



Home Performance with Energy Star®

By Abacus Energy Solutions, LLC



Location:

1234 SW Main Street
Anytown, OR 97555

Audit Date:

9/20/2009

Prepared For:

Karen McDonald

Prepared by:

Abacus Energy Solutions, LLC
12085 SW 135th Avenue, Suite 63
Portland, Oregon 97223
503-430-0640
sales@portlandenergysavers.com

Auditor:

John Smith



Your Home Performance with Energy Star® Report

by *Abacus Energy Solutions*:

- Lists possible energy efficiency improvements and explains each recommendation in detail;
- Provides information on implementation and contractor resources;
- Suggests additional energy efficiency measures;
- Gives guidance on indoor air quality; and,
- Provides information about financing and special tax incentives.

Implementing these recommendations will reduce your energy bills and make your home more comfortable and more valuable. It will also help the environment.

The Plantico Home	
AUDIT ID:	1052
Structure type:	Single Family with Garage
Date built (est.):	1985
# of bedrooms:	4
Size of heated area (sq. ft.):	3425
Volume of heated space (cu. Ft.):	30825
Heating fuel:	Natural Gas
Effective price of heating fuel:	\$1.48/Therm
Effective price of electricity:	\$0.11/kWh

The estimates in this Abacus Energy Solutions report are based on data obtained from your energy bills and a detailed audit of your home. The data was analyzed using the Conservation Services Group (CSG) HOMECHECK software and AUDIT by Abacus Energy Solutions, LLC, which takes account of local weather, energy prices and implementation costs. The HOMECHECK software is based on thousands of home energy inspections within the Portland metropolitan area and across the United States. Savings estimates do not take account of variations in the behavior of the occupants, unknown third party installation changes, future energy prices or weather changes. Nor do the cost estimates reflect variations in the complexity of the job or price variance among contractors and suppliers.

Abacus Energy Solutions, LLC does not offer any warranty, either expressly or implied, for the estimated savings or costs in this Report. Should you find an error in the Report, please call us at 503-502-8834. The liability of Abacus Energy Solutions, LLC for any errors or omissions in this Report is limited to the fee paid for this Report.

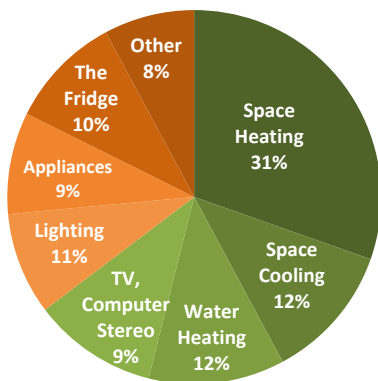
Save Money and Energy Today

Did you know that the typical U.S. family spends about \$1,900 a year on home utility bills? Unfortunately, a large portion of that energy is wasted. Each year, electricity generated by fossil fuels for a single home puts more carbon dioxide into the air than two average cars. The good news is that there is a lot you can do to save energy and money at home.

The key to achieving these savings in your home is a whole-house energy efficiency plan. To take a whole-house approach, view your home as an energy system with interdependent parts. For example, your heating system is not just a furnace—it's a heat-delivery system that starts at the furnace and delivers heat throughout your home using a network of ducts. Even a top-of-the-line, energy-efficient furnace will waste a lot of fuel if the ducts, walls, attic, windows, and doors are not properly sealed and insulated. Taking a whole-house approach to saving energy ensures that dollars you invest to save energy are spent wisely.

Energy Use in the Home

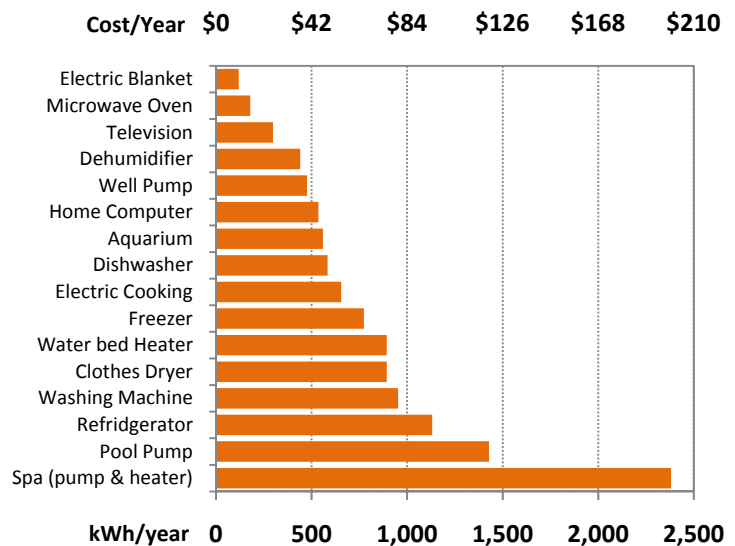
The first step to taking a whole-house energy efficiency approach is to find out which parts of your house use the most energy. Your Abacus Energy Solutions auditor will pinpoint those areas and suggest the most effective measures for cutting your energy costs.



How we use Energy in Our Homes

How Much Electricity do Appliances Use?

The above chart shows how much a typical appliance uses per year and its corresponding cost based on national averaged. For example, a refrigerator uses almost five times the electricity the average television uses.



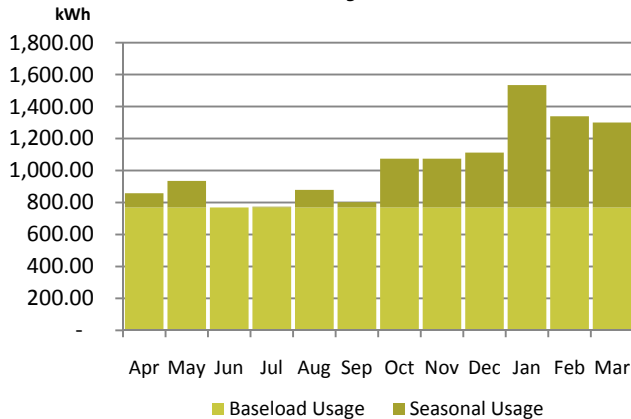
Seven Tips to Save Energy Today *Easy low-cost and no-cost ways to save energy.*

- Install a programmable thermostat to keep your house comfortable in the summer and the winter.
- Use the energy-saving settings on all your appliances, such as refrigerators, dishwashers, washing machines, and clothes dryers.
- Look for the ENERGY STAR label on home appliances and products. ENERGY STAR products meet strict efficiency guidelines set by the U.S. Department of Energy and the Environmental Protection Agency.
- Turn off your computer and monitor when not in use.
- A fireplace can be a major drain on home energy. If you do not use your fireplace consider purchasing an inexpensive damper balloon to stop warm air from escaping up your chimney.
- In winter set the ceiling fan at a slow speed to push warm air from the ceiling and circulate around the room.
- **Visit www.portlandenergysavers.com for more energy-saving ideas.**

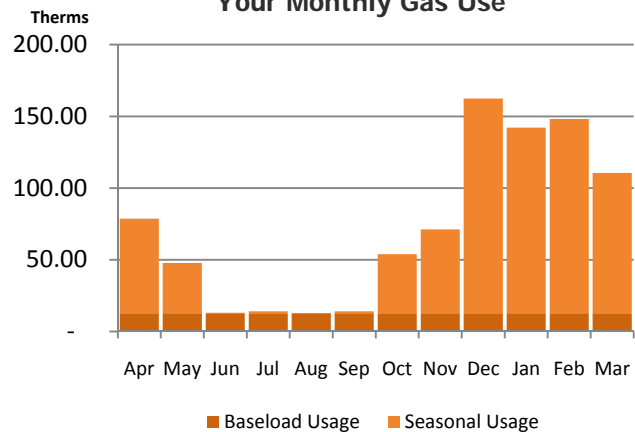
Your Baseload vs. Seasonal Energy Use

Baseload energy consumption, simply put, is the amount of energy your household consumes under the best possible conditions. It's the time of year when your furnace or air conditioner is not running. Seasonal energy use is when you are heating or cooling your home. Implementing weatherization improvements or turning down the thermostat will decrease seasonal energy use. Lifestyle changes such as lowering the temperature of your water heater, taking shorter showers or switching to ENERGY STAR appliances will decrease your baseload use.

Your Monthly Electrical Use



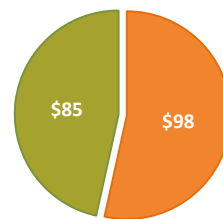
Your Monthly Gas Use



Understanding the graphs:

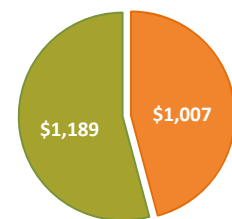
Your estimated **baseload usage** is located on the bottom portion of the above graphs. The baseload includes water heating, lighting, refrigeration, laundry and other uses that don't vary much month to month. Located on the top of the graph is your estimated **seasonal usage** during the heating & cooling months. Weatherization changes to your home will have the greatest reduction on the seasonal usage and lifestyle or appliance changes will have the greatest reduction on the baseload.

Your Monthly & Yearly Costs



AVERAGE BILLS

Gas (Avg. monthly bill)
Electricity (Avg. monthly bill)



SEASONAL COSTS

Baseload Costs
Seasonal Heating & Cooling Exp.

Changing your Baseload

Many families could shave at least 25 percent off their energy costs by adopting energy-conserving habits.

Refrigerators & Freezers

Refrigerators & freezers consume more electricity than any other appliance, accounting for 8 to 15 percent of your total electrical consumption. Switching to an ENERGY STAR appliance or reducing the number of these appliances in your home will have a big impact on your electricity bill.

Lighting Upgrades

Today's ENERGY STAR lights equal or surpass the quality of light from conventional incandescent lights and use up to 75% less energy and last up to 10 times longer.

Laundry

Washing in cold water can save you over \$60 a year and line drying can save you between \$100 and \$200 a year. If this is not practical run your dryer with full loads only, clean the lint filter often and use a "Moisture Sensor" cycle instead of a timer.

Small Appliances

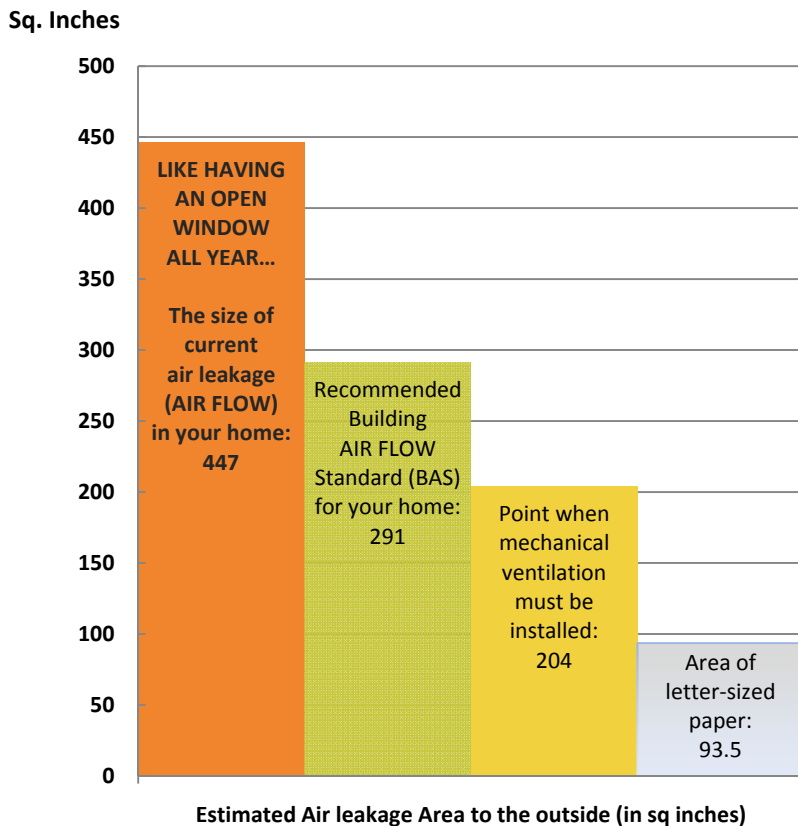
Many modern appliances (computers, TVs, coffee makers) consume electricity even when they are off. These always-on "phantom" loads use electricity costing \$50 to \$100 annually in many homes. One idea is plug these appliances into a power strip and turn the switch off when not in use.

Air Leakage & Blower Door Test

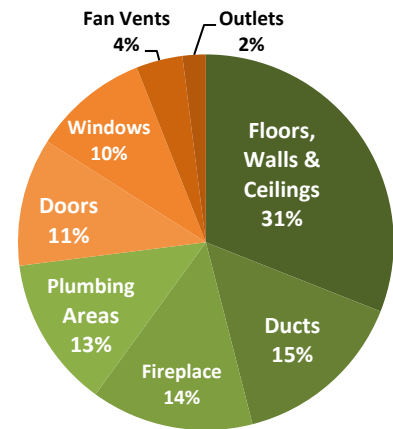
Many people assume that a home is built with enough insulation to help keep warm air inside during the winter, and outside during the summer. But the truth is not all insulation performs the same, and insulation is only half the solution to making sure that your home performs at its best for maximum comfort.

An important piece of the solution to creating a better living environment within your home is to reduce uncontrolled air leakage. A percentage of your heating and cooling dollars escape through unseen cracks and gaps in a typical house. It can be like leaving a window wide open all year-round.

Air Area in your Home



The Above Graph: The air leaks in your home equal 447 square inches (about the area of 4.8 sheet(s) of paper). Abacus Energy Solutions recommends air sealing your home to the recommended Building Airflow Standard. **See Blower Door Test results below.**



Common Air Leak Sources

How to stop air leaks?

Once air leaks are detected, a variety of materials are used to eliminate air passages in attics, basements, and living spaces. Materials used in air sealing include sealant foams, caulking, weatherstripping, and rigid insulation. When leaks are sealed, less air escapes into your attic, passes through walls, floors and vent stacks, or is drawn into your basement. This sealing procedure also helps prevent moisture problems that can lead to wood rot and pest infestation.

The Blower Door Test Results

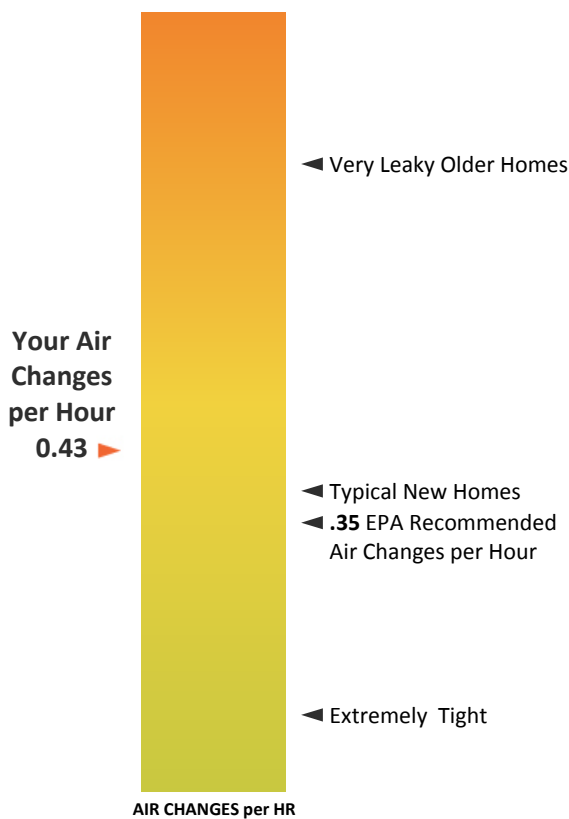
Your Building Shell Leakage was determined to be 4466 cfm₅₀ or 4466 cubic feet of air moving through your home when the blower door depressurized your house to negative 50 Pascal of pressure. Current industry standards indicate your Building Air Flow Standard (BAS) is 2913 cfm₅₀. The BAS limit indicates how much air should be leaking so you have fresh air even when the windows and doors are shut. Your house is currently leaking at 153% above the BAS limit. **Abacus Energy Solutions recommends that you seal your house down to 2913 cfm₅₀.**

House Ventilation & Insulation

Most existing homes depend on air leakage to provide fresh ventilation from outside of the home to its occupants. This airflow is important for removing moisture, combustion gases and stale air from your home. The Environmental Protection Agency (EPA) recommends .35 air changes per hour for healthy living; however this number only tells part of the story, it is important to know from where the air is coming. Air flowing through windows and doors, or controlled venting, is much cleaner than the air leaking into your house from the attic, basement or crawlspace. For air quality, comfort and energy efficiency, the goal is to seal leaks from the attic, basement or crawlspace while maintaining proper ventilation throughout each area. Appropriate ventilation is required in combustion appliances areas or in the attic where moisture could damage insulation or the roof.

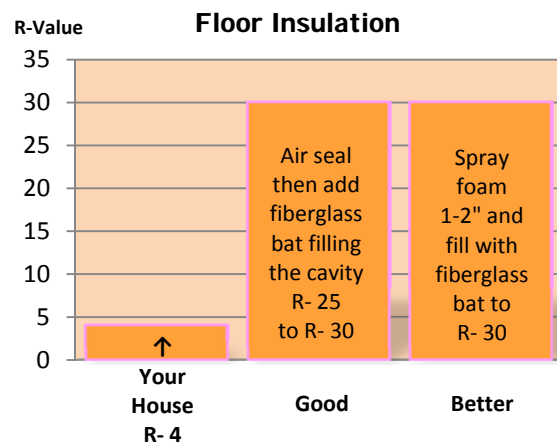
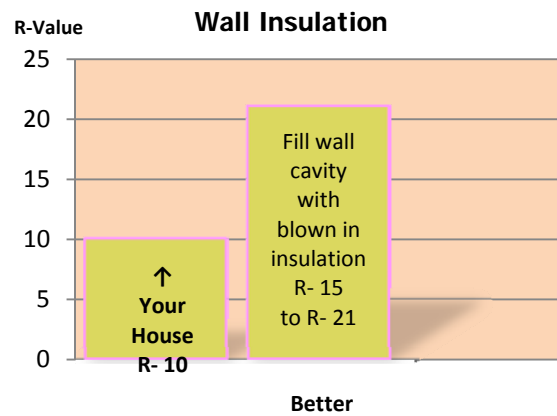
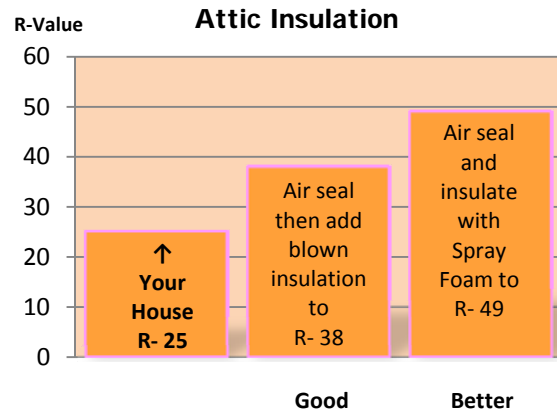
Your Home's Air Changes per Hour

The EPA recommended natural air change rate within a residential space should be .35 times per hour.



Insulation Charts:

The three charts on the right indicate the current effective R-value and the recommended R-values for the insulation in your attic, walls and floor. The R-value indicates an insulation's resistance to heat flow (the higher R-value the better). Insulation improvements will provide you energy savings and an added sound barrier. These recommendations are most effective when installed in conjunction with air sealing.



Air Quality and Combustion System Safety

According to the Centers for Disease Control and Prevention (CDC) carbon monoxide (CO) is the leading cause of accidental poisoning deaths in the country. More than 15,000 people per year are hospitalized with CO exposure and more than half of all CO related deaths are caused by improperly venting or operating home heating systems.

At Abacus Energy Solutions we take carbon monoxide leakage and fire safety very seriously. We test all combustion appliances (gas water heaters, furnaces and ovens) for fuel leaks, ambient CO and fire safety. It is strongly recommended that your home has a working carbon monoxide detector, fire extinguisher and smoke alarm. These items are available for purchase from your Abacus Energy Solutions auditor.

Combustion Appliance Zone (CAZ) Tests:

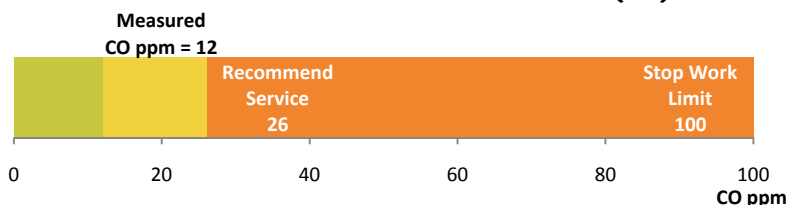
As part of your audit all combustion appliances are tested for gas spillage, CO levels and draft pressure. Since electric appliances do not emit CO they automatically pass these tests. For more information on CAZ testing please read the section on the right.

Natural Gas Leakage:	NONE
Ambient CO Detection:	0 parts per million (ppm)
Smoke Alarm	Tested working
CO Monitor	Tested. Replaced battery
Fire Extinguisher	Customer purchased onsite

Your Natural Gas Water Heater:

Your Natural Gas water heater PASSED worst case scenario and PASSED in natural conditions.

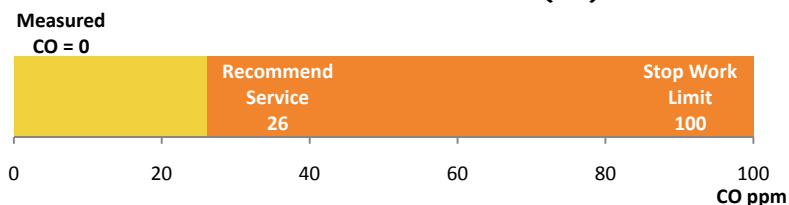
Water Heater Carbon Monoxide (CO):



Your Furnace:

Your Furnace PASSED worst case scenario and PASSED in natural conditions.

Furnace Carbon Monoxide (CO):



CAZ Depressurization Limits:

Appropriate airflow and pressure is necessary for proper venting of your combustion appliances. If there is too much negative pressure in the CAZ combustion gases may not have enough air to travel up the exhaust flue. The CAZ depressurization limit for your mechanically assisted draft boiler or furnace commonly vented with the water heater is -5.0 Pascals. Your home PASSED with a reading of -3.4 Pascals.

Combustion Appliance Zone:

The combustion appliance zone (CAZ) is where your combustion appliances such as your gas water heater and/or furnace are located. If your CAZ is located in a heated space or attached garage you are *required to have a CO monitor installed*. In the CAZ, we test your combustion appliances under the “Worst Case Scenario” and under “Normal Conditions”.

The Worst Case Scenario Test:

For the “Worst Case Scenario” test we setup your house with all the exhaust fans on and doors shut in an attempt to create an environment where the CO gases from your combustion appliances don’t have enough positive pressure to draft up the exhaust flue and end up spilling out into the CAZ. This is a potentially dangerous and even deadly situation. If your house fails under “Worst Case Scenario”, changes may be recommended or required to provide acceptable draft into the flue and/or reduce negative pressure within the combustion appliance zone (CAZ).

Normal Conditions Test:

Your CAZ is tested with the house under a normal “everyday living” environment. If your home fails under “Normal Conditions” changes are *required* to provide acceptable draft into the flue and/or reduce negative pressure within the combustion appliance zone (CAZ). Abacus Energy Solutions may issue a **“Stop Work”** order on energy improvements until the issues are resolved.

Water Heater

The design life of most water heaters is 13 years. It is advisable to replace a water heater if it is older than its design life rather than waiting until it unexpectedly breaks down. The condition of your water heater was judged as follows: GOOD (no replacement needed) FAIR (service/replace as desired) or POOR (service/ replace soon).

Water Heater Recommendations



Location:	Basement
Type:	Natural Gas
Age/ Design Life (years):	4/ 13
Size (gallons):	55 gallons
Recommendation:	Replace as desired

Your Natural Gas water heater was inspected to be in FAIR condition. A certified water heater technician will be able to provide you with a more detailed estimated lifespan. To find a preferred provide go to www.portlandenergysavers.com.

Other typical improvements you may consider for your water heater are earthquake strapping, insulating water pipes or upgrading to a more efficient model.

Is my Shower "Low-Flow"?

Here's a quick test to determine whether you should replace a showerhead:

1. Place a bucket—marked in gallon increments—under your shower head.
2. Turn on the shower at the normal water pressure you use.
3. Time how many seconds it takes to fill the bucket to the 1-gallon (3.8 liter) mark.

If it takes less than 20 seconds to reach the 1-gallon mark, you could benefit from a low-flow shower head.

Lower Water Heating Costs

According to the Department of Energy water heating can account for 14%–25% of the energy consumed in your home. Here are some easy ways to reduce that amount:

Water Heater Temperature

At Abacus Energy Solutions we recommend lowering the temperature of the water heater to 120° F. This saves energy and reduces the chance of scalding. If the hot water supply is insufficient at this setting, increase the water heater temperature by 5 degrees Fahrenheit and try it for a few days. CAUTION: If your dishwasher does not have a booster heater and your dishes do not come out clean, you should raise the water temperature to the setting recommended by the dishwasher.

Fix any Leaks

You can significantly reduce hot water use by simply repairing leaks in fixtures—faucets and showerheads—or pipes. A leak of one drip per second can cost \$1 per month.

Use Less Water

An easy way to save on your water heating expense is to use less water by taking shorter showers instead baths or replace your fixtures with low-flow aerators. Quality, low-flow fixtures sell for around \$10 to \$20 a piece and achieve a water savings of 25%–60%.

Buy ENERGY STAR® Appliances

When selecting a new water heater, dishwasher or washing machine, look for the ENERGY STAR® label.

Homeowner Notes:

Heating System

A heating system is expected to last from 20-30 years, depending on the system. If the system is nearing the end of its life, it is better to replace it sooner rather than later to avoid being without heat for several days when it fails. The condition of your furnace was judged as follows: GOOD (no replacement needed) FAIR (service/replace as desired) or POOR (service/ replace soon).

Furnace Recommendations



Location: Basement
Type: Furnace
Age/ Design Life (years): 2/ 20
Size (BTUs/hr): 50000 BTUs

Your Furnace Furnace was inspected to be in Good condition. A certified HVAC technician will be able to provide you with a more detailed estimated lifespan.

Your Furnace Efficiency (AFUE)

For more information on AFUE see the box to the right.

Your Furnace AFUE: 90
Overall System Efficiency: NOT TESTED
ENERGY STAR® AFUE: 85%
HEAT RISE TEST: NOT TESTED
Furnace OFF Temperature: NOT TESTED
Recommendation: None at this time

The Benefits of Upgrading your AFUE

Use the chart below to determine your dollar savings per \$100 spent on heating just by increasing your system AFUE.

		AFUE of New System			
		80%	85%	90%	95%
AFUE of existing System	50%	\$37	\$41	\$44	\$47
	55%	\$31	\$35	\$38	\$42
	60%	\$25	\$29	\$33	\$37
	65%	\$19	\$23	\$27	\$32
	70%	\$12	\$18	\$22	\$26
	75%	\$6	\$11	\$17	\$21
	80%		\$6	\$11	\$16
	85%			\$6	\$11

Source: American Council for an Energy-Efficient Economy.
www.aceee.org/Consumerguide/heating.htm

Furnace Efficiency or AFUE

Annual Fuel Utilization Efficiency (AFUE) is the most widely used measure of a furnace's heating efficiency. It measures the amount of heat delivered to your house compared to the amount of fuel that you must supply to the furnace. Thus, a furnace that has an 80% AFUE rating converts 80% of the fuel that you supply to heat -- the other 20% is lost out of the chimney. All Abacus Energy Solutions tests will identify the AFUE rating for your furnace; however, this number may not be your actual furnace efficiency.

Your Overall System Efficiency

The US Department of Energy (DOE) determined that all furnaces sold in the US must have a minimum AFUE of 78%. Unfortunately AFUE only takes into account the heat loss exiting the furnace and up the chimney. It does not measure the often significant heat loss through an insulated or leaky duct system. A furnace with an AFUE rating of 90 (90% efficient) may lose over 50% of that efficiency due to a poor duct distribution system. The Comfort Control with ENERGYSTAR® test by Abacus Energy Solutions will pinpoint the overall system efficiency of your furnace and duct system.

Comfort Control with ENERGYSTAR®

If you are concerned with your overall system efficiency, duct heat loss or complain of cool air delivery from your furnace, you should have your heating system fully tested using Abacus Energy Solutions' "Comfort Control with ENERGY STAR®". This testing procedure tracks your furnace efficiency from the furnace to each room of your house with the goal of maximizing the heat distribution and minimizing the heat loss. **Additional tests include: Overall System Efficiency, HEAT RISE, furnace OFF temperature and duct leakage and room pressure analysis.**

Common Problems that cause High Energy Costs and Sacrifice Comfort

Many homes have these problems which may go undetected by the homeowner without the proper *Home Performance with ENERGY STAR®* home assessment by Abacus Energy Solutions. The picture below highlights common problems found in homes.

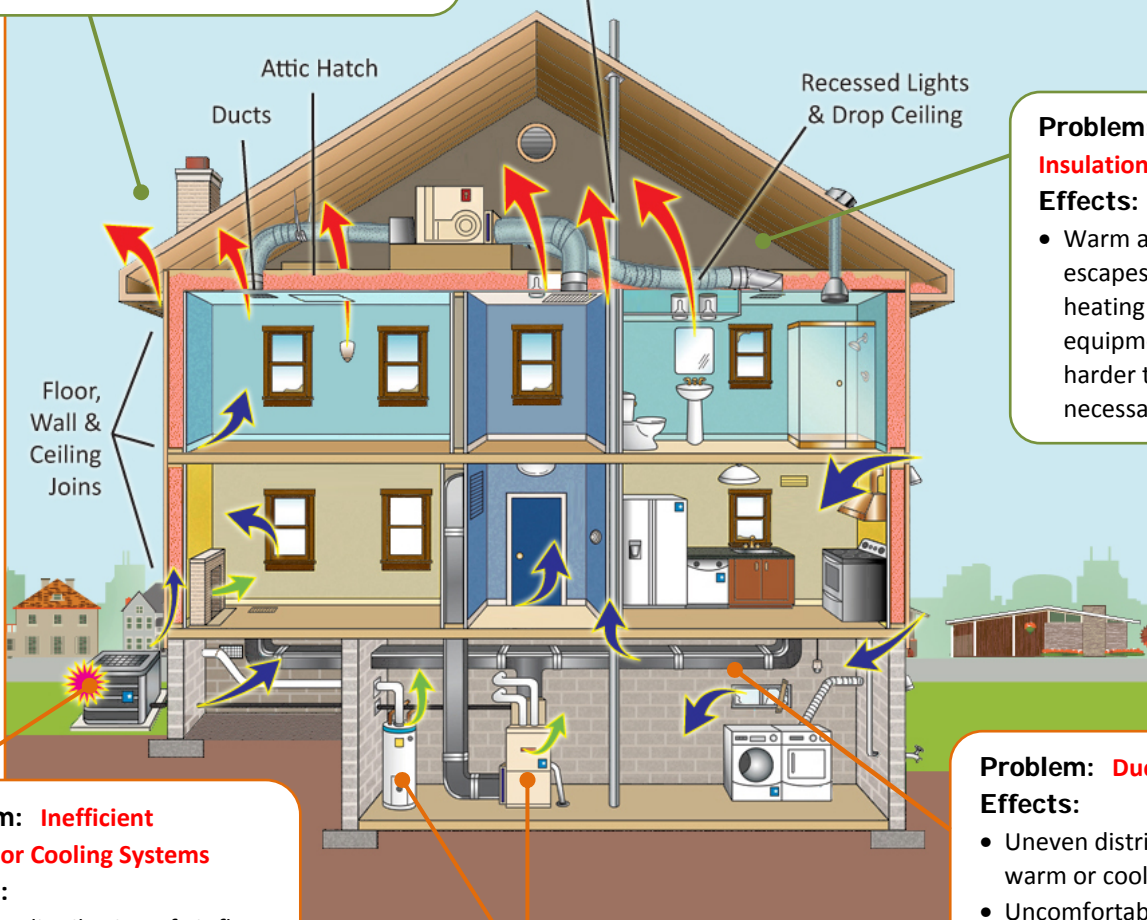
Problem: **Air Leakage**

Effects:

- Drafts and cold spots
- Overworking of heating & cooling equipment
- Moisture problems leading to peeling paint, mold or structural damage in attic or walls
- Inadequate air exchange causing unhealthy air quality, humidity or dryness

Guide to Common Leaks

- ← Air leaking from the outside
- Air leaking from the inside
- ↔ Carbon monoxide leaks



Problem: **Inadequate Insulation**

Effects:

- Warm and cool air escapes, causing heating & cooling equipment to work harder than necessary

Problem: **Inefficient Heating or Cooling Systems**

Effects:

- Uneven distribution of air flow
- Air and duct leaks or inadequate insulation cause system to work too hard, shortening the equipment lifespan

Problem: **Improperly Vented Appliances**

Effects:

- Dangerous carbon monoxide fumes can enter the living space

Problem: **Duct Leakage**

Effects:

- Uneven distribution of warm or cool air
- Uncomfortable room temperature
- Poor heating & cooling equipment performance

Solution:

With Home Performance with ENERGY STAR® testing your Abacus Energy Solutions auditor can find these issues and provide you with whole house solutions that save you money, protect your safety and increase your comfort.

Implementation and Contractors

Finding experienced, professional contractors and suppliers to implement home improvements was once a scary proposition but not anymore. Your Abacus Energy Solutions auditor will recommend the right contractors for the job and manage the entire project for you.

In 2009, Abacus Energy Solutions started *Portland Energy Savers.com* (www.portlandenergysavers.com) a network Oregon State certified contractors dedicated to providing homeowners with money saving, energy efficient home upgrades that will improve your home's comfort, health and safety. With the Portland Energy Savers preferred provider program you are guaranteed that your home-improvement contractor is working under the highest standards. To ensure our contractor quality and your actual energy savings ten percent of all our projects are inspected at random by the Energy Trust of Oregon. That is our commitment to your energy savings.

For more information on contracting services please visit www.portlandenergysavers.com or call 503-502-8834.

Weatherization Incentives & Tax Credits

ENERGY TRUST CASH INCENTIVES*

January 1, 2010–April 30, 2010

AIR SEALING

50% of cost, up to \$275 for gas-heated homes
50% of cost, up to \$400 for electric-heated homes

AIR LEAKAGE TEST

\$35 per site tested

DUCT SEALING

50% of cost, up to \$325 per duct system for gas-heated homes
50% of cost, up to \$400 per duct system for electric-heated homes
Requirements: Ducts must be in unconditioned space

DUCT LEAKAGE TEST

\$35 per duct system tested

WINDOWS

\$2.25 per square foot
Requirements: Must be installed with one other qualifying measure

INSULATION

Attic/ceiling: \$0.25 per square foot,
Walls, Floor and Kneewalls: \$0.30 per square foot
Duct: 50% of cost, up to \$100

POTENTIAL OREGON TAX CREDITS**

Effective January 1, 2010

POTENTIAL FEDERAL TAX CREDITS**

Effective January 1, 2010

No tax credit available at this time.

No tax credit available at this time.

No tax credit available at this time.

No tax credit available at this time.

25% of cost, up to \$250 (includes cost for duct leakage test)

No tax credit available at this time.

No separate tax credit (included in tax credit for duct sealing above).

No tax credit available at this time.

No tax credit available at this time.

30% of cost, up to \$1,500 Combined

No tax credit available at this time.

30% of cost, up to \$1,500 Combined.

* Incentive offer is subject to funding availability and may change. Visit www.energytrust.org/hes for current incentives and requirements.

**The information herein is subject to change. For current and accurate tax advice, you must consult with your tax professional.

Special Financing *Introducing GreenStreet Lending from Umpqua Bank.*

Energy improvements are unique because they create a stream of income in reduced monthly energy bills that may cover the monthly cost of the investment. Financing energy efficiency improvements as part of your home mortgage is a great way to go since the interest is tax deductible. Umpqua Bank also offers *GreenStreet Lending* special financing to customers of Abacus Energy Solutions. With *GreenStreet* you may qualify for an unsecured home improvement loan up to \$50,000 with a term up to 5 years.

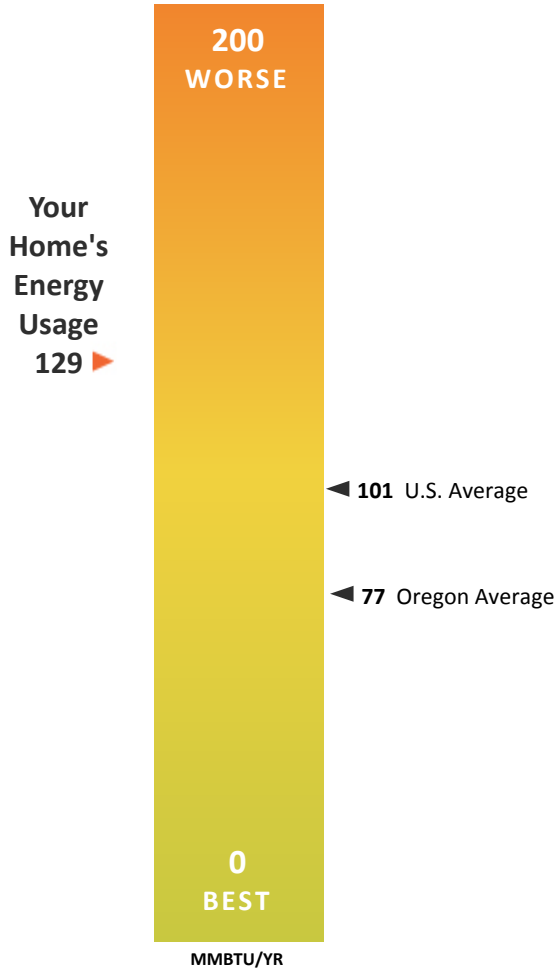


Your Home Energy Assessment

Below is your current annual energy consumption in British Thermal Units (BTUs). According to the *Energy Trust of Oregon* the average Oregon household consumes **seventy-seven million BTUs of energy per year**. Your home's energy consumption affects carbon emissions and impacts the environment. The second chart below shows an estimate of your home's carbon footprint based on your annual electric and natural gas consumption.

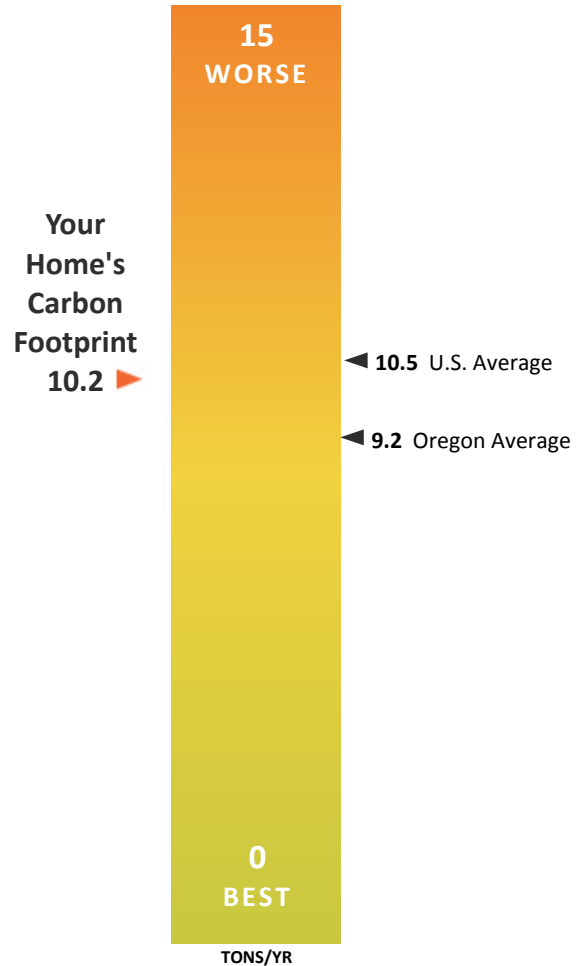
Energy Consumption

Measured in million BTU per year (MMBTU/yr).
A million BTU = 293 kWh or 10 therms.



Carbon Emissions

Measured in tons of carbon dioxide per year (Tons/yr). One ton = 2,000 miles driven by one car (typical 21 mpg car).



THIS ASSESSMENT WAS GENERATED EXCLUSIVELY FOR: Karen McDonald

ADDRESS: 1234 SW Main Street, Anytown, Oregon 97555

TEST: HOME PERFORMANCE with ENERGYSSTAR

TEST DATE: 9/20/2009

AUDITOR: John Smith

AUDIT ID: 1052

For more information on energy savings and other Abacus Energy Solutions testing options please visit www.PortlandEnergySavers.com