

No-Cost or Low-Cost Strategies

Ceiling & Attic Insulation Attic or ceiling insulation is one of the most cost-effective upgrades you can make and should be done after air sealing in the attic. Attic or ceiling insulation slows heat loss through the roof in the winter and also slows heat gain through the roof in the summer. The insulation is usually installed on the floor of an unfinished attic (the ceiling of the finished room below) and under the roof if the attic space is finished. Insulation is measured with an R-value, and the higher the R-value, the more effective the insulation value. Insulation is made of different materials and comes in several forms: batts, loose-fill or blown-in, foam, and rigid. Each type of insulation varies in terms of advantages, applications, and pricing.

Ducts

Current Conditions Observed by Auditor

Ducts are flex and average at best.

Recommended Upgrades Detail

We recommend duct sealing from an HVAC provider using mastic to seal and allow the best success of all available air supplied to actually reach the living envelope.

Deep Energy Retrofit Options

Energy Upgrade Description

No-Cost or Low-Cost Strategies

Duct Sealing and Insulation Heating and cooling duct work that leaks into unconditioned space can be a major source of energy loss. Sealing and insulating your ducts helps to save energy by more effectively directing the heat or cooling to desired locations. Insulating ducts in semi-conditioned spaces such as basements may or may not be necessary depending on the circumstances.

Ducts should always be sealed before insulating.

Walls

Current Conditions Observed by Auditor

Wall are fiberglass.

Recommended Upgrades Detail

None at this time.

Deep Energy Retrofit Options

Energy Upgrade Description

No-Cost or Low-Cost Strategies

Wall Insulation Insulating walls will help you to keep heat inside your home during the winter and slow heat gain into your home during the summer. Retrofitting walls with insulation is generally more work and more costly than insulating an attic ceiling or a floor. Walls may be insulated from the outside or inside and this is more easily accomplished during remodeling work which in- volves removal of or painting either of these surfaces.

Floors / Foundation Walls

Crawl 1

Crawl 2

Current Conditions Observed by Auditor

Crawl Space has signs of moisture. I did find one piece of wood that appeared to have been impacted by termites. The ground is soft underneath the vapor barrier and the there are signs of both some water penetrating the concrete block walls and also air transported moisture where hot air comes through the vents and collides with cool ducts, condensing and creating its own moisture.

Recommended Upgrades Detail

R19 Fiberglass can be installed to improve energy efficiency for $1150, but in the present state, I do not recommend it as it could assist in holding moisture to floor system. Remove all wood from the crawl space immediately.

Deep Energy Retrofit Options

We believe in closed crawl space systems which put the duct system in conditioned space and extends the life of the HVAC system and helps prevent moisture from entering the crawl space. We spray 1.5 inches of closed cell foam on concrete block walls which serves as a vapor barrier and use dehumidification to continually manage the crawl space. We also provide a hygrothermometer to monitor crawl space humidity from inside the home itself.

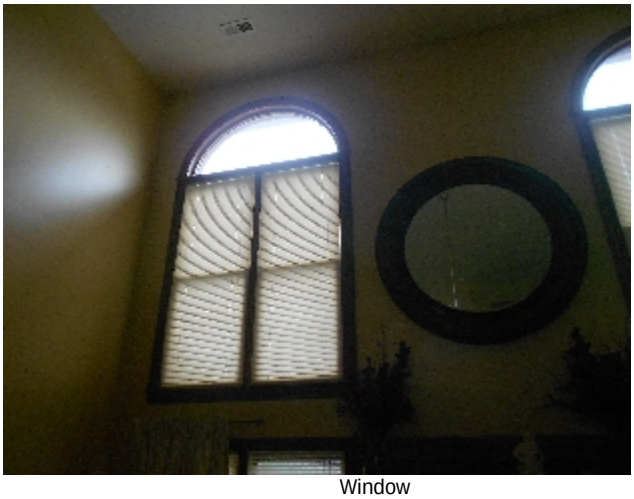
Price for such a system with with foam: $4950
Please see "Closed Crawlspace Systems" on our website at www.wetestothersguess.com for more information.

Energy Upgrade Description

No-Cost or Low-Cost Strategies

Floor Insulation Floor insulation is mainly a cold climate energy saving measure. The importance of floor insulation varies with the type of foundation in the home. The lowest floor cavity in a home should only be insulated if the basement or crawlspace below it is unheated. In a heated basement or crawlspace the insulation will be found in a different location. Slab floors on-grade or in a basement can be retrofitted with insulation above the slab if no insulation was installed beneath the slab before it was poured.

Windows



Window

Window 2

Current Conditions Observed by Auditor

Windows are original and are leaking badly. There are numerous half rounds that have no shading as well.

Recommended Upgrades Detail

Windows are one of the toughest investments with regards to return on investment. I would recommend window tinting 1st on all of the larger windows, especially those with non shaded half rounds. This will significantly reduce the amount of heat entering the home. Wood blinds rather than the existing install will help as well. Please contact Nexus for our current group of window partners if interested.

Deep Energy Retrofit Options

Energy Upgrade Description

No-Cost or Low-Cost Strategies

Windows Older windows can be responsible for drafts, heat loss in winter and heat gain in summer. They can significantly impact your comfort and energy use for heating and cooling. Storm windows can help eliminate some of these issues. High efficiency, double-paned, low- e, argon-filled windows with insulated frames can help save energy, make rooms more comfortable and also makes them quieter.

No-Cost or Low-Cost Strategies

Capture free solar heat. On cooler days, open curtains to catch the heat from the sun and warm your home.

Block the sun in hot weather. To keep your home cool, adjust window coverings to block the sun's hot summer rays. In the evening, open windows to catch cool breezes.

Plant trees, bushes, and trellises that block unwanted sun in the summer. Strategically located plants on the east, west, and south sides of a house can provide natural cooling through shade. Deciduous plants will shade in summer and allow more light in winter. Plants can also form windbreaks to protect your home from winter winds. Be sure to plant away from the house so you do not trap moisture against the building.

Water Heating

Water Heater

Current Conditions Observed by Auditor

Standard tank, not very efficient.

Recommended Upgrades Detail

We recommend a Marathon Lifetime Electric Unit for your home.

Deep Energy Retrofit Options

Energy Upgrade Description

No-Cost or Low-Cost Strategies

Water Heater Upgrade The life cycle of water heaters is approximately 12-15 years. If your water heater is older, consider replacing it with a newer, more efficient one. All new tank water heaters have a built-in insulation layer to conserve energy. Solar water heating may also be an option: it can provide as much as 75% of your hot water needs and offers significant savings over time.

Solar Water Heater Installing a solar water heater on a roof that received adequate sunlight can be a relatively cost-effective means of reducing your energy costs over the long term. These systems can preheat the water going to your hot water heater and significantly reduce, and at times eliminate, the need for additional water heating.

No-Cost or Low-Cost Strategies

Lower your water heater thermostat to 120 degrees, or the lowest setting that is acceptable to you for bathing and dishwashing.

Turn off hot water during vacations. Turn your electric water heater off at the breaker panel if you are leaving town for more than a couple of days. But don't do this during freezing weather. If you have a natural gas water heater, turn it to the "low" or "vacation" setting, but do not turn it off.

Don't let the hot water run while shaving or washing dishes.

Install high-efficiency showerheads and faucet aerators. New showerheads are required to meet a 2.5 gallon per minute standard; the lower the number, the more you will save. If you have a pre-1992 showerhead, it could be using 5.5 gallons of water per minute or more. Look for low-flow aerators of 2.5 gallons or less to fit bath- room and kitchen faucets.

Lights and Appliances

W/D

Current Conditions Observed by Auditor

Refrigerator is relatively new, no true shift to CFL/LED lighting and all other appliances are old.

Recommended Upgrades Detail

Recommend a strong shift to florescent/LED lighting and upgrading appliances to the latest Energy Star units.

Deep Energy Retrofit Options

Energy Upgrade Description

No-Cost or Low-Cost Strategies

Appliances Older appliances can use significantly more energy than newer, energy efficient appliances. Look for ENERGY STAR refrigerators, freezers, dishwashers, clothes washers, and air conditioners. Even within ENERGY STAR there are more and less efficient models and you should look for the most efficient appliance that fits your budget and needs. If you consider the full life cycle costs, more efficient appliances often make up for any difference in price within a few years of operations.

No-Cost or Low-Cost Strategies

Wash laundry in cold water whenever possible. Ninety percent of energy used for washing laundry goes toward heating water. Only run the washer when you have a full load.

Use the dishwasher energy-saver mode and run the dishwasher only when it is full.

Eliminate Phantom Loads. Many home electronics such as computers, televisions, and battery chargers use energy when not in use or turned off. Unplug these or plug them into a power strip that can be turned off when not in use.

Hang your clothes outside to dry whenever possible to reduce the use of your energy-intensive electric or gas dryer.

Eliminate unnecessary lights and replace incandescent bulbs with energy-saving compact fluorescents (CFLs) or LED lights. You can save at least 75% of the energy used for lighting. CFLs that emit a warm color similar to in- candescent bulbs (soft white color) and that turn on more quickly are now available. It is important to handle and recycle broken and burned out CFLs appropriately as they contain small amounts of mercury. Motion detectors and timers can eliminate unnecessary lighting outside and in infrequently used rooms.

Energy Performance Score

Heating

Current Conditions Observed by Auditor

Systems are old and inefficient

Recommended Upgrades Detail

Recommend replacing both units. We also recommend an evaluation of the return sizing. We use 400 CFM per ton as a general rule of thumb and based on that calculation, both units have undersized returns. There also appears to be many doors that are closed at times due to sleep, animals etc. We discussed pressure issues present and an ideal place for an additional return downstairs would be somewhere within the Master Bedroom, nullifying a need for the interior door to remain open so that air can flow back to the return. We also recommend a transfer grille system for the upstairs bedrooms if they are to be closed, so that air could transfer through a duct system when doors are closed and get back to the return in the hallway.

Keep in mind that air supplied to the living envelop must get back to the return; otherwise the home succumbs to negative pressure and will pull from the closest, largest hole from unconditioned space to replace the air lost. Negative pressure can be caused by air leakage due to the lack of sealing, closing interior doors which prevent air from flowing back to the return, and appliances that either consume air such as a gas cook top stove, or a dryer which will pull air from the living envelope to the outside.

Deep Energy Retrofit Options

Energy Upgrade Description

No-Cost or Low-Cost Strategies

Heating System Upgrade Older, poorly maintained, and less efficient furnaces and heat pumps use more energy than newer, high-efficiency models. You may achieve energy savings by upgrading your system. Additionally, you should have your existing system periodically inspected to identify potential problems and extend the life of your system. When upgrading a heating system, you should also have any connected duct system inspected for air leaks and appropriate upgrades.

No-Cost or Low-Cost Strategies

Turn down the heat. A good energy-saving setting when you are at home is 67-68 degrees and 55 degrees at night or when you are away. Each degree you lower your thermostat saves an estimated two percent (2%) on your heating bill. In summer, turn off your heating system or raise the thermostat setting to save on air conditioning.

Higher heat is not faster heat. Turning the thermostat higher will not warm your house faster; it just wastes energy. Lowering the air conditioning setting won't cool your house faster either.

Use a programmable thermostat. Older, manual thermo- stats are often not as accurate as new electronic models, and they require that you manually set them back each night. Some programmable thermostats have smart features such as preprogrammed "night" and "vacation" energy-saving settings that lower the temperature auto- matically. Different heating systems require different thermostats. Check the owner's manual to be sure that your thermostat and heating system work effectively together.

Energy Performance Score

Cooling

Current Conditions Observed by Auditor

Units are original and inefficient.

Recommended Upgrades Detail

See Heating Notes for recommendations.

Deep Energy Retrofit Options

Energy Upgrade Description

No-Cost or Low-Cost Strategies

Cooling System Upgrade. Cooling is not the predominant energy use in a home in our climate zone, however, older, poorly maintained cooling equipment will still use more energy than newer, more efficient equipment. Heat pumps should be commissioned and regularly maintained to maximize their efficiency potential. Air conditioners should be inspected and serviced by a professional to help extend the life of the system.

No-Cost or Low-Cost Strategies

Block the sun in hot weather. To keep your home cool, adjust window coverings to block the sun's hot summer rays. In the evening, open windows to catch cool breezes.

Use air movement to cool people during hot days. When it's warm, use natural ventilation or window and ceiling fans to keep cool. Remember that fans cool people, not rooms. If these are insufficient, consider installing a whole house fan which will vent warm air from the home and pull in cooler outside air throughout the house at night.

Plant trees, bushes, and trellises that block unwanted sun in the summer. Strategically located plants on the east, west, and south sides of a house can provide natural cooling through shade. Deciduous plants will shade in summer and allow more light in winter. Plants can also form windbreaks to protect your home from winter winds. Be sure to plant away from the house so you do not trap moisture against the building.