

May 5, 2014

Gina McCarthy, Administrator
U.S. Environmental Protection Agency
EPA Docket Center
Mail Code 2822T
1200 Pennsylvania Avenue, NW
Washington, DC 20460
Attn: Docket ID No. EPA-HQ-OAR-2009-0734

Via Email: a-and-r-docket@epa.gov

Re: New Source Performance Standards for Residential Wood Heaters

Dear Administrator McCarthy:

The Northeast States for Coordinated Air Use Management (NESCAUM) offer the following comments on the U.S. Environmental Protection Agency's (EPA's) Proposed Rule, published on February 3, 2014 in the Federal Register, entitled *Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces, and New Residential Masonry Heaters* (79 Fed. Reg. 6330-6416). NESCAUM is the regional association of air pollution control agencies representing Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. These comments reflect the views of all NESCAUM member agencies except the Maine Department of Environmental Protection (DEP). Maine DEP will be submitting separate comments on the Proposed Rule.

In brief, we agree that EPA's proposed Step 2 emission standards are consistent with the "best system of emission reduction" (BSER) as defined under Clean Air Act (CAA) § 111(a) for New Source Performance Standards (NSPS). We urge EPA to finalize and implement Step 2 emissions standards as quickly as reasonably possible, and no longer than the implementation timelines proposed in EPA's preferred approach. We also support the proposed improvements to certification testing procedures and requirements for using pellet fuel certified to the EN Plus standard to ensure that real-world exposures to emissions of air toxics are reduced.

While the proposed rule does not set efficiency standards, we support the requirements for standardized efficiency testing and reporting to inform consumer purchase decisions. These provisions of the NSPS proposal are consistent with recommendations by the nation's state environmental commissioners in their 2012 Environmental Council of States (ECOS) resolution regarding new source performance standards for residential wood burning devices (Attachment A).

NESCAUM supports EPA's efforts to craft a rule incorporating a reasonable approach that provides industry with both time and flexibility to comply with its requirements. Specifically, EPA proposes a two-step approach that utilizes an initial phase, which does not represent BSER but rather immediately levels the regulatory playing field for all residential

wood burning devices, and then sets a Phase 2 BSER standard five years into the future. This five year period provides industry with ample time to meet the proposed emission standards, which are already being achieved today by at least 10% of the industry while recognizing that some companies will need time to redesign and retool to produce units that meet the Phase 2 limits. NESCAUM believes that reducing emissions and increasing efficiency with improved technologies is a win for the environment, the consumer, and the industry.

Burning wood cleanly requires three elements: (1) well designed devices, (2) appropriate fuels, and (3) proper owner operation. If not met, any of these elements can create an air pollution problem. NESCAUM supports EPA's efforts in this proposed rule to address all of these elements. NESCAUM's comments on specific parts of the proposed rule are provided in the following sections.

Using Gross Domestic Product (GDP) as indicator of future wood use

EPA is requesting comment on the shipments of units and wood use using gross domestic product (GDP) as an indicator of future use. NESCAUM supports the use of information from U.S. Energy Information Administration (EIA) forecasts as a predictor rather than anticipated GDP.

Wood is a fast growing source of indigenous heating fuel nationwide. An analysis by EIA shows that significant growth has occurred in the Northeast, where states have experienced a 60% to 160% increase in number of households that rely on wood as their main heating source (see Figure 1 below).¹ As shown in Figures 1 and 2, use of wood for heating purposes has grown at large rates in the Northeast states even when the economy has lagged. This historical experience suggests that projected GDP trends will not necessarily correlate well with wood use trends.

The analysis by EIA shows that in 2012 approximately 2.5 million households used wood as their primary home heating fuel, a 31% increase from the 1.9 million households using wood for primary heating in 2005. An additional 8% of households, or 9 million homes, use wood as a secondary heating fuel. This translates into wood heat in the residential sector having a similar consumption rate to propane and a slightly lower rate than fuel oil. Higher income households are more likely to use a wood burning appliance, while lower income families who do burn wood consume more on average.

¹ U.S. Energy Information Administration (EIA). *Increase in wood as main source of household heating most notable in the Northeast*, Today in Energy (March 17, 2014). Available at <http://www.eia.gov/todayinenergy/detail.cfm?id=15431>.

States with highest percentage increase in homes using wood as main heating source (2005-12)
 percent

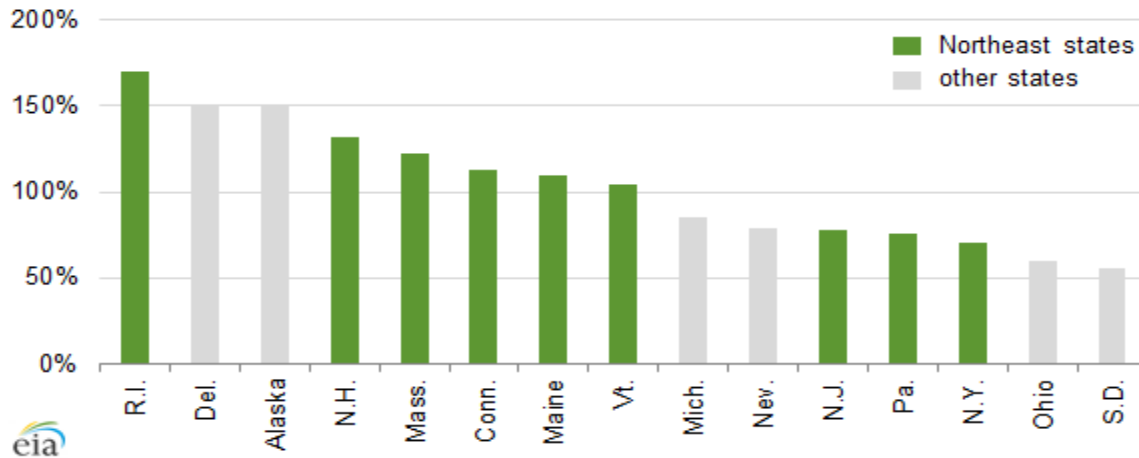


Figure 1. Northeast Homes Using Wood as their Primary Heating Source
 Source: U.S. Census Bureau, 2005 and 2012 American Community Survey

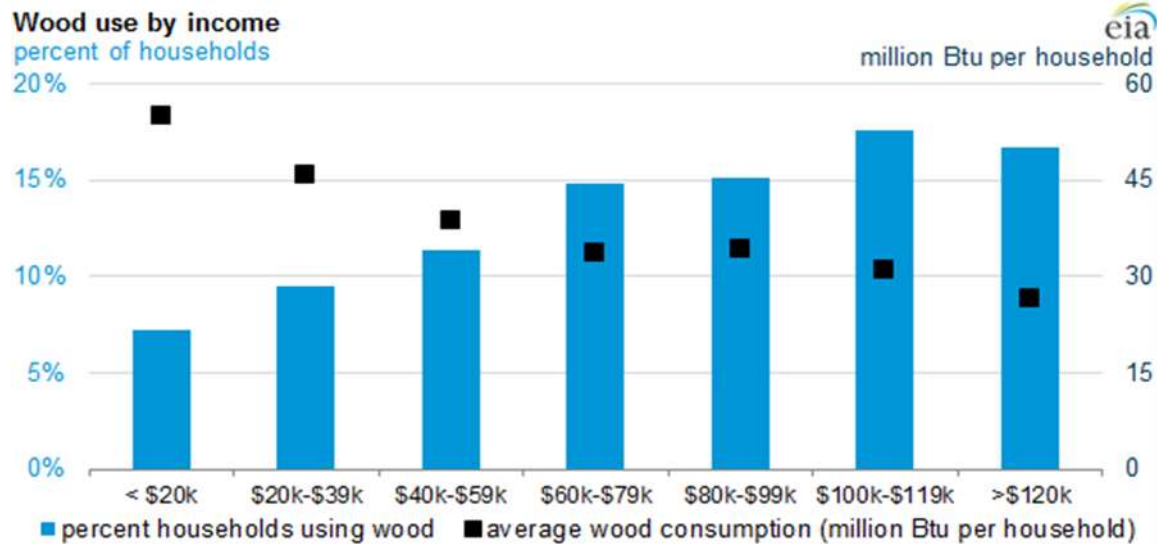


Figure 2. Use of Wood Heating Appliances by Income
 Source: U.S. Energy Information Administration, 2009 Residential Energy Consumption Survey

As seen in the EIA data, the number of Northeast households heating with wood has greatly increased, and the market has expanded with a variety of new unregulated device types since promulgation of the first residential wood heater NSPS. This in turn has increased the public health risk from exposure to wood smoke. Residential wood combustion is the largest direct source of particulate matter (PM) emissions in the country, emitting an estimated 340,000 - 600,000 tons of fine particulate matter (PM2.5) annually. It is responsible for 44% of all

human-related polycyclic organic matter (POM) emissions and 62% of the 7-polycyclic aromatic hydrocarbon (PAH) emissions, which have been identified as probable human carcinogens.²

Wood smoke pollution occurs in locations and at times where the public's exposure is greatest – at home and in neighborhoods where people live. Studies have correlated acute and chronic wood smoke exposure with adverse health outcomes, such as increases in respiratory symptoms, decreases in lung function, premature death in people with lung or heart disease, nonfatal heart attacks, and aggravated asthma.³ These health threats make implementation of this rule critical, as well as long overdue.

In the NESCAUM region, air pollution from residential wood combustion has a disproportionate impact due in large part to the Northeast's colder climate and the relative abundance of wood. Residential wood combustion is the largest or one of the largest sources of PM in Northeast locales, ranging from 20% to 75% of ambient PM levels.

Studies conducted by the Vermont Department of Environmental Conservation and NESCAUM have found that during the coldest and calmest winter days in Rutland, Vermont, wood smoke accounts for half or more of the measured PM_{2.5} pollution.⁴ In the first two months of 2014, Rutland experienced daily PM_{2.5} concentrations of about 20 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) – nearly twice the level of the annual PM_{2.5} National Ambient Air Quality Standard (NAAQS) of 12 $\mu\text{g}/\text{m}^3$. During this same period, the area also experienced maximum hourly concentrations greater than 35 $\mu\text{g}/\text{m}^3$ on more than half the days, with peak hourly concentrations exceeding 90 $\mu\text{g}/\text{m}^3$. These results are consistent with studies in the Adirondacks by NESCAUM which have shown significant localized pollution from wood burning.⁵

These findings are not isolated to mountainous areas. Studies in Connecticut have found that on cold winter days when ambient concentrations of PM_{2.5} are elevated, observed wood smoke contributions to hourly PM_{2.5} are over 50%.⁶ Data from these efforts suggest that residential wood smoke affects public health on a daily and long-term basis in these areas.

While PM_{2.5} pollution levels approaching the 24-hour NAAQS are a pressing problem, this standard does not fully capture the full public health impacts of wood smoke. Research has found associations between shorter period PM_{2.5} peaks lasting from minutes to hours with acute cardiovascular and respiratory events, including myocardial infarction in older adults and asthma symptoms in children (a listing of health-relevant studies is given in Attachment B). Short-term spikes in wood smoke PM_{2.5} associated with individual residential wood heating devices, such

² EPA. *Strategies for Reducing Residential Wood Smoke*, EPA OAQPS, Research Triangle Park, NC, EPA Document # EPA-456/B-09-001 (September 2009), p. 4. Available at <http://www.epa.gov/burnwise/pdfs/StrategiesDoc8-11-09.pdf>.

³ Naeher, L.P. et al., *Wood Smoke Health Effects: A Review*, Inhalation Toxicology, 19:67-106, 2007.

⁴ Allen, G.A., P. Babich, and R. Poirot. *Evaluation of a New Approach for Real Time Assessment of Wood Smoke PM*, Paper #16, presented at the Air & Waste Management Association Visibility Specialty Conference on Regional and Global Perspectives on Haze: Causes, Consequences and Controversies. Asheville, NC (October 25-29, 2004). Available at: http://www.nescaum.org/documents/2004-10-25-allen-realtime_woodsmoke_indicator_awma.pdf.

⁵ Miller, P. et al. *Spatial Modeling and Monitoring of Residential Woodsmoke Across a Non-urban Upstate New York Region*, NYSERDA Report 10-02 (February 2010). Available at http://www.nescaum.org/documents/spatial-modeling-and-monitoring-of-residential-woodsmoke-across-a-non-urban-upstate-new-york-region/nyserda-spatial_modeling_monitoring_residential_woodsmoke-201002.pdf.

⁶ Connecticut Dept. of Environmental Protection, Bureau of Air Management. *Evaluation of Wood Smoke Contribution to Particle Matter in Connecticut* (February 7, 2011). Available at http://www.ct.gov/deep/lib/deep/air/wood_stove_furnaces/ctdep_woodsmokefinalreport.pdf.

as outdoor wood-fired boilers, can affect public health even when the 24-hour PM_{2.5} standard is not exceeded.

With EPA's estimated monetized health benefits of greater than \$4 billion annually and costs of \$16 million annually, the proposed standards have a benefit-to-cost ratio of greater than 100 to 1. At an estimated cost of \$281 per ton of PM reduced for room heaters and \$74 per ton PM reduced for central heating, the proposed NSPS is among the most cost effective control strategies available for this pollutant.⁷

This is a conservative benefit-to-cost estimate, as EPA's cost analysis uses industry estimates that NESCAUM finds generous. EPA's analysis used an estimated cost of \$380,000 to redesign an appliance model. Data supplied by industry into the docket show a range of redesign costs from \$10,000 to \$486,000 per model. Therefore, EPA is using the higher end of redesign costs expected by industry.

Additionally, EPA has used a 2% rate to forecast industry growth but recent industry data suggest that between 2012 and 2013, the industry grew at a rate of 12% to 15% (Attachment C). Based on these data, we believe that EPA may be underestimating future growth in this sector.

Comments on Proposed Emission Standards and Covered Device Types

The current NSPS regulations for wood burning devices exempt broad categories of devices, including a number of pellet stoves, outdoor/indoor wood boilers, outdoor/indoor wood furnaces, and masonry heaters. NESCAUM supports efforts to create inclusive requirements for residential heating equipment and to develop source category definitions that eliminate source category loopholes, ensuring that all residential wood heating devices are required to meet an emission standard both when built and when used.

Availability of Emissions Data

It is our understanding that industry provided EPA with the data used to analyze the proposed emission standards. Because of the standard industry practice of submitting all test data, including emissions information, as confidential business information (CBI), NESCAUM is not currently able to analyze the full data set for space and central heating devices. NESCAUM has requested this information from the EPA Office of Enforcement and Compliance Assurance (OECA).⁸ We are seeking basic data that do not raise confidential business information concerns, such as manufacturer names and model numbers, test methods used, technology descriptions for the units, emission rates by burn categories (if Method 5G is used, EPA should provide emission rates as Method 5G and Method 5G_{adj}), burn rates, and duration of tests. EPA should provide such information in a timely manner that allows NESCAUM and others to provide additional input on where EPA's proposed standards may be strengthened to better protect public health. The future rule must ensure that only information that is truly confidential is treated as CBI. Per EPA's Office of General Counsel, emissions data from wood combustion tests are not confidential data (*see* Attachment D), and any test reports that are submitted with these data as CBI should be immediately rejected.

⁷ Presentation materials provided to NESCAUM by EPA on March 28, 2014 conference call.

⁸ NESCAUM. Freedom of Information Act Request to EPA Office of Enforcement and Compliance, April 2, 2014. Available at <http://www.nescaum.org/documents/nescaum-foia-request-oeca-wood-nsps-20140402.pdf>.

Best System of Emission Reduction (BSER)

NESCAUM notes that EPA has recently proposed NSPS rules for greenhouse gases emitted by new fossil fuel-fired electric utility generating units that interprets BSER, as defined under CAA § 111, to include technology innovation considerations.⁹ NESCAUM agrees that BSER incorporates Congress' intent in the Clean Air Act to promote implementation and further development of technologies beyond what may currently be available. NESCAUM believes that EPA has been generous in allotting five years to meet the BSER requirement and this timeframe might be shorter. NESCAUM urges EPA to examine the possibility of a shorter timeframe to a Step 2 standard.

Regulatory drivers have led to technology advances that otherwise would not have occurred. For example, Vermont's experience with implementing outdoor wood boiler regulations has shown that industry can achieve cleaner standards when required to do so. When Vermont moved to set emission standards for outdoor wood boilers at 0.44 lb/mmBtu, the largest manufacturer of these units testified before the Vermont legislature that the emission standards were unachievable. Contemporaneously with this testimony, the company had already developed and tested a unit that met the proposed standard.¹⁰ Within three years of promulgating Vermont's emission standard of 0.44 lb/mmBtu standard, the same company had already tested two units¹¹ that can already meet EPA's proposed Step 2 standard in this rulemaking.

EPA should ensure that BSER for this rule truly represents the technology development potential for the covered sources, and not break with its own previous interpretation of BSER. It should promulgate emission standards that reflect the technology innovation opportunity rather than the technology status quo that has been in existence for decades.

Particulate Matter Emission Standards

NESCAUM supports updating particulate matter (PM) standards for previously regulated wood burning devices, and eliminating loopholes for devices not covered under the 1988 regulations. EPA should promulgate a regulation that requires all residential wood heating devices to meet an emission standard. We also support EPA's efforts to unify standards based on heating purpose, i.e., space heating versus central heating, and moving away from regulating based on location (indoor versus outdoor) or emission control technology employed (catalytic versus non-catalytic). States have experienced difficulties in regulating based on whether a unit is placed indoors or outdoors, or if it heats water or air. NESCAUM supports EPA's effort in this proposed rule to recognize the reality that all units must provide similar emissions performance regardless of their installation location or emission control method.

Implementing emission standards as soon as possible for previously exempted devices, such as hydronic heaters, furnaces, and single burn rate stoves, is critical to obtaining air quality

⁹ *Standards of Performance for Greenhouse Gas Emissions From New Stationary Sources: Electric Utility Generating Units*, 79 Fed. Reg. 1430-1519 (January 8, 2014), at 1434.

¹⁰ Barlow, D. (Vermont Press Bureau). *Outdoor wood boiler meets Vermont emission standards*, Rutland Herald, May 5, 2007. Available at: <http://www.rutlandherald.com/apps/pbcs.dll/article?AID=/20070505/NEWS03/705050349/1004/NEWS03>.

¹¹ Under the proposal, EPA proposes a test method that requires obtaining measurements on the load side of the boiler but some of the existing information from the Voluntary Program includes supply side data. The two units identified as meeting the Step 2 standard are based on calculations boiler load side, which does not match the data in EPA supplied information.

benefits. Currently, the estimated 100,000 exempt devices that are sold annually receive an economic advantage over regulated devices while creating significant smoke and health problems around the region. We urge EPA to immediately implement standards for previously exempted devices as proposed in the rule.

NESCAUM supports EPA's efforts to move away from emission standards that average across burn rates. Having devices comply with the standard across all burn rates will assure that compliance is continuous rather than intermittent, as required by EPA's Stack Testing Policy. More information on this topic is provided in the Test Method Section of these comments.

NESCAUM concurs with EPA's preferred, two-step approach in establishing NSPS for wood burning devices. Using the three steps in the alternative approach is problematic for two reasons: (1) ensuring installation of compliant devices becomes exponentially more difficult as the number of steps increases, and (2) the three step approach pushes compliance to the date when the next NSPS review is due. The Clean Air Act requires EPA to review and, if appropriate, revise an NSPS at least every eight years. The timeline of the three step approach appears to pre-determine the outcome of the statutory obligation EPA has to revisit the NSPS within the CAA's eight year requirement.

EPA should also provide a publicly accessible data set that includes information on emission rates for all devices in the format that the new rule will use. Under the current rule, EPA requires that space heating units tested with Method 5G utilize a correction factor to meet the current emission rate; this is known as Method 5G_{adj}. This correction factor inflates emission rates. If EPA moves forward with removing this correction factor in the new rule, EPA needs to provide to the public all emissions data and clearly identify whether the emission rates presented are Method 5G or Method 5G_{adj}. Also EPA must revise the data set for central heating units to assure that emission rates for hydronic heaters reflect load side measurements, as proposed in the rule, as opposed to supply side data.

Step 1 Emission Standards

CAA § 111(b)(1)(B) states that EPA shall review and, if appropriate, revise NSPS standards at least every eight years and promulgate rules within one year after publication of proposed rules, with the standards of performance or their revisions becoming effective upon promulgation. CAA § 111(b) clearly requires standards consistent with BSER immediately upon promulgation. While NESCAUM would like to see BSER standards in place immediately, states and EPA have recognized that manufacturers need time to redesign, retool, and test devices that meet BSER standards. EPA has granted industry this flexibility by creating a phased approach. NESCAUM recognizes that the Step 1 emission standards, as proposed, do not represent the most advanced, lowest polluting wood burning residential appliances currently available in the marketplace. According to available emissions information for wood-fired room heaters and hydronic heaters, all hydronic heaters that qualified for EPA's 2010 (Phase II) voluntary emission reduction program already meet the proposed Step 1 emission standard for weighted-average emissions and most (approximately 90%) room heaters meet the proposed Step 1 weighted-average emission limit. NESCAUM recognizes that the Step 1 standards are merely a glide path to move currently unregulated markets into the regulatory schema and provide industry with time to redesign their devices to meet a BSER standard in Step 2. NESCAUM generally supports this approach so long as the Step 1 standards are only transitory standards to be timely replaced by Step 2 standards reflecting BSER.

NESCAUM supports the Step 1 emission standards as proposed with exception of the furnace and woodstove standard. The proposed standard of 0.93 lb/mmBtu is too high, even for a transitory standard. At the proposed Step 1 standard, these devices would be allowed to emit at emission rates approximating 80 grams per hour. Allowing sale of such high polluting devices will have significant consequences because residential heating devices, once installed, continue to be used for decades. NESCAUM recommends that EPA revised the Step 1 emission standard for furnaces to 0.40 lb/mmBtu with no test run to exceed 15 grams per hour, which is the same standard enacted as a Phase 1 in the model rule used by many states to regulate outdoor wood boilers in their state regulations. NESCAUM also recommends that EPA lower the indoor woodstove standard for Step 1 to 3.5 grams per hour. This standard, while not BSER,¹² will result in installation of cleaner devices to the transition period from Step 1 to Step 2.

Step 2 Standards

NESCAUM reviewed data for woodstoves and boilers and find that EPA's Step 2 emission limits represent emission standards that are achievable today. The Hearth, Patio and Barbecue Association supplied data showing that five catalytic woodstoves, four non-catalytic woodstoves, seven pellet stoves, and four central heating devices can meet the proposed standards. For exempt units where little emissions data are available, such as with furnaces and single burn rate stoves, compliance with the Step 2 standards can be achieved by transferring current emission control strategies employed by variable burn rate stoves and boilers. In addition, all units can utilize new technologies that are now available in Europe to further reduce emissions, such as oxygen sensors to vary air to fuel ratios, thermal storage, "smart control" technologies, and add-on control technologies such as residential electrostatic precipitators.

NESCAUM urges EPA to adopt a gram per hour cap for central heating devices, along with a lb/mmBtu emission standard, to ensure that large units do not emit at high mass rates over time. This will better protect public health.

We recommend that EPA promulgate Step 2 standards based on crib tests. Any move to an alternative test method needs to provide a clear correlation to the standards based on the crib fuel data set. Additional details on the use of alternative test methods are provided in the Test Method section of these comments.

Unified Standard for Device Types

NESCAUM supports EPA's efforts to harmonize and unify standards, specifically in creating standards based on device use (central versus space heating) and for catalytic and non-catalytic units. EPA typically sets emission standards for heating units based on heat output and fuel used. This allows market forces and manufacturer discretion to determine the technologies used to meet emission limits. In the original 1988 residential wood heater NSPS, EPA set a lower standard for catalytic units in the belief that emissions from catalytic units would increase over time due to decreasing capture efficiency of the catalyst while the non-catalytic units would not degrade. Studies since then, however, show that emissions performance of both device types

¹² Based on information provided by the Massachusetts Clean Energy Center for its woodstove change-out program, 76% of the stoves manufactured today can meet an emission standard of 3.5 grams per hour.

degrade over time.^{13,14} Furthermore, the dual standard implies that use of one or the other technology is the only way to meet the emission limits. In the market today, there are hybrid units that employ non-catalytic secondary combustion with catalytic technology. Some European units utilize electrostatic precipitators (ESPs) or variable air flow technologies to meet emission standards. These examples highlight the need for a standard that does not direct emission control strategies.

Finally, in the central heating category, recent state emission standards for outdoor wood boilers, such as those in Maine, Massachusetts, New York, and Vermont, do not differentiate between catalytic and non-catalytic units even though manufacturers have employed both control strategies. We fail to see why space heaters would need this bifurcation when other device types do not. By setting a control technology-specific emission standard, we may in fact be limiting technology options.

Warranty Requirement

The current rule has different warranty and durability requirements for non-catalytic and catalytic devices. This has created an unequal field of competition for these devices, making it more expensive to manufacture catalytic devices. Information from manufacturers demonstrated that warranty issues abound with all units, not just catalytic-equipped devices. Therefore, NESCAUM supports efforts by EPA to create minimum warranty and durability requirements across all devices similar to those currently required for catalytic units to provide stronger consumer protections for ensuring control devices will last throughout a product's lifetime.

Rule Applicability Determinations.

EPA, not manufacturers, should decide whether or not a device qualifies for any exemption from the requirements of this rule. Devices should be tested with all the allowable fuels they can burn. For example, a device labeled as a "coal stove" should not be exempt from certification requirements if it is capable of burning wood. A manufacturer must either test to the appropriate standard or provide data and supporting evidence that its units cannot be used to burn wood. This will eliminate a potential applicability loophole.

Carbon Monoxide Testing and Reporting

Wood heat technology has advanced significantly since EPA's existing standards were phased-in more than 20 years ago. Worldwide, many countries have enacted broad efforts to address wood smoke emissions from a variety of devices for a range of pollutants, whereas in the United States, regulations have only focused on particulate matter from woodstoves. For example, European countries have placed emission limits on particulate matter, carbon monoxide (CO), nitrogen oxides, and volatile organic compounds for all wood burning devices. These have

¹³ Houck, J.E., L.Y. Pitzman, and P. Tiegs. *Emission Factors for New Certified Residential Wood Heaters*, presentation at *17th Annual International Emission Inventory Conference "Inventory Evolution - Portal to Improved Air Quality"*, Portland, OR (June 4, 2008). Available at: <http://www.epa.gov/ttnchie1/conference/ei17/session4/houck.pdf>.

¹⁴ Nuefeld, C. *Biomass Heating With A Catalytic Wood Stove or Furnace*, presentation at Renewable Heating Symposium 2009 (April 15, 2009). Available at: <http://www.chc-hpba.org/images/Renewable%20Heat%20Symposium.pdf>.

resulted in technology performance improvements that have increased average fuel efficiency from 55% to more than 90%, while average CO emissions have decreased 99%.¹⁵ We support EPA's efforts to gather information on CO emissions and urge EPA to move beyond reporting to developing a CO standard for these devices. Furthermore, because CO standards are based on one-hour testing, EPA should adopt reporting on one-hour values rather than averages over the entire test period utilizing EPA's Federally Reference Method 10.

Efficiency Testing and Reporting

Typical annual efficiencies of domestically available residential wood heating products today have average annual efficiencies ranging from 25% to 70%. Although industry representatives have voiced concerns that the more stringent regulations will increase the cost of devices, NESCAUM supports efforts that consider costs holistically. More efficient combustion devices will save consumers' money by reducing fuel costs over the life of the device. EPA estimates place the additional up-front cost for a new stove at \$100.¹⁶ This up-front cost of cleaner, more efficient devices is typically less than 10% of the current price for a stove capable of heating 1,500 square feet or more.

Fuel savings from more efficient devices more than offset the purchase price increment, typically within six months of use. In addition, rebate programs can help cover the additional purchase cost. Maine, for example, provides a \$250 rebate on new woodstoves and Massachusetts has a program in place to provide a \$1,000 rebate.

Industry surveys indicate that efficiency plays a large role in a consumer's purchasing decision.¹⁷ Complete, credible, and accurate data will provide the consumer with the information needed to make an informed choice. Therefore, NESCAUM supports expanded reporting of not only particulate matter but also carbon monoxide and device efficiency.

NESCAUM has concerns that the efficiency method proposed will over-estimate efficiency for devices that cycle as it measures maximum theoretical emissions and does not penalize for periods when the unit is in smolder mode. NESCAUM requests that EPA work with the U.S. Department of Energy to create minimum efficiency standards for residential wood heating devices using the Canadian Standards Association (CSA) standard to expedite implementation. It is important to note that these are the only residential heating devices not currently subject to Department of Energy minimum efficiency standards.

¹⁵ Musil-Schl affer, B. et al. *European Wood-Heating Technology Survey: An overview of Combustion Principles and the Energy and Emissions Performance Characteristics of Commercially Available Systems in Austria, Germany, Denmark, Norway and Sweden*, NYSERDA Report 10-01 (April 2010). Available at: <http://www.nyserderda.ny.gov/Publications/Research-and-Development-Technical-Reports/Other-Technical-Reports/European-Wood-Heating-Technology-Survey.aspx>.

¹⁶ Industry estimates are higher, but industry historically tends to inflate cost estimates and fails to consider technology innovation. See, e.g., NESCAUM, *Environmental Regulation and Technology Innovation: Controlling Mercury Emissions from Coal-Fired Boilers*, NESCAUM, Boston, MA (Sept. 2000). Available at http://www.nescaum.org/documents/rpt000906mercury_innovative-technology.pdf.

¹⁷ Presentation provided by Hearthstone Industries at EPA Public Hearing, *Proposed Revisions to the Standards of Performance for New Residential Wood Heaters*, Boston, MA (February 26, 2014).

Visible Emission Standards

Ensuring proper owner operation once a wood burning device is installed is important to assure that units are operated properly in the field. Excessive smoke in well-designed units is often a sign of improper owner operation, therefore NESCAUM supports the inclusion of a visible emission standard in the final rule. While many states have opacity limits for units in commercial, industrial, and institutional settings, they typically do not apply to residential units.

In states where opacity regulations do apply to residential units, enforcement has been difficult due to resource constraints and limitations in conducting credible Method 9 tests. For instance, Method 9 requires specific observation conditions. A Method 9 test cannot be conducted on a unit's emissions at dusk or when it is dark.

Furthermore, under the current federal regulation, states have little to no authority to address operator requirements because under the current rule there are no provisions to delegate enforcement to the state or local agencies. Under the current rule schema, EPA regional offices would need to conduct an investigation involving a unit's operation. To date, EPA has not taken such action. Therefore, as a practical matter, the current operator requirements are unenforceable. NESCAUM supports EPA's efforts to allow states to take partial delegation of this rule. This will create the flexibility necessary for states and local health departments dealing with residential wood smoke problems to enforce federal requirements.

NESCAUM also supports the enactment of a visible emission limit, similar to those currently in place in New Jersey and Maine. We support a visible emission limit that defines a wood smoke nuisance as visible smoke passing onto a neighboring property for a period greater than six minutes in any rolling sixty minute period. This standard would allow the use of Method 22 *Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares*. Method 22 requires only the determination of whether visible emissions occur and does not require the determination of opacity levels. Therefore, observer certification according to the procedures of Method 9 is not required. This would allow affected neighbors to gather data to support wood smoke nuisance cases.

Currently Certified Units

EPA has proposed allowing EPA certifications of currently certified units to continue until their expiration date. Under the current rule, certificates have a lifetime of five years. This means that certificates would be expiring at various times throughout the first five years of the new rule. Given the variability in certification expirations, NESCAUM supports a blanket extension for all currently certified units (woodstoves and pellet stoves) that meet EPA's final Step 1 emission limits until implementation of Step 2 standards or until January 2020, whichever is earlier.

NESCAUM recommends that only those units already achieving the relevant proposed standards for Step 1 be allowed to delay re-testing. Additionally, NESCAUM supports the use of New York certifications for central heating devices for an interim period of two years. This blanket extension would save manufacturers money on re-testing existing units, and allow them to direct investments to make cleaner units for the Step 2 standards and address potential backlogs at testing labs. In return for the certificate extension, EPA should require that companies provide EPA with a complete cordwood test for these units within 18 months of promulgation of this rule. Units that do not comply with the Step 1 emission limits should not be allowed to be sold if their current certificate extends beyond the initial rule promulgation.

NESCAUM does not support extending certificates beyond the date Step 2 standards come into effect.

Sell Through

NESCAUM is concerned about the continued sale of high emitting devices. Once a device is installed, there is no authority to reduce emissions from these devices. EPA estimates that 100,000 exempt units are sold annually.¹⁸ Exempt devices (those not subject to a product emission standard) can have very high emission rates. A domestically produced, uncertified outdoor wood boiler can emit, based on EPA's own analysis, an average of 15 pounds of PM per day, or more than two tons of PM per year. For comparison, this is as much health-damaging particulate matter as emitted by 250,000 residential natural gas boilers. Therefore, NESCAUM supports EPA in not providing for any sell through of any uncertified central heating device upon promulgation of this rule.

NESCAUM also recommends that EPA eliminate sell through periods for exempt, uncertified woodstoves fueled with cordwood. For certified space heating units emitting greater than the Step 1 emission standard of 4.5 grams per hour and pellet stoves, NESCAUM supports a one year period to sell existing inventory. While EPA has proposed a six month sell through period, we believe that a one year sell through will provide ample time for retailers to sell devices and will assist in alleviating any logjam issues at testing labs.

NESCAUM also requests that EPA simplify and streamline the numbers of exceptions and sell through periods so that enforcement agencies charged with assuring compliance with the new emission standards will be able to practically determine which devices remain legal to sell.

Existing Devices

In addition to requiring new units to be cleaner, NESCAUM supports EPA's efforts to encourage the rapid replacement of older devices with new cleaner and more efficient models that meet EPA's proposed standards. Exempt units, along with the use of old units and improper operation of existing units, all contribute to ambient PM levels. Many manufactures still supply parts for pre-NSPS stoves and retailers can refurbish pre-NSPS stoves and legally sell these units. EPA should utilize the reconstruction provisions under the NSPS to require that all refurbished devices be tested to meet current applicable emission standards. EPA should also prohibit the sale of replacement parts that would exceed the reconstruction threshold.

Regulatory Limitations

We recognize that Congress did not give EPA the authority to regulate existing sources for particulate matter under Clean Air Act § 111, which is the basis of this proposed rulemaking. Under § 111(d), which gives EPA authority to regulate existing sources, Congress precluded EPA from regulating criteria air pollutants, and particulate matter is a criteria pollutant. We note that because EPA did not include residential wood heating devices as source categories under § 112 (hazardous air pollutants, or "HAPs"), it has the authority to regulate HAPs from existing wood burning devices under § 111(d). In order to do so, however, the existing source would have to be subject to a standard of performance for the regulated pollutant if it were a new source.

¹⁸ Presentation provided by EPA to NESCAUM on March 28, 2014 conference call.

Given that this source category accounts for 44% of all total stationary and mobile POM pollution and 62% of the 7-polycyclic aromatic hydrocarbons (PAH), we urge EPA to explore the establishment HAP emission limits in the NSPS under § 111(b) for a new sources and under § 111(d) for existing sources. Regulations for existing sources could address resale of uncertified devices and sale of replacement parts for uncertified devices.

Change-out Programs

NESCAUM supports EPA's efforts to encourage the more rapid replacement of older devices with newer more efficient models via change-out programs, and recognizes the air quality benefits that can be achieved by these efforts. These programs should focus on where they will have the greatest efficacy, such as areas in or close to non-attainment, low income households, or devices causing severe local impacts. Significant resources, however, will be required to address the existing inventory of high emitting devices. Given that EPA has no funding at this time for change-out programs, it will likely require Congressional action to fund change-out programs, and it would need to be funded at a high enough level to appreciably improve air quality. NESCAUM will support actions by EPA to obtain and provide funding for change-out programs. Further, we will work with EPA to determine how to best direct any available monies allocated for change-outs.

Test Methods

While EPA's proposed rule has a number of positive aspects, there are issues within the proposal that should be addressed. A significant public health issue from wood combustion is high-level, short-term particulate emission exposures. The current test method does not capture these spikes because it averages emissions over a full fuel charge. These can last from 2 to 40+ hours and include in the average what is referred to as the "charcoal tail" (a long period where the unit operates at very low emissions). As a result, the current test procedure does not adequately capture high emissions that can occur immediately after refueling a unit.

In addition, the use of oak as the test fuel for hydronic heaters can significantly underestimate emissions from other, less dense fuels. Testing data indicate that emission rates on a mass over time basis can be 200% to 400% greater for softwoods than those of hardwoods (e.g., oak).¹⁹ Therefore, we recommend that EPA support the development and use of an alternative test method that measures high emitting periods with use of real-world fuels, and standardize procedures to the greatest extent possible across all devices.

NESCAUM is also concerned about a variety of other issues related to the current test method, including compliance with EPA Stack Testing Policy²⁰ for NSPS sources, lab versus field performance, and test manipulation. The use of appropriate test methods that challenge a unit to perform its best under a variety of conditions is critical to ensuring clean burning units in field operations. While the current program uses a certification method in lieu of on-site stack

¹⁹ Allen, G. *Source Characterization of Outdoor Wood Furnaces*. Connecticut Department of Environmental Protection (September 2009). Available at <http://www.nescaum.org/documents/source-characterization-of-outdoor-wood-furnaces>.

²⁰ EPA. *Clean Air Act National Stack Testing Guidance*, (April 27, 2009). Available at: <http://www.epa.gov/compliance/resources/policies/monitoring/caa/stacktesting.pdf>.

testing to assure compliance, any test performed by a third party lab for certification purposes must conform to EPA's Stack Testing Policy. The policy states the following:

- The Clean Air Act requires that sources continuously comply with emission limits. This means that if the applicable emission standard is 1.3 grams per hour, the unit must never emit at a higher rate. If it does so, its compliance would be considered intermittent and therefore not in compliance with the NSPS standard.
- NSPS and NESHAP programs all require that performance tests be under representative operating conditions; EPA recommends that performance tests be performed under those conditions that:
 - Represent the range of combined process and control measure conditions under which the source expects to operate (regardless of the frequency of the conditions); and
 - Are likely to most challenge the emissions control measures of the source with regard to meeting the applicable emission standards, but without creating an unsafe condition.

The Guidance goes on to state:

- “For a facility operating under an emission rate standard (e.g., lb/hr) or concentration standard (e.g., $\mu\text{g}/\text{m}^3$), normal process operating conditions producing the highest emissions or loading to a control device would generally constitute the most challenging conditions with regard to the emissions standard.”
- “The test plan should generally include use of fuel, raw materials, and other process/control equipment that the facility expects to use during future operations that would present the greatest challenge in meeting applicable emissions standards.”

Based on EPA's Stack Testing Policy, EPA must ensure that this rule includes a test method that captures the highest emission rate under normal operating conditions, regardless of its frequency, and determines whether compliance with the emission standard is continuous. All changes to the applicable test method that reflect these basic tenets are supported by NESCAUM.

Burn Rate Testing and Testing Variability

Manufacturers and laboratories have argued that the test method has unmanageable variability.²¹ These claims do not align with a more rigorous statistical analysis of test results that eliminates outlier data. While the precision of Method 28 is not as high as desired, the current data do not allow for analysis to determine if the variability is due to technical capacity of lab personnel, fuel, or method. EPA should analyze the data based on similar burn rates, fuel moisture content, and fuel density. Additionally, EPA should ensure that comparison of test

²¹ Curkeet, R. and R. Ferguson. *EPA Wood Heater Test Method Variability Study*, (October 6, 2010).

results is an apples to apples comparison. Test results from certification testing should not be compared with tests used for research and verification testing or field testing that utilized different measurement techniques.

The use of weighted averages for an emission standard creates issues as well. The current rule requires testing in four burn categories with no replicate testing in any of those categories. EPA has addressed this issue in the proposal by moving from a four burn rate test to a high and low burn rate category test with replicate testing at the burn rate with the highest emission rate. NESCAUM supports the EPA move to require replicate tests to improve method precision and to assure that results are reproducible. If EPA determines that units must test at all four burn rates for efficiency testing, then NESCAUM strongly recommends that EPA require replicate testing in the category that achieves the highest emission rate to ensure that testing is representative rather than an outlier result.

Lab Facilities

NESCAUM does not support the use of manufacturer labs for certification testing. NESCAUM recommends that EPA only accept test results conducted at accredited third party labs. NESCAUM also urges EPA to adopt procedures to assure that the manufacturer plays no role in conducting or overseeing certification testing. Finally, in order to assure the ability to conduct compliance assurance activities and enforcement, all tests must be conducted in the United States. NESCAUM believes that EPA lacks authority to take enforcement actions against foreign labs that conduct NSPS tests.

EPA must continue to require the 30 day notice provisions in the rule in order that state and federal agencies are provided with adequate notification of testing to allow for witnessing of those tests. Additionally, EPA should request and pursue the collaboration of states to assist in the random observation and evaluation of test labs during certification testing.

Short term filter pulls

The current test method averages emissions over an entire burn cycle, which does not separately characterize emissions in start-up, steady state, and shutdown conditions. For example, this procedure does not capture the high emission rates that occur in the first hours when a unit is refueled.²² Additionally, when a single filter is used over a long test period, such as hydronic heater tests, particulate sample may be lost. For these reasons, NESCAUM supports EPA's proposal to measure short term PM emissions. NESCAUM recommends that EPA require filter samples be taken every 60 minutes for the first two hours for room heaters and three hours for central heating devices. These measurements must be reported independently for all devices tested.

Fuel Charge

Current test methods determine the amount of fuel used in a test by calculating the usable combustion chamber volume in cubic feet and multiplying by 7 pounds of wood for cordwood stoves and 10 pounds for cordwood central heating devices. While this loading has long been

²² Gullett, B. et al. *Environmental, Energy Market, and Health Characterization of Wood-Fired Hydronic Heater Technologies*, NYSERDA Report 12-15 (June 2012). Available at <http://www.nyserda.ny.gov/-/media/Files/Publications/Research/Environmental/Wood-Fired-Hydronic-Heater-Tech.pdf>.

accepted, in many cases it does not lead to a full chamber and may underestimate emissions in field operations. Issues such as these could be addressed in the central heating category by requiring the use of full thermal storage for cordwood-fired devices. Northern European countries mandate the use of full thermal storage with all cordwood-fired boilers.

End of the Test

Under the current rule, unburned fuel may remain in the device even when the test has officially ended. A test witnessed by EPA and NESCAUM staff showed that at the end of a hydronic heater test, unburned wood still remained in the firebox even though the test had officially ended based on the scale weight returning to original weight before loading the test fuel charge. While such a test is valid under Method 28, it highlights an issue that the test method does not require the full fuel charge to be burned in order to be a valid test run. Based on this experience, we recommend that EPA include a requirement for visual confirmation of fuel charge consumption in the final rule. In order to be a valid test run, only coals and ashes must remain in the firebox of the appliance. If any material recognizable as wood remains in the device chamber upon completion of the burn, the test should not be considered valid.

Testing Errors

Discovery of procedural errors in fueling or other operations likely to affect the results of certification testing, or any reported values outside a plausible range, should trigger immediate invalidation of an EPA certification. For example, efficiency values over 80% should be carefully examined for credibility. NESCAUM also supports the development of procedures to submit and track substantiated claims of unit issues, such as consumer complaints related to false advertising or observation of high *in situ* emissions. These issues should be tracked by the manufacturer's model. Once a model receives more than 25 claims, EPA should conduct an investigation and/or require retesting.

Other Test Methods

The proposed rule should allow for the addition of new and potentially improved testing methods from a variety of entities, including ASTM, EN testing, and national lab methods, that may lie outside the current proposed rule. Acceptance of any alternative method must be evaluated on a device-by-device basis and the related emission standard must be correlated to the base emission standard. For example, the current test method uses a procedure that only measures emissions when placing fuel on a hot coal bed and ends the test with a hot coal bed. This is known as a hot to hot test. This method was developed based on the assumption that these devices operate throughout the heating season with a continuous fire. Periodically, the owner may remove ash and feed fresh wood on top of an active coal bed, but the heater does not cold start as part of its operation. Reports have indicated that cold start periods happen frequently.²³ Some test methods, such as the one developed by Brookhaven National Lab (cited in the EPA proposal), use a test protocol that includes measurement of emissions when no coal bed exists.

²³ Houck, J.E., L.Y. Pitzman, and P. Tiegs. *Emission Factors for New Certified Residential Wood Heaters*, presentation at 17th Annual International Emission Inventory Conference "Inventory Evolution - Portal to Improved Air Quality," Portland, OR (June 4, 2008). Available at: <http://www.epa.gov/ttnchie1/conference/ei17/session4/houck.pdf>.

This is known as a cold to hot test. The cold to hot tests are more rigorous tests as they measure start up emissions as well as steady state emissions.

EPA has requested comments on the use of EN303-5, the European test method for wood-fired central heaters. This is a simpler test but it has several drawbacks when compared to Method 28. First, it requires measurement of PM at the maximum burn rate. A second measurement is made at 50% load but this does not include particulate emissions. CO and hydrocarbons are required measurements at both load levels. Second, European PM measurements utilize a hot filter in the stack and not a dilution tunnel method. This leads to lower particulate emission values as condensed semi-volatile organics are not captured as particulates. States, such as Maine and Massachusetts, have attempted to utilize EN303-5 tests by recalculating emission results via a correction formula that addresses differences in fuel heating values and incorporates volatile organic compound measurements. NESCAUM supports acceptance of results from EN303-5 tests only for pellet units and cordwood boilers that mandate the use of full thermal storage so long as those tests have been conducted in the United States and emission values are recalculated based on a formula that incorporates a correction factor similar to the one currently used by state agencies.

Before accepting any new method, EPA should require robust comparability testing to ensure that a revised test does not represent backsliding or eliminate high emission periods. For example, the ASTM process has approved a test method that eliminates the low burn category. Numerous studies have shown that low burn rates are typically seen in the field and result in high emission rates.²⁴ It is vital that all residential wood heating devices be tested at their lowest burn setting and that they be manufactured to permanently prevent alteration of this low burn setting. In the case of central heating units, we support EPA efforts to encourage the use of full thermal storage systems. NESCAUM recommends that any unit tested with thermal storage must be sold with thermal storage.

Additionally, unlike the current NSPS, the proposed rule should provide a clear pathway to test and certify new technology and not create a barrier for innovative technology. NESCAUM recommends inserting language in Section 60.534 to clarify the process for obtaining test method alterations that facilitate the testing of very large, very small, hybrid, or other unique designs or designs utilizing new technology.

ASTM process

The ASTM Standards process is problematic for many states because of its proprietary ownership of test methods published under that process. For some states, it will be impossible for them to participate because the ASTM's intellectual property requirements maintain that information developed under this process becomes the property of ASTM. Some states are precluded from participating due to state requirements that all work conducted with public dollars stay in the public domain.

It may be possible for some states to participate in relevant ASTM processes on a representative and rotating basis. The selected state personnel can report to all interested states regarding ASTM provisions and collect feedback. If EPA plans to use ASTM test methods for regulatory purposes, it is imperative that there be sufficient representation and resources to

²⁴ *Ibid.*

support participation by state and federal agencies. EPA should solicit further input from states and serve to veto items or processes that could weaken the rigor of test methods. Few, if any, states have staff familiar with the testing of solid fuel burning devices.

EPA should seek a legal agreement with ASTM allowing the publication of documents that parallel the ASTM test method but that will reside in the public domain and reflect any changes enacted by EPA. This public document would allow states ready access to review the emissions data used to certify test results.

Efficiency Testing

NESCAUM supports the implementation of robust efficiency testing. EPA's proposal to use CSA B415, while a move in the right direction, must address several outstanding issues with B415 related to unspecified fuel moisture, fuel species, and cycling units. CSA B415 is based on cord wood that specifies the use of any wood species so long as it is in a given fuel density range but does not specify a moisture content range. For hydronic heaters, it also specifies different burn rate categories than in Method 28. The lowest burn rate is < 35%, considerably higher than in EPA Method 28 WHH. We also have concerns about the use of CSA B415 use with units whose operation's cycle. The method calls for determination of average stack gas conditions and fuel use over 10 minute averaging periods. With cycling units, this is long relative to "on" periods when cycling and the key parts of the operation are often missed. It may be reasonable to consider adapting this method but the data collection frequency would need to be modified. Further, some provision for averaging fuel burn rate based on longer time periods would need to be developed. In order to assure accurate and comparative efficiency values, EPA must create clear guidelines as to how the testing will be conducted. NESCAUM also recommends that efficiency and emissions testing be conducted simultaneously. If EPA requires testing be conducted at four additional burn rates for efficiency testing, then NESCAUM recommends that EPA require inclusion of this testing for emission purposes as well.

Single Burn Rate Stoves

NESCAUM is concerned that a single burn rate stove can be easily modified into a variable rate stove with the simple addition of a flue damper. This modification would allow such units to operate at much lower burn rates with higher emissions. NESCAUM recommends that EPA require all single burn rate stoves to have emission and efficiency testing conducted with a damper in the flue.

Transition to Cordwood Test

NESCAUM supports the move to a cordwood test. Given, however, the lack of data and correlation between cordwood tests and crib fuel tests, NESCAUM urges EPA to adopt a transition period to move to this new test procedure. As EPA analyzes other test methods, NESCAUM urges EPA to use Method 301 or a similar process that develops correction factors to ensure that different methods are correlated to the emission standard based on Method 28 tests. As an alternative to Method 301, EPA could exercise its Section 114 authority to fully inform the Step 2 standard. Manufacturers have claimed that a cordwood test will yield higher emission results but data show that results could move in either direction. Additionally, as the market moves to more advanced designs that incorporate the use of fans and sensors to modulate air flow, EPA will need to ensure that there are clear methodologies to test these devices.

Fuel

Currently, Method 28 specifies different fuel wood species for woodstoves and hydronic heaters. Douglas fir is the test fuel for wood burning stoves and red or white oak for hydronic heaters. Douglas fir is a medium-density wood and considered a softwood. Red or white oak is specified for hydronic heaters and is considered a hardwood. Douglas fir is a wood species with a large range of fuel densities, while red and white oak are among the densest woods available in the United States.

Formal and informal surveys of wood burning homeowners across the U.S. indicate about a 50-50 split between softwood and hardwood burners. However, one or the other usually dominates in local areas depending on the local woody flora. There are sufficient data now to show that different wood fuel species produce different qualities and quantities of emissions. Independent studies have shown that burning softwoods produces higher emissions than hardwoods.²⁵ As EPA moves from a crib-based test to a cordwood test, NESCAUM recommends that EPA adopt a single fuel for testing residential wood heating devices that specifies allowable species and densities. At a minimum, EPA should require reporting of fuel density in the test reports. These data must be made publically available.

Moisture Content

NESCAUM has concerns about the impact of moisture content test variability. Additionally, NESCAUM has concerns that proposed procedures are not robust enough to accurately measure moisture content, especially on oak fuel, given the difficulty in obtaining uniform moisture content throughout the fuel piece. Preliminary tests suggest that an increase of 4% moisture can increase emissions by 6% to 18%.²⁶ As regulatory emission limits become more stringent, the effect of fuel moisture content on the variability of measured emissions will become more critical. NESCAUM supports efforts to use robust methods that codify moisture sampling techniques to increase testing accuracy.

Certification Process

EPA should establish a more rigorous program to audit the performance of the labs that conduct certification testing and establish a fund to pay for independent review of laboratory results. EPA has proposed moving from direct EPA lab accreditation to an ISO accreditation lab testing and certification process followed by subsequent certification by EPA. NESCAUM has significant concerns about the use of the ISO process, specifically as they relate to public accessibility of emissions testing data, testing notification to regulatory authorities, and clear separation between research testing, conducting certification testing, and certifying results. Additionally, the proposed rule relies heavily on proper and consistent oversight by OECA. It is

²⁵ Allen, G. *Source Characterization of Outdoor Wood Furnaces*. Connecticut Department of Environmental Protection (September 2009). Available at <http://www.nescaum.org/documents/source-characterization-of-outdoor-wood-furnaces>; Sierra Research memo to Dr. James Conner, Fairbanks North Star Borough. *Preliminary Report on Omni Test Laboratories' Measurement of Space Heating Emissions*. (January 24, 2012). Available at <http://cleanairfairbanks.files.wordpress.com/2012/02/critique-of-omni-space-heating-study-012412-pm.pdf>.

²⁶ Preto, F. *Emissions from Residential Wood Combustion*. Presentation at IEA Task 32 Workshop, Paris, France (October 21, 2005). Available at: http://www.ieabcc.nl/workshops/task32_Paris_ssc/Preto.pdf.

imperative that OECA direct appropriate resources to provide adequate oversight and inspection of test results and labs.

Inappropriate Claims of Confidential Business Information

Of great importance to NESCAUM is easy access to emissions data and supporting information, which is imperative for informing states and the public on current and future regulatory efforts. In the process of reviewing this proposed rule, NESCAUM requested emissions data from OECA but was unable to obtain that data in time for these comments due to common industry practices that include submitting the entire test reports as confidential business information (CBI). This is in conflict with the EPA Office of General Counsel's determination in 2006 that emissions data for this source category is not CBI. A copy of this determination has been provided in Attachment D.

Electronic Reporting

NESCAUM feels strongly that all reports related to this rule should be submitted electronically. The timely construction and deployment of an appropriate Electronic Reporting Tool (ERT) as a vital component of this rule that will assure proper oversight of testing efforts by state and federal enforcement agencies. The public and state regulators should have full access to all non-CBI materials submitted through an ERT. If such a tool is delayed, OECA should already be planning for an alternate method to fulfill state requests for data in a timely manner

Pellet Fuel Standard

With increasing use of pellet fuels for residential home heating, the composition of those pellets and the potential impact from their use is increasing in importance. A recent study on pellet fuel composition has found that these products can contain significant levels of metals and other harmful contaminants, which can significantly increase health-damaging emissions and potentially damage high efficiency equipment.²⁷ Additionally, a recent presentation at an industry conference indicates that sub-standard pellets result in equipment malfunction issues due to the formation of materials that clog components, also known as slag, sinters, or clinkers.²⁸

EPA has proposed recognizing the Pellet Fuel Institute (PFI) voluntary industry-developed standards. NESCAUM disagrees and instead recommends that EPA adopt the EN Plus standards²⁹ that are already in use by many European nations. EN Plus is a program developed in Europe that institutes quality standards both on the pellet production process and the elemental composition of the pellet. In addition, the EN Plus standard requires that wood pellets utilize materials that ensure a low carbon footprint of the raw materials used in manufacturing the wood pellet. The EN Plus program fulfills the requirements of EN 14961-2

²⁷ Rector, L.R. et al. *Elemental Analysis of Wood Fuels*, NYSERDA Report 13-13 (June 2013). Available at http://www.nescaum.org/documents/nyserda-rept-13-13_elemental_analysis_of_wood_fuel-201306.pdf.

²⁸ Rice, R.W. *Pellet Ash Composition and its Potential Effects on Stove and Boiler Performance and the Environment*, presentation at Heat the Northeast Conference (April 2014). Available at <http://nebiomassheat.com/pdfs/2014/1.b1.rice.pdf>.

²⁹ Additional information on the EN Plus program can be obtained at <http://www.enplus-pellets.eu/downloads/enplus-handbook>.

provisions with additional quality control and sustainability criteria. The current PFI standards do not identify pellets that contain contaminated wood (such as pressure treated and painted wood) and lack the rigor of the European pellet standards. The EN Plus standards have a proven track record of protecting the consumer from sub-standard pellets and assuring proper equipment operation. If EPA instead chooses to move forward with the PFI standards, then it should require additional analysis for arsenic, copper, cadmium, lead, mercury, and chrome.

Conclusion

In conclusion, EPA should adopt rigorous and achievable emission limits for all sources affected by this proposal. EPA's final rule should encourage the development and sale of advanced technology wood burning devices in the near-term. It should also accommodate a smooth transition to cleaner burning units across categories by allowing manufacturers to continue to sell most current technology devices for a period of time while they design for the future. Promoting the early installation of the cleanest devices is imperative because once installed, the devices typically remain in use for many years. We look forward to working with EPA and other stakeholders to ensure an effective and equitable final rule.

Sincerely,



Arthur Marin
Executive Director

cc: NESCAUM directors

Attachments: A. ECOS resolution
B. Public Health Studies
C. Industry growth – HPBA presentation
D. EPA Office of General Counsel Determination (Sept. 14, 2006)

Attachment A



Resolution 12-3
Approved August 28, 2012
Colorado Springs, Colorado

As certified by
R. Steven Brown
Executive Director

REGARDING NEW SOURCE PERFORMANCE STANDARDS FOR RESIDENTIAL WOOD BURNING DEVICES

WHEREAS, wood is an important renewable domestic energy resource for home heating; and

WHEREAS, inadequately designed and/or poorly controlled residential wood burning devices can emit high levels of fine particulate and air toxic pollutants that may impact public health, affecting sensitive populations such as children, the elderly, and those with existing medical conditions; and

WHEREAS, inadequately designed and/or poorly controlled residential wood burning devices can cause or contribute to violations of federal air quality health standards for fine particulate causing a significant public health and economic burden on urban and rural nonattainment communities across the country; and

WHEREAS, the Clean Air Act requires the United States Environmental Protection Agency (U.S. EPA) to establish New Source Performance Standards (NSPS) based on best demonstrated emission control technology and to review and, if appropriate, update such standards every 8 years; and

WHEREAS, advances in technology have occurred since the NSPS for Residential Wood Burning Heaters was initially created in 1988, and these cleaner burning designs are available in global markets such as the United States and European markets today; and

WHEREAS, as demonstrated by the 1988 NSPS and more recently in Europe, the introduction of cleaner, more fuel-efficient designs of residential wood burning devices has stimulated sales of new wood burning devices and the use of wood as an energy resource; and

WHEREAS, advanced residential wood burning devices are highly efficient and can reduce energy costs for consumers; and

WHEREAS, stricter emission and design standards for residential wood burning devices would benefit urban and rural communities that may be struggling with the adverse public health and economic consequences of nonattainment.

NOW, THEREFORE, BE IT RESOLVED THAT THE ENVIRONMENTAL COUNCIL OF THE STATES (ECOS):

Recommends that U.S. EPA act immediately to update the NSPS establishing health protective emission limits for all Residential Wood and Biomass Burning Devices, including fireplaces, woodstoves, outdoor wood-fired boilers (also known as outdoor hydronic heaters), and both indoor and outdoor furnaces that reflect today's Best Demonstrated Technology taking into account the cost of achieving such reduction;

Recommends that U.S. EPA revise test methods as appropriate and necessary so that the emissions performance of cleaner residential wood and biomass-burning devices can be accurately quantified;

Supports closing loopholes and eliminating exemptions for pellet stoves and single-burn rate appliances;

Supports promoting efficiency improvements that will save consumers money on fuel; and

Supports working with U.S. EPA and the appliance and wood fuel manufacturers to maximize the opportunities to expand the use of wood and biomass as important domestic energy sources in a way that protects public health and saves consumers money.

Attachment B

The following list of references from peer-reviewed scientific literature are just a few examples of the growing body of evidence for sub-daily cardiovascular effects associated with fine particulate matter.

Bhaskaran K, Hajat S, Armstrong B, Haines A, Herrett E, Wilkinson P, Smeeth L. The effects of hourly differences in air pollution on the risk of myocardial infarction: case crossover analysis of the MINAP database. *BMJ*. 2011 Sep 20;343:d5531.

Brook RD, Shin HH, Bard RL, Burnett RT, Vette A, Croghan C, Thornburg J, Rodes C, Williams R. Exploration of the rapid effects of personal fine particulate matter exposure on arterial hemodynamics and vascular function during the same day. *Environ Health Perspect*. 2011 May;119(5):688-94.

Devlin RB, Ghio AJ, Kehrl H, Sanders G, Cascio W. Elderly humans exposed to concentrated air pollution particles have decreased heart rate variability. *Eur Respir J Suppl*. 2003 May;40:76s-80s.

Gold DR, Litonjua A, Schwartz J, Lovett E, Larson A, Nearing B, Allen G, Verrier M, Cherry R, Verrier R. Ambient pollution and heart rate variability. *Circulation*. 2000 Mar 21;101(11):1267-73.

He F, Shaffer ML, Rodriguez-Colon S, Bixler EO, Vgontzas AN, Williams RW, Wu R, Cascio WE, Liao D. Acute effects of fine particulate air pollution on ST segment height: a longitudinal study. *Environ Health*. 2010 Nov 8;9:68.

He F, Shaffer ML, Li X, Rodriguez-Colon S, Wolbrette DL, Williams R, Cascio WE, Liao D. Individual-level PM_{2.5} exposure and the time course of impaired heart rate variability: the APACR Study. *J Expo Sci Environ Epidemiol*. 2011 Jan-Feb;21(1):65-73.

He F, Shaffer ML, Rodriguez-Colon S, Yanosky JD, Bixler E, Cascio WE, Liao D. Acute effects of fine particulate air pollution on cardiac arrhythmia: the APACR study. *Environ Health Perspect*. 2011 Jul;119(7):927-32. doi: 10.1289/ehp.1002640. Epub 2011 Mar 11.

Liao D, Shaffer ML, Rodriguez-Colon S, He F, Li X, Wolbrette DL, Yanosky J, Cascio WE. Acute adverse effects of fine particulate air pollution on ventricular repolarization. *Environ Health Perspect.* 2010 Jul;118(7):1010-5.

Liao D, Shaffer ML, He F, Rodriguez-Colon S, Wu R, Whitsel EA, Bixler EO, Cascio WE. Fine particulate air pollution is associated with higher vulnerability to atrial fibrillation--the APACR study. *J Toxicol Environ Health A.* 2011;74(11):693-705.

Magari SR, Schwartz J, Williams PL, Hauser R, Smith TJ, Christiani DC. The association between personal measurements of environmental exposure to particulates and heart rate variability. *Epidemiology.* 2002 May;13(3):305-10.

Peters A, Dockery DW, Muller JE, Mittleman MA. Increased particulate air pollution and the triggering of myocardial infarction. *Circulation.* 2001 Jun 12;103(23):2810-5

Rappold AG, Stone SL, Cascio WE, Neas LM, Kilaru VJ, Carraway MS, Szykman JJ, Ising A, Cleve WE, Meridith JT, Vaughan-Batten H, Deyneka L, Devlin RB. Peat bog wildfire smoke exposure in rural North Carolina is associated with cardiopulmonary emergency department visits assessed through syndromic surveillance. *Environ. Health Perspect.* 2011 October: 119:1415-1420

Rosenthal FS, Carney JP, Olinger ML. Out-of-hospital cardiac arrest and airborne fine particulate matter: a case-crossover analysis of emergency medical services data in Indianapolis, Indiana. *Environ Health Perspect.* 2008 May;116(5):631-6.

Vallejo M, Ruiz S, Hermosillo AG, Borja-Aburto VH, Cárdenas M. Ambient fine particles modify heart rate variability in young healthy adults. *J Expo Sci Environ Epidemiol.* 2006 Mar;16(2):125-30.

Pellet Fuels Institute Membership Meeting

Breakfast
Thursday, March
6, 2014

Don Johnson, *HPBA*
Director of Market
Research



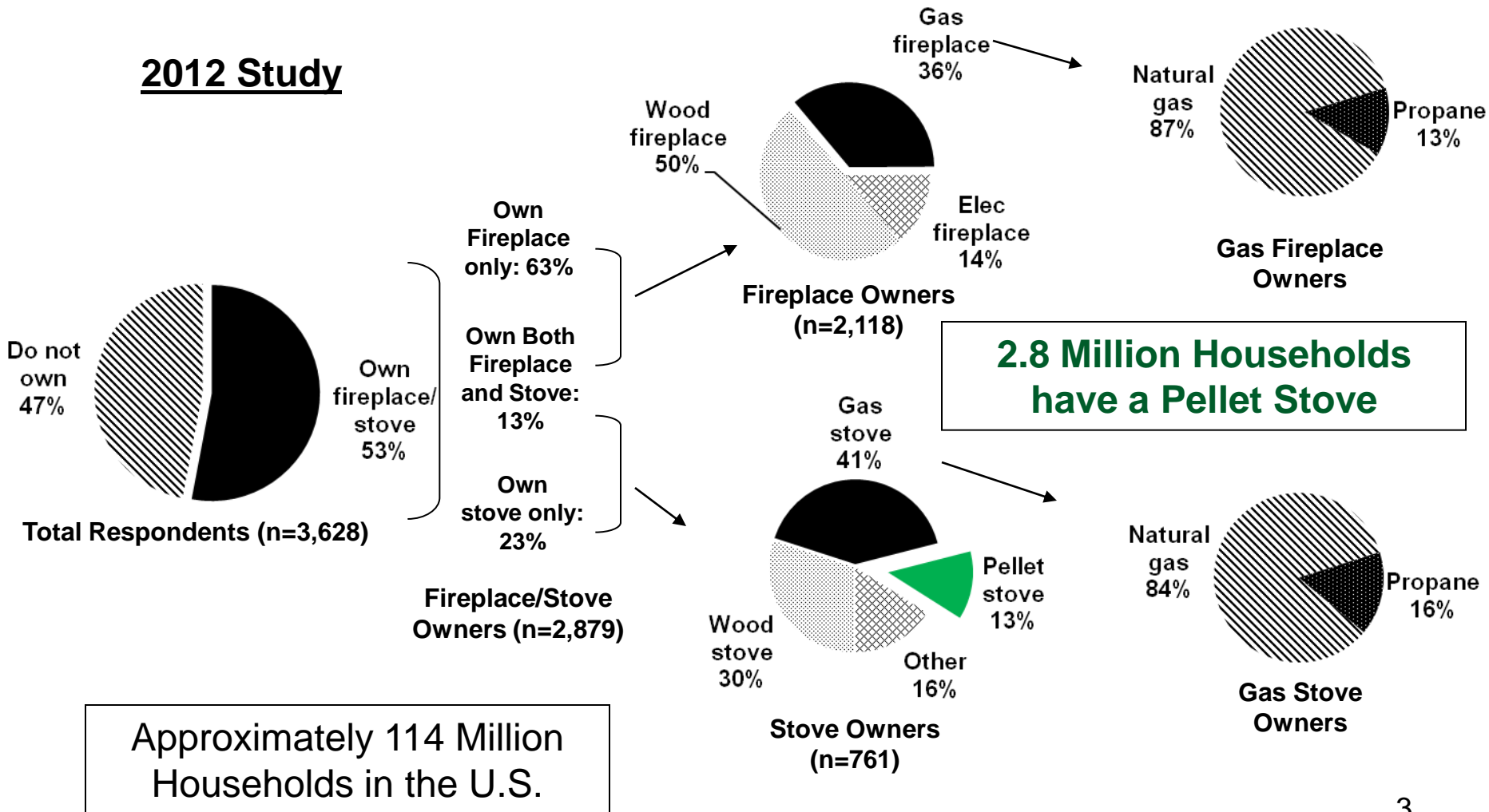
Agenda

- Hearth appliance shipment statistics
- Pellet appliance shipment statistics
- Biomass central heating shipment statistics



Own Fireplace/Stove in Primary Residence

2012 Study



“Top of the Line” Hearth Industry Shipment Statistics



“Top of the Line” Hearth Shipment Statistics

- Generated with HPBA’s *Quarterly Industry Survey*
- Data released at HPBExpo
- Posted on web site shortly after HPBExpo



U.S. Hearth Appliance Shipments in 2013



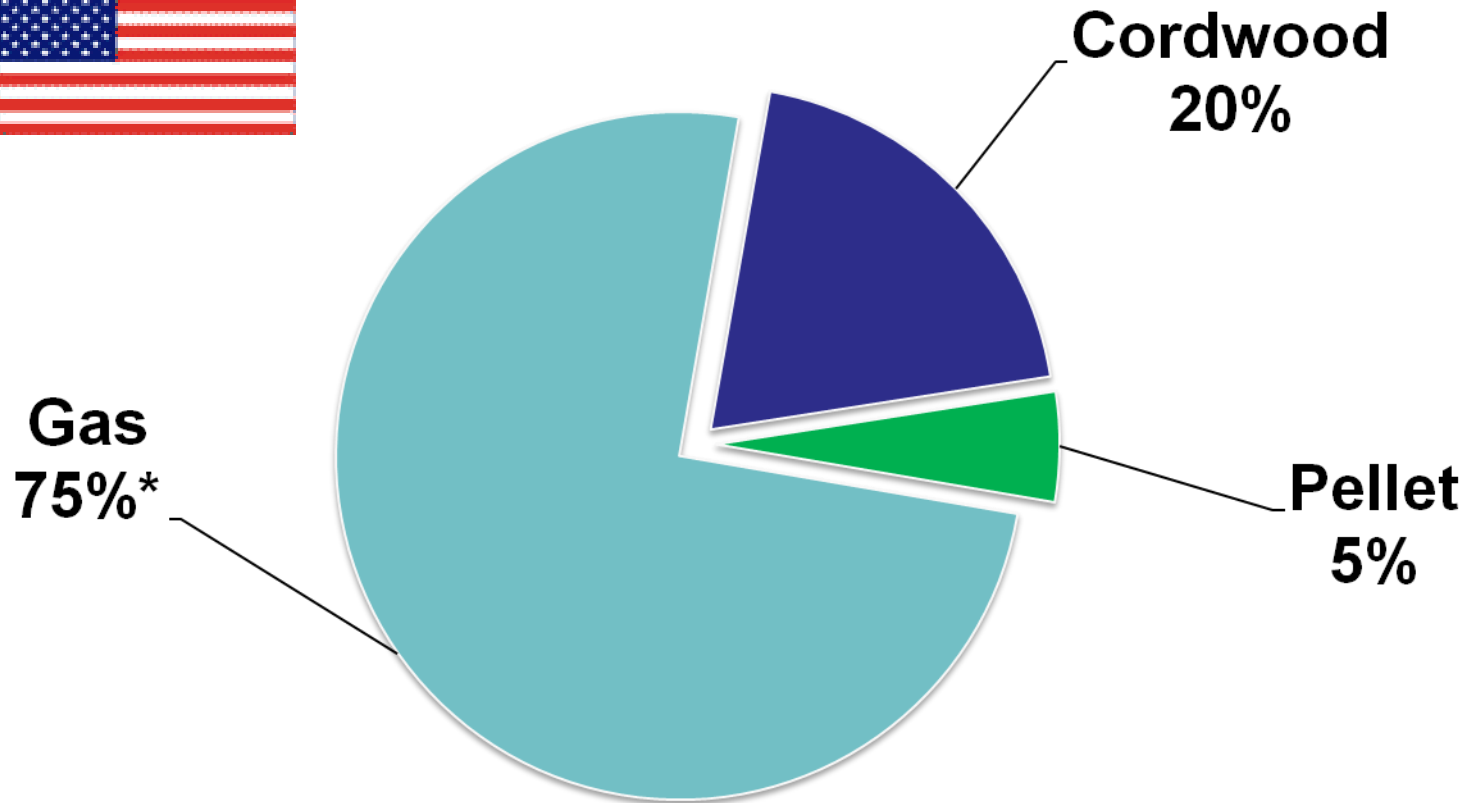
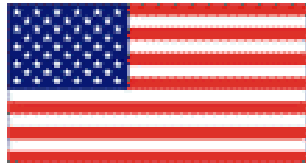
- Cordwood – 206,409
 - Gas – 784,633*
 - Pellet – 54,055
- **TOTAL – 1,045,097**

***Includes an Estimated 322,600 Gas Logs Shipped In North America**

Electric Hearth Appliance Shipments in North America – 1,600,000

Note: Gas Log and Electric Data Estimated Annually

U.S. Hearth Appliance Shipments by Type of Fuel -- 2013

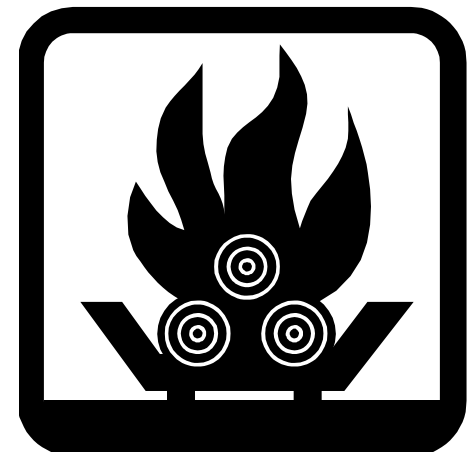


***Includes Gas Log Data**

U.S. Hearth Appliance Shipments Between 2012 and 2013 . . .

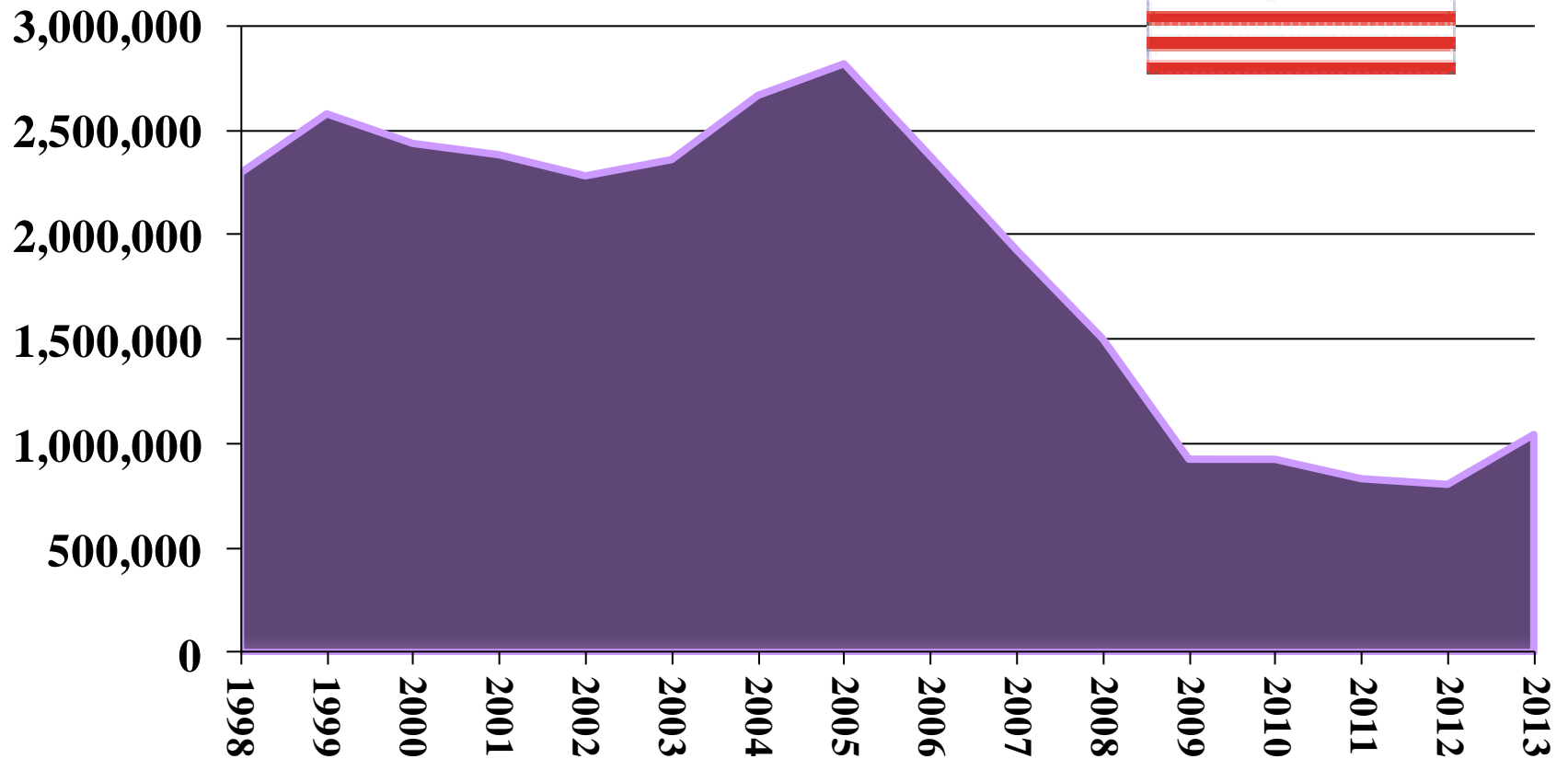
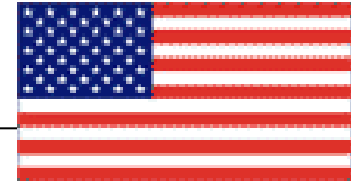
- **Cordwood** appliance shipments **increased 15%**
 - From 180,066 to 206,409
- **Gas** appliance shipments **increased 36%**
 - From 577,942 to 784,633
- **Pellet** appliance shipments **increased 12%**
 - From 48,277 to 54,055
- **Electric** appliance shipments **increased 7%**
 - From 1,500,000 to 1,600,000

Overall, industry
increased 30%
between 2012 and
2013 (excluding
Electric Appliances)



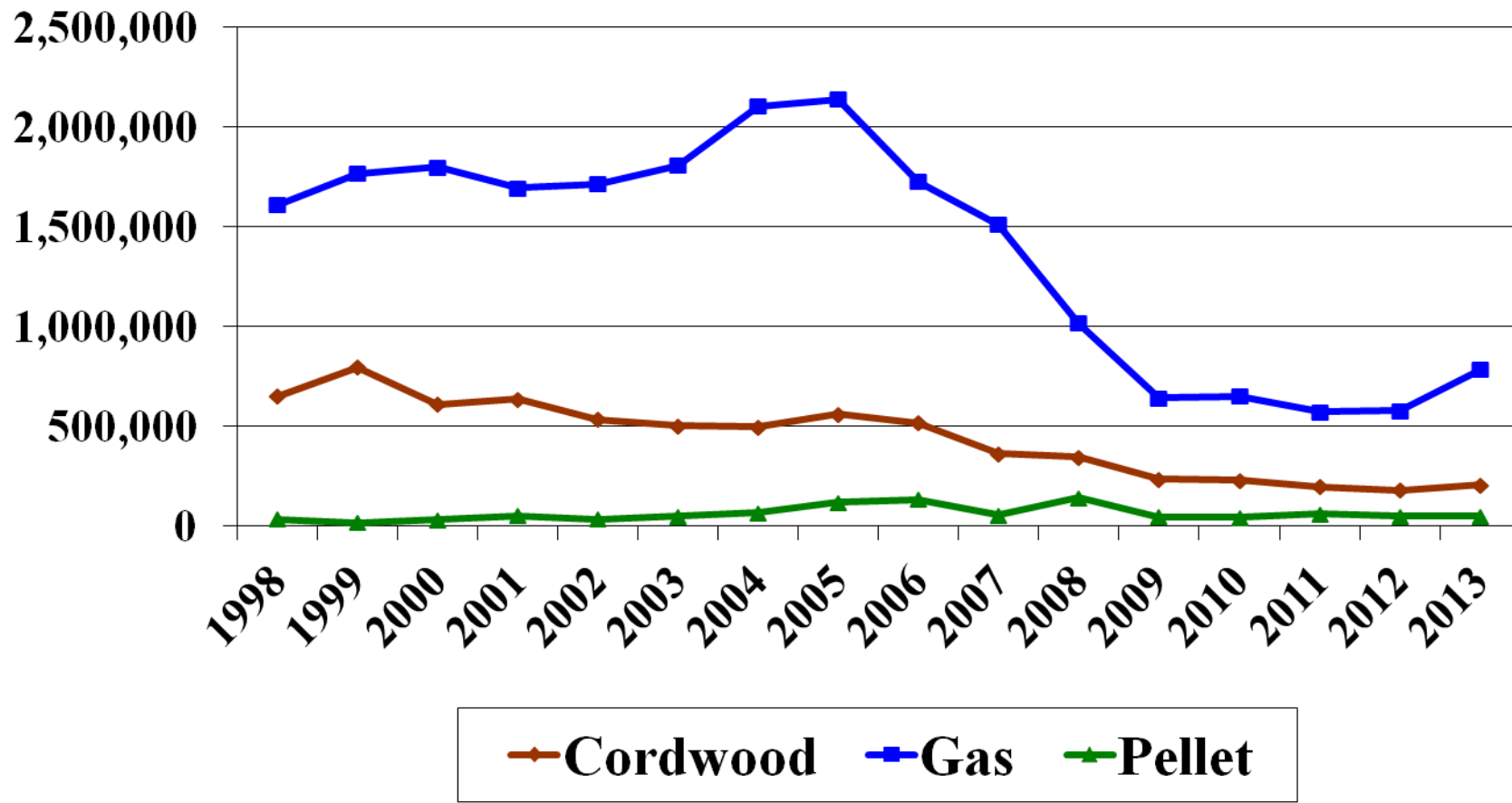
Total U.S. Hearth Appliance Shipments

1998--2013



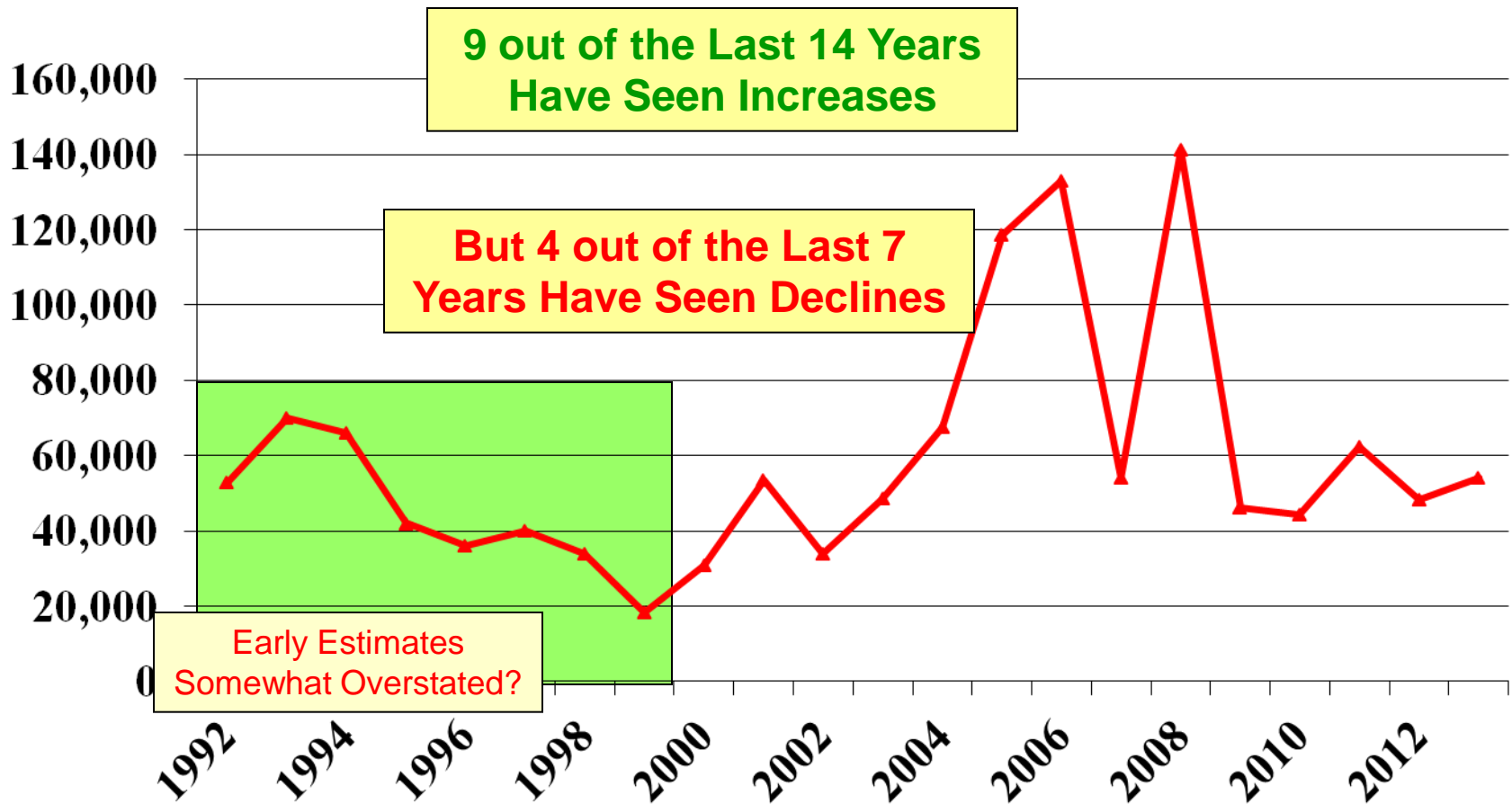
U.S. Hearth Appliance Shipments

1998--2013

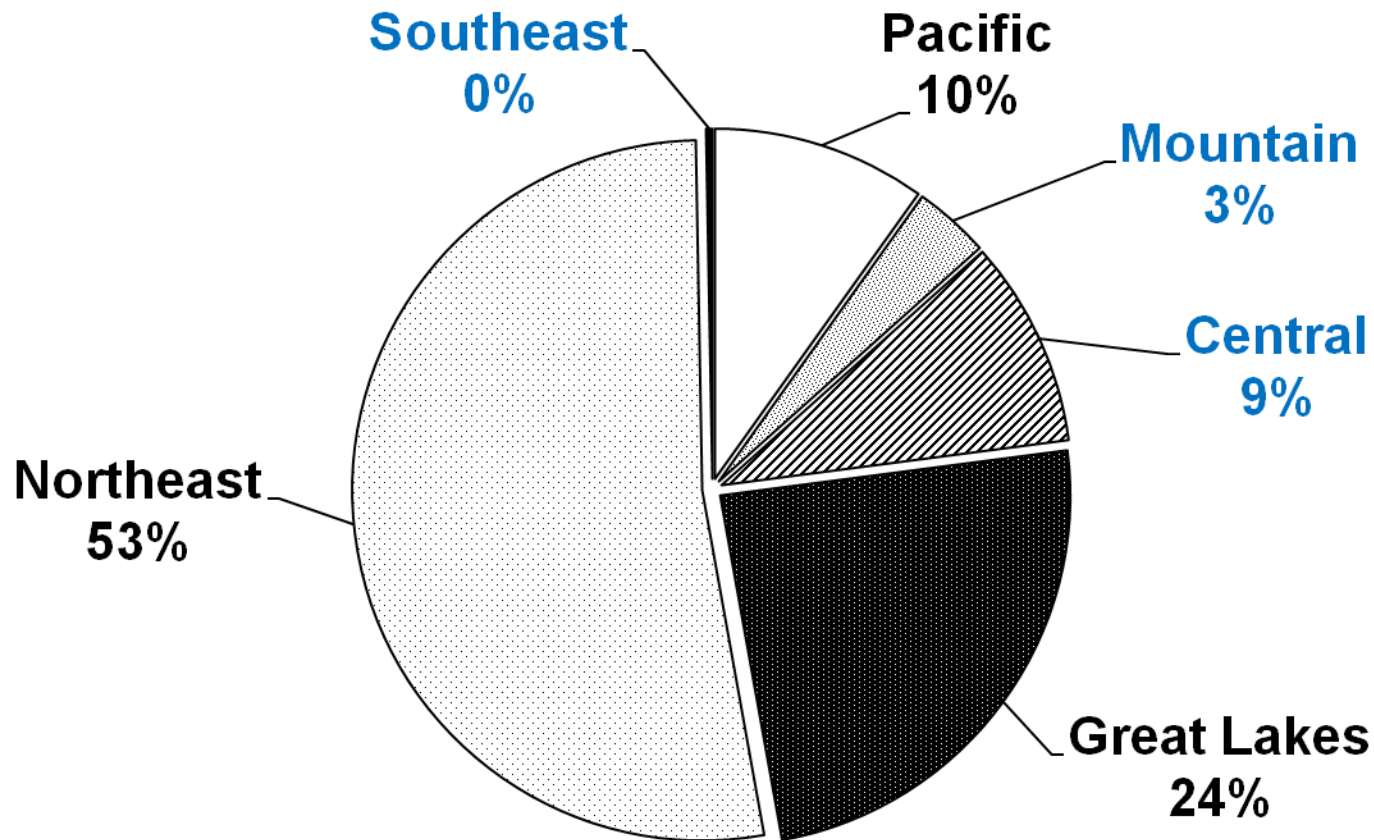


U.S. Pellet Appliance Shipments

1992--2013

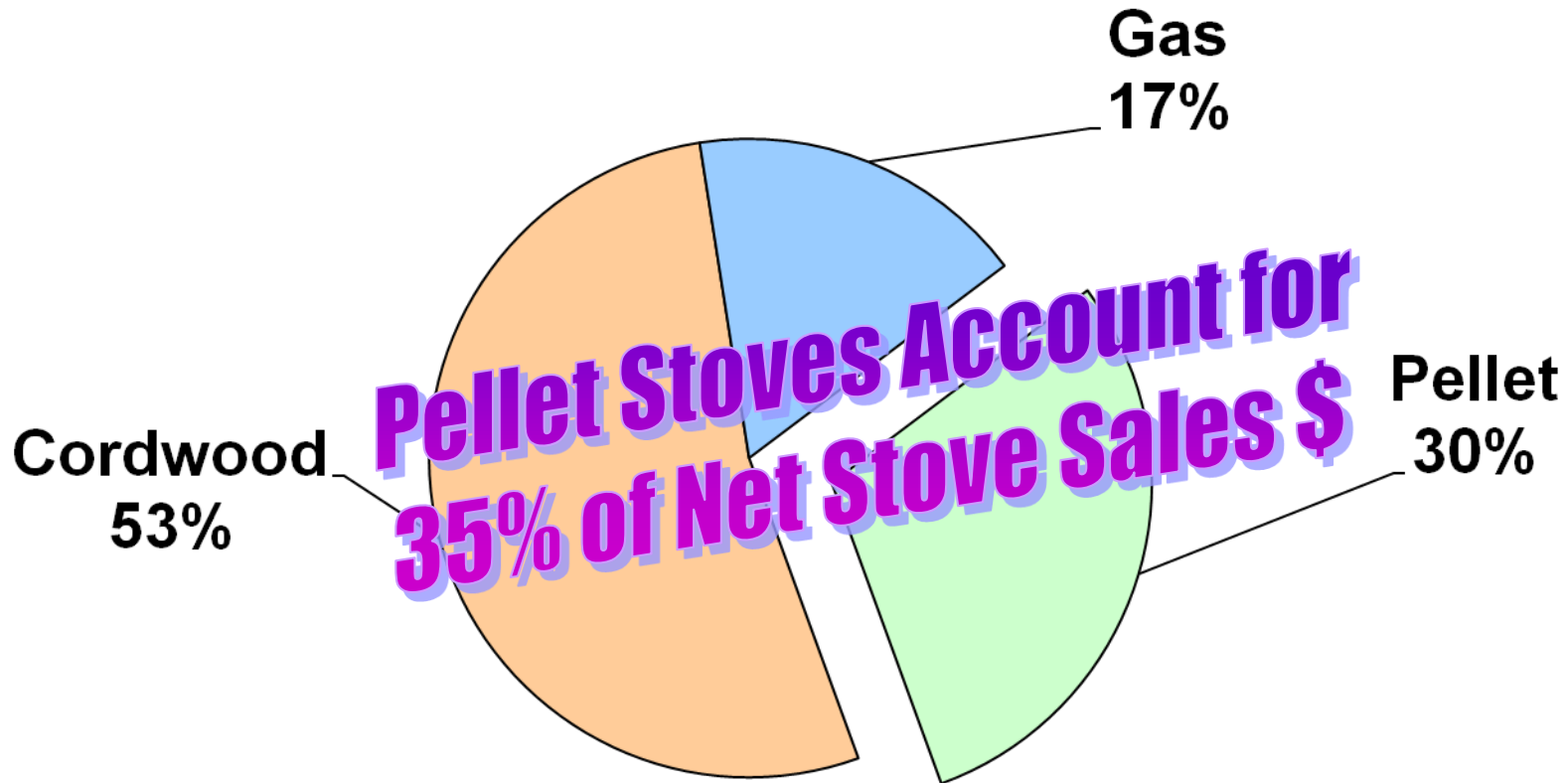


U.S. Pellet Appliance Shipments 2013



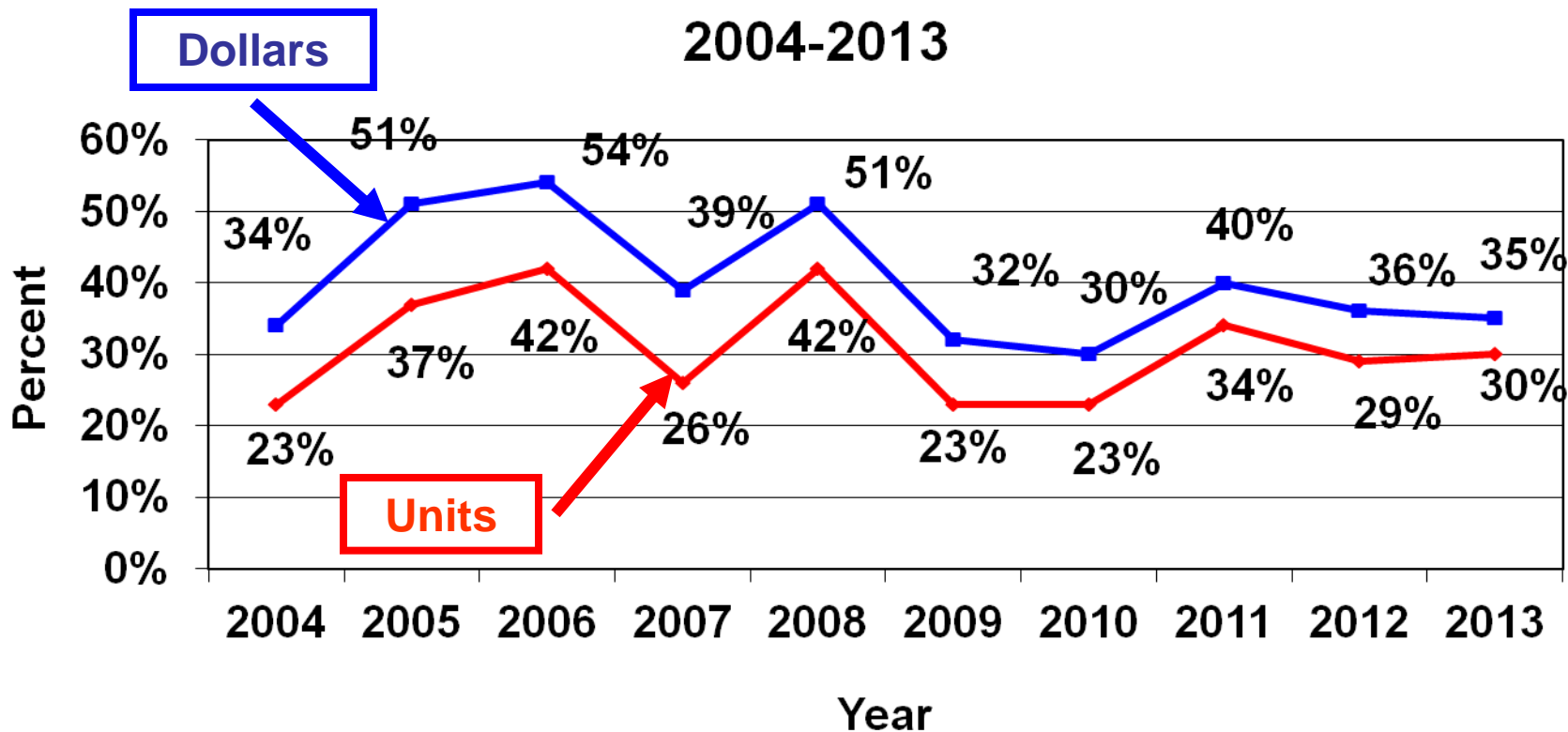
U.S. Freestanding Stove

Appliance Shipments by Type of Fuel -- 2013



Pellet Stoves vs. Freestanding Stoves

Percent of Pellet Stoves vs. Freestanding Stoves
2004-2013

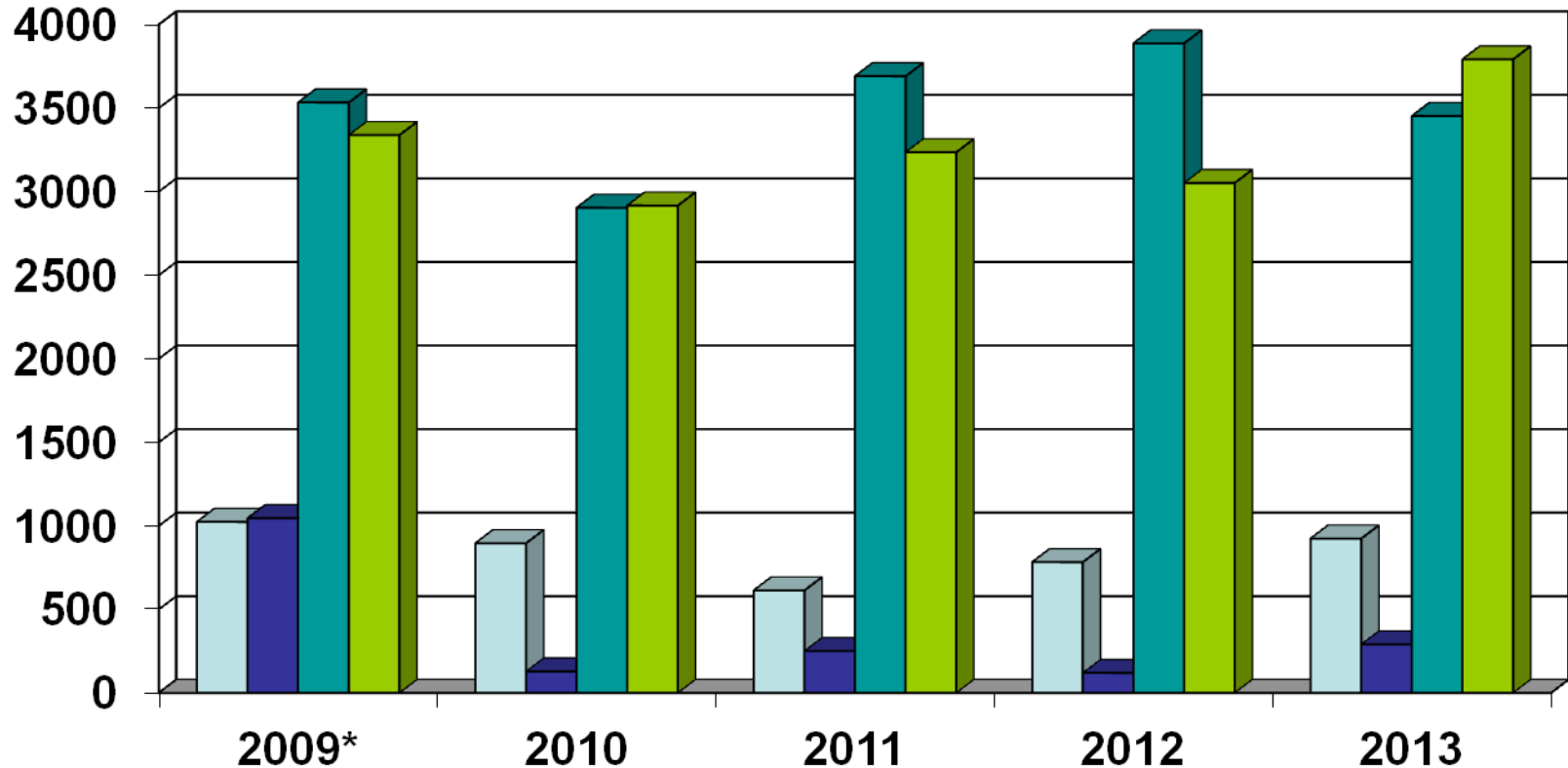


Central Heating Systems Fueled with Biomass Fuels

- Program started 2Q09
- Two categories collected:
 - Central Heating Systems fueled with Pellets
 - Central Heating Systems fueled with Cordwood/Wood Chips



Central Biomass Heating Units Shipped Since April 2009



■ Pellet (US) ■ Pellet (Canada) ■ Wood Chip (US) ■ Wood Chip (Canada)

*April 2009 through December 2009

Pellet Appliance Observations

- Pellet Appliance Shipments and Sales are the most **volatile** in the hearth industry
- When the consumers view the price of **heating their home to be expensive**, then **sales and shipments dramatically increase**
- When the consumers view the price of **heating their home to be reasonable**, then **sales and shipments are much less robust**





Questions?

Attachment D



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 14 2006

OFFICE OF
GENERAL COUNSEL

AIR QUALITY

OCT - 3 2006

RECEIVED

Mr. Richard A. Valentinetti, Director
Vermont Department of Environmental Conservation
Air Pollution Control Division
103 South Main Street, Building 3, South
Waterbury, VT 05671-0402

Re: Freedom of Information Act Appeal 01-RIN-00075-05-A

Dear Mr. Valentinetti:

This letter responds to your July 1, 2005 appeal pursuant to the Freedom of Information Act ("FOIA"), 5 U.S.C. § 552. You appealed the June 9, 2005, decision of Stephen S. Perkins, Director, Office of Environmental Stewardship, Region 1 of the U. S. Environmental Protection Agency ("EPA" or "Agency") to partially deny your January 6, 2005 request regarding various manufacturers of outdoor wood-fired boilers ("OWB"). Mr. Perkins' decision indicated that your request was denied in part because the documents were exempt from disclosure under Exemption 4 of the FOIA, 5 U.S.C. § 552 (b)(4) of the FOIA.

I have carefully considered your request, EPA's decision, and your appeal. For the reasons set forth below, I have determined that your appeal should be, and is, granted.

Your request sought information EPA obtained from manufacturers of OWB pursuant to Section 114 of the Clean Air Act ("section 114 request"). Several of the manufacturers claimed part or all of their responses to the Section 114 requests as confidential business information. EPA sent you a partial denial by letter dated June 9, 2005, releasing some of the information and informing you that EPA was initially withholding information claimed as confidential business information pending issuance of a final confidentiality determination. In your appeal, you state that you are continuing to seek:

(a) Name and address of each business or commercial entity located in the United States that has purchased an OWB from the manufacturer since January 1, 1995, as well as the calendar year the sale transpired and the model number of the sold model; and

(b) Copies of any air pollution test data on OWBs that the manufacturers possess, including specification of the test methods used.

Mr. Richard Valentinetti
FOIA Appeal No 01-RIN-00075-05-A
Page 2

By letter dated July 21, 2005, Mr. Perkins provided to you summary sales data for all 50 states. In that letter Mr. Perkins reaffirmed your agreement with EPA Region 1 to narrow your request to include aggregate sales data, as opposed to specific sales data from any one manufacturer. Therefore, I have confirmed that EPA Region1 has provided to you all summary sales data responsive to your request.

Your appeal takes issue with the Agency's decision to withhold air pollution test data the businesses claimed as confidential business information, 5 U.S.C. § 552(b)(4). I have determined that this information is publicly available and may be released. I am providing the released documents as enclosures to this letter. (See the enclosed List of Releasable Documents)

This letter constitutes EPA's final determination on your appeal. In accordance with 5 U.S.C. § 552(a)(4)(B), you have the right to seek judicial review of this determination by instituting an action in the district court of the United States in the district in which you reside, or have your principal place of business, or in which the Agency records are situated, or in the District of Columbia.

Sincerely,



Byron R. Brown
Assistant General Counsel
General Law Office

Enclosures

cc: Stephen S. Perkins, R1 Office of Environmental Stewardship
Tom Olivier, R1 Office of Environmental Stewardship
Elizabeth Kudaruskas, R1 Environmental Engineer
Alice Kaufman, R1 FOIA Coordinator
Cris Schena, R1 FOIA Coordinator

List of Released Documents
FOIA Appeal No. 01-RIN-00075-05-A

Central Boiler, Inc., Laboratory, 20502 160th Street., Greenbush, MN 56726

1. Test Report Est of Wood Burning Furnace for Emissions and Efficiency Based on EPA Methods 28 and 5g-3, by Central Boiler, Inc., Laboratory, dated April 16, 2003.
2. Results of Wood-Fired Boiler Flue-Gas Temperature Measurements Conducted on December 15, 1998.
3. Results of Wood-Fired Boiler Flue-Gas Temperature Measurements Conducted on December 16, 1998 and December 17, 1998.
4. Results of Wood-Fired Boiler Flue-Gas Temperature Measurements Conducted on December 17, 1998 and December 18, 1998.
5. Results of Wood-Fired Boiler Flue-Gas Temperature Measurements Conducted on December 18, 1998.
6. Test Report: Measurements of Atmospheric and Indoor Particulate Pollution Generated by a U.S. EPA-Certified Wood-Burning Stove, by OMNI-Test Laboratories, Inc., dated October 25, 2001.

Hardy Manufacturing Co., Inc., 12345 Route 505, Philadelphia, MS 39350

1. Test Report: Intertek Testing Services Report # 3053311 – Test of a Wood Burning Outdoor Boiler for Efficiency and Emissions Per Intertek’s Proposed Protocol for Outdoor Boiler Efficiency and Emissions Research Testing Model: H2 for Hardy Manufacturing Co., Inc.