Frequently Asked Questions

EPA's Hydronic Heater Voluntary Partnership Program

In January 2007, EPA launched a voluntary program to make cleaner hydronic heaters (also called outdoor wood heaters or outdoor wood boilers) available for consumers. In the first phase of the program, manufacturers produced 15 units that are 70 percent cleaner than unqualified models.

Less than two years later, EPA moved to Phase 2 of the program, aimed at making models available that are 90 percent cleaner than unqualified units. Six of the original 15 models met the Phase 2 levels when EPA announced the program in October 2008. To date, there are 23 Phase 2 qualified models.

About Cleaner Hydronic Heaters

What is a Hydronic Heater?

- Hydronic heaters heat water that is piped to a nearby building (usually a home), providing both heat and hot water to the structure. An outdoor wood-fired boiler, which is sometimes called an outdoor wood heater, is an example of a hydronic heater.

- These heaters can be located inside or outside of the building to be heated. Hydronic heaters may use other biomass as fuel, such as corn or wood pellets. The EPA voluntary program does not include gas, oil, or coal at this time. An outdoor hydronic heater resembles a small shed with a short smokestack. An indoor hydronic heater typically is located in the basement, but some are located in the living area.

- Most hydronic heaters are sold for use in rural, cold climate areas where wood is readily available; however, they can be found throughout the United States.

Are outdoor wood-fired heaters a problem?

- They can be. Many outdoor wood heaters are significantly more polluting than other home-heating devices. They can create heavy smoke, which can be a nuisance, in addition to posing risks to public health in populated areas. This is most likely when heaters are used improperly or located too close to homes. Heaters that are qualified under EPA's voluntary hydronic heaters program are significantly cleaner.

How much cleaner are the new heaters than current outdoor wood heaters?

- Units that have a white hangtag meet EPA's Phase 2 emission levels and are 90 percent cleaner than unqualified units.

- Units that have an orange hangtag meet EPA's Phase 1 emission levels and are 70 percent cleaner than unqualified units.

What kind of pollution comes from outdoor wood heaters? How much?

- Wood smoke contains a number of pollutants, the more prevalent of which is fine particles (PM 2.5).

- Most unqualified outdoor wood-fired heaters emit about 2 pounds of fine particle pollution per million BTUs of heat input (i.e., wood burned) -- or about 0.83 tons per year.

- White hangtag units (those qualified under Phase 2 of EPA's voluntary program), must emit no more than 0.32 pounds of fine particles per million BTUs of heat output.

What are the health effects of smoke from hydronic heaters?

- Wood smoke contains both fine particle pollution (PM 2.5) and a number of air toxics. Fine particle pollution is linked to a variety of health problems, including aggravated asthma, reduced lung function, development of chronic bronchitis, irregular heartbeat, non-fatal heart attacks and premature death in people with heart and lung disease. Children, people with heart and lung disease, and older adults are the most vulnerable to the effects of fine particle pollution.

- Residential wood combustion emissions also contain the harmful air pollutants sulfur oxides, nitrogen oxides, carbon monoxide, and air toxics such as potentially cancer-causing compounds including polycyclic aromatic hydrocarbons, benzene, formaldehyde and dioxins. Some of these pollutants are known to cause cancer but their effects on human health via exposure to wood smoke have not been extensively studied.

Several manufacturers of outdoor wood heaters have said the existing heaters are as clean as indoor wood stoves. Is this true?

- No. When we determine how clean or polluting a unit is, we look at total emissions per hour, along with stack heights and proximity to other structures to estimate emissions and their impact on air quality and health. Current outdoor wood heaters burn significantly more wood than wood stoves -- often 10 times as much or even more. As a result, they emit much more smoke – and that means more particle pollution. Outdoor wood heaters also typically have short stacks that are close to nearby structures, meaning that the stacks are not usually above the roofline. As a result, wood heater emissions do not disperse as well as the emissions from typical wood stoves.

Is it true that to qualify under the EPA voluntary program, a hydronic heater must emit less than a typical EPA-certified non-catalytic indoor wood stove?

- No. The test methods used for hydronic heaters in EPA's voluntary program and for indoor wood stoves in EPA's New Source Performance Standard (NSPS) are closely related, and both originated from the same method but there are differences. The wood stove NSPS emission standard cannot be directly compared with the hydronic heater qualifying emission level, however, because the measurement units are different. Over 85% of non-catalytic woodstoves sold in the US today not only meet the NSPS but emit less than 4.5 grams per hour and some models emit only 1 or 2 grams per hour. A typical Phase 1 qualifying heater emits 4 to 10 times more particle pollution than a typical new non-catalytic wood stove and a typical Phase 2 qualifying heater emits 1.5 to 3 times more than a typical non-catalytic wood stove.

Do all areas allow hydronic heaters? How do I find out?

- Not all areas allow the use of hydronic heaters. And some areas allow their use but regulate emissions, opacity, location, and stack height. Your state or local air agency can tell you what your area allows. For information on how to reach your air agency, visit EPA's website at www.epa.gov/burnwise /appliances.html#outdoorwoodboilers and click on "Where You Live."

What states and local governments regulate or ban hydronic heaters now?

- Many states and local governments use nuisance or opacity regulations to regulate hydronic heaters. A number of local governments ban new hydronic heaters and/or regulate the minimum distance they can be sited from neighbors or public areas. Five states -- Connecticut, Maine, New Hampshire, Washington, Oregon, New York and Vermont -- have new regulations specific to heater use, and numerous states are considering regulations. Visit www.epa.gov/woodheaters, and click on "Where You Live," to learn more about state air programs and regulations for hydronic heaters.

About the Voluntary Program

Why has EPA created a voluntary program instead of regulating these heaters?

- EPA wants to reduce emissions from these heaters as quickly as possible. EPA's voluntary program has helped bring cleaner heaters to market several years faster than a traditional federal regulation process.

- EPA also provided technical and financial support for NESCAUM to develop a model rule that state, local and tribal governments can tailor to address their specific needs and concerns.

- EPA is currently developing revisions to the residential wood heater standard, which will includes a standard for new hydronic heaters. It is scheduled to be proposed for public comment in January of 2012.

Is EPA encouraging the use of hydronic heaters?

- EPA does not encourage the sale of any particular heating device. However, we urge consumers who choose to purchase a hydronic heater that uses wood or other biomass as fuel to buy one of the cleaner units that qualify for EPA's voluntary program.

How many manufacturers have agreed to make cleaner units? How many models have orange hangtags? How many models have white hangtags?

- Twenty manufacturers have agreed to use their best efforts to make cleaner models. These manufacturers represent more than 80 percent of the current sales in the United States. To date, 23 models have qualified at the Phase 2 white hangtag level, meaning they are 90 percent cleaner than unqualified units.

- Currently qualified models and their emission levels are listed on the EPA web site. Check the list frequently for updates.

Who verifies the manufacturers' emission performance results?

- Participating manufacturers have their heaters tested by independent EPA-accredited laboratories and the test reports are reviewed by EPA staff.

How can a manufacturer join the partnership?

- Review the Partnership Agreement on the website and then contact EPA at aldridge.amanda@epa.gov to apply as a new partner.

Information for Consumers

Should I replace my old outdoor wood boiler or hydronic heater?

- Yes. If you have an old model, consider replacing it with a Phase 2 hydronic heater or a cleaner heating device.

How do I know which units are the cleanest?

- Look for a white hang tag that indicates the unit meets the Phase 2 performance level of EPA's voluntary program. These heaters are 90 % cleaner than unqualified models. These heaters are also marked with a permanent label. Pictures of the labels and tags are on EPA's website.

- After March 31, 2010, units that have an orange hangtag, which are Phase 1 models, are no longer considered qualified models under the Voluntary Program.

Where can I purchase a cleaner hydronic heater?

- Manufacturers sell directly to the public and also through dealers. A list of qualified models and manufacturers is available on the EPA web site.

How much does a hydronic heater cost? Will a cleaner heater cost more?

- Hydronic heaters fueled by wood, pellets and other biomass cost between $8,000 and $18,000, depending on the size of the unit. The cleaner units may be more expensive – about 15 percent more – because of the changes made to improve the efficiency of these units and reduce their emissions. However, most of these new models are significantly more efficient – meaning they will use less wood to produce the same amount of heat, reducing the cost of wood purchases.

Can I retrofit my existing wood-fired heater to make it cleaner?

- Some heater manufacturers and manufacturers of emission control devices are working on developing retrofits for wood heaters. One model is currently available; however, it has not yet been tested by an accredited, independent, third-party lab. EPA is encouraging the manufacturers to continue retrofit development and testing efforts.

Does it matter what people burn in hydronic heaters?

- Yes! Use of the wrong fuels in a hydronic heater can decrease the efficiency of your heater, increase pollution, and sometimes can be dangerous. If you have a hydronic heater, only use fuels recommended by the manufacturer – such as seasoned, untreated wood.

- In addition, EPA urges owners of these devices to ensure that they are properly located, operated, and maintained. Short stacks and improper location too close to buildings and too close to neighbors can increase the amount of pollution to which people are exposed.

What about driftwood?

- Never burn driftwood – in a hydronic heater or any other kind of fire. Burning driftwood may produce harmful gases (like chlorine). It can also corrode the appliance and may void your manufacturer's warranty.

What can I do to burn cleaner and more efficiently?

- Follow the manufacturer's recommendations, especially fuel quality, loading times, and amounts. Visit EPA's website for more information and recommendations for safe wood burning practices at www.epa.gov/woodheaters.