

The Wood Stove Checklist

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About the Checklist

This checklist is designed to assist residential energy auditors in providing recommendations to homeowners about their wood stove, which may be their primary or secondary heating system. The two most prominent energy auditor accreditors, **Building Performance Institute (BPI)** and **Residential Energy Services Network (RESNET)**, provide homeowners with the best guarantee that they will receive a thorough and professional energy audit. However, BPI and RESNET-trained auditors do not necessarily have any expertise in wood stoves. Wood stoves have often been left out of energy audits in rural areas. But it is important to include them, especially where wood stoves are a common and integral part of a home's heating system.

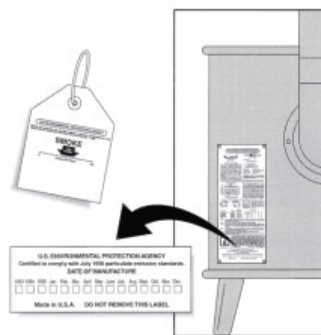
This checklist is produced by the Alliance for Green Heat, a non-profit educational organization, with funding from the University of Maryland Extension. If you have any comments or additions, email us at info@greenheat.org so that we can improve future versions. This checklist does not attempt to address wood or pellet boilers or pellet stoves.

How to Use this Checklist

This checklist is for energy auditors because it does not require testing tools, and it can also be used by homeowners. It is not meant to serve as a guide for repairing problems, but rather to identify potential problems. Chimney cleaning and inspection should be left to a professional chimney sweep. The checklist form at the back of this guide can be used or adapted by energy auditors as part of their written report for the homeowner.

The Basic Checklist

1) EPA Certification. One of the best things you can do for a homeowner is to confirm whether their stove is EPA certified. Almost all stoves made since 1988 are EPA certified and hopefully the homeowner will know this. Pellet stoves are not required to be EPA certified. Check the back of the stove to see if it has the EPA certification plate. If it's made before 1988, check to see if its UL listed.



Proof of EPA Certification can be found on the lower back side of a wood stove, as can a UL Listing Plate.

If the stove is not EPA certified or UL listed, it could be unsafe and potentially polluting. You should recommend an upgrade, especially if the homeowner burns a cord of wood or more each year.

2) Gaskets. Check the gasket around the door of the stove. Loose, degraded, or missing stove gaskets can lead to incomplete combustion, as well as wasted heat and fuel. If part of gasket is missing or loose, recommend having the gasket replaced.



Fixing missing, loose or degraded gaskets around the edge of the stove door is the most common repair for wood stoves.

Missing or degraded gaskets could lead to smoke and carbon monoxide entering the house. Stove gasket rope comes in many sizes, so check the owner's manual or a specialty hearth store for the right size before installing.

3) Clearances from combustibles. One of the most common dangerous situations with wood stoves occurs when the stove or flue pipe is installed too close to combustible surfaces. Stoves that are "listed" (safety tested by an independent laboratory) will have minimum clearance distances printed in the owner's manual. If you are unable to find the manufacturer's instructions, use the recommendations provided by the National Fire Protection Association (NFPA). Most unlisted stoves should be installed 36" from combustible walls. This clearance can be as little as 12" with the proper wall protection.

This is one area for energy auditors to easily assess, although the remedy is not necessarily easy or inexpensive. It's a particularly common problem with DIY secondhand stove installations. Secondhand stove sales rarely come with owner's manuals and manuals for old, uncertified and unlisted stoves are usually impossible to find. The state of Maine prepared a consumer guide for this:

www.maine.gov/dps/fmo/couments/2005Woodburningguide_001.pdf.

4) Glass. If the stove has glass on the door, it's likely that it's a newer, EPA certified stove. (Tempered glass only began to be used in the late 1980s.) Check to see how dirty the glass is. Blackened glass is a sign of poor combustion that is probably producing too much creosote. Recommend that the homeowner clean the glass every day to see how quickly it gets dirty. If it gets dirty in a single day, the combustion may be poor because the homeowner is using unseasoned wood, not giving the stove enough air and/or it's an old stove that is inefficient and needs to be replaced. Also, check for cracks in the

glass; cracked glass should be replaced. If the stove was manufactured after 1988, it is likely that the manufacturer is still in business and replacement glass and parts are available.



Dirty glass is a tell-tale sign that a stove is not operating the way it should. It usually means the operator is not giving the fire enough air and/or is using unseasoned wood.

4) Structural integrity and metal fatigue. If the stove is not EPA certified and made prior to 1988, this is a vital part of the inspection. Even certified stoves made since 1988 may have structural issues. Check to see if there are any cracks in the body or welds of stove. Look for cracks in the metal and especially cracks in the seams.

One way to check for cracks is to put a light bulb in the stove and see if you can see light on the outside. Make sure the stove is not rickety. Also check for metal fatigue. Signs of metal fatigue include rust and a whitish-greyish color that forms on the upper part of the stove. Metal fatigue is an indication that the stove has been used for a long time or was over-fired. Some manufacturers of older, pre-1988 stoves are still in business, such as Vermont Castings and Jøtul carry replacement parts.

5) Smoke and carbon monoxide alarms. Check to see if the home has an operational smoke detector and carbon monoxide monitor and test them. If not, it is highly recommended that the homeowner purchase both a smoke detector and carbon monoxide monitor. Like smoke alarms, carbon monoxide alarms should be on a ceiling or high on a wall, not plugged into a low wall socket.

6) The chimney. A clean chimney isn't always a safe chimney, but it's far better than a dirty one. Chimneys collect creosote, which is the leading cause of chimney fires. It's crucial that chimneys be inspected each year especially if the homeowner is burning a lot of wood. Remind the homeowner that if the wood stove was not installed by a professional or done without the appropriate permits, the insurance company may dispute a claim

arising from a chimney fire. Checking for creosote build-up in a fireplace is often very straightforward just by looking up a chimney with a strong flashlight. With a wood stove, creosote can be visible on the grate of the chimney cap, as in the photo below. Ask when the chimney was last cleaned and how often the stove is used.



Build-up of creosote is dangerous, even when it's not nearly as bad as this chimney.

Note that even the best wood stoves may need to have the chimney cap cleaned during the heating season, because when the hot exhaust hits the cold air it can cause particulates to condense on the screen. This is usually visible from the ground.

When recommending or hiring a chimney sweep, beware of the fly-by-night operations and hire a professional who is accredited by the Chimney Safety Institute of America (CSIA): <http://www.csia.org>.

BPI, Technical Standards for the Heating Professional (Last Revision: 11/20/07) says: "A deteriorated chimney must be repaired or relined and the cause corrected before reusing."

5) Firewood. Checking the fuel used in a stove may be regarded as outside the scope of an auditor's work. But unlike standardized liquid fuels, firewood is variable and a large percentage of Americans do not season their wood enough, leading to inefficient, smoky, creosote-producing fires. Ask to see the homeowner's wood supply to check whether its split and/or covered. Ask how long it has been since it has been split. Hardwood should be seasoned for a year after it has been split. Recommend that the homeowner split and stack the wood, and ideally cover the top as well (but not the sides) to protect it from rain and snow.



A good example of properly stacked wood: it is split, covered on the top (but not on the sides) and off the ground.

We recommend energy auditors bring a firewood moisture meter to see if the wood under 20% moisture content. If firewood is over 20%, it needs to be seasoned longer. If it was recently purchased from a dealer advertising seasoned wood, the homeowner can consider contacting the dealer for a refund.



Good moisture meters cost around \$80 and will give the homeowner vital information about their fuel. Remember to split a piece and test the inside, not the outside.

Wood Stove Installation & Repair Certification

The National Fireplace Institute (NFI) is a non-profit certification agency that trains, tests and certifies hearth professionals, mostly focusing on the installation of new units: <http://www.nficertified.org>

NFI professionals are not trained in energy audits but are the best professionals positioned to do an assessment of a wood stove and its interplay with other house systems.

Cost Savings with Wood

If your audit includes an assessment of potential cost savings by switching to another fuel – or just using a more inexpensive fuel more often – there are a variety of tools you can use.

One calculator we recommend is from the Energy Information Agency (EIA), a branch of the Department of Energy (DOE). If you are calculating based on an old, uncertified stove, the 55% efficiency provided by the EIA is a safe number. If the stove is EPA certified, use 65%. <http://www.eia.gov/neic/experts/heatcalc.xls>.

This calculator will not calculate the payback time for purchasing a wood stove based on the price of the fuel that it would be replacing.

Federal Tax Credit

As of Jan. 1, 2012, there is no longer any federal tax credit to purchase a new wood or pellet stove.

State Incentives

Three states offer tax credits or deductions for purchasing a new stove: Oregon, Idaho and Montana. New Hampshire and Vermont offer rebates for automated pellet boilers. For more: <http://dsireusa.org>.

Low-Income Energy Assistance

Families who receive energy assistance or another state assistance program may be eligible to have their wood stove repaired for free, or even replaced if it's beyond repair.

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