

# Residential Wood Heaters

New Source Performance Standards (NSPS)  
Current Draft Revisions

Tribal Consultation Call  
March 22, 2011  
Point of Contact: Gil Wood

# EPA Points of Contact

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# Background

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- Current rule requires manufacturers to design new residential wood heaters to meet particulate emission (PM) limits, have representative heaters (per model line) tested by EPA-accredited lab, and attach EPA label after EPA approval
- Current rule requires operation according to owner's manual
- Originally promulgated February 1988
- Not substantively reviewed until now

# Perspective: Wood Smoke PM<sub>2.5</sub> Emissions Are Significant

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- 2008 National Emission Inventory: 2,449,000 tons
- 2008 Residential Wood Combustion: (~13%) 318,000 tons

# Perspective: Wood Smoke Can Cause Significant Health Effects

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- Residential wood smoke can increase particle pollution to levels that cause significant health concerns (e.g., asthma attacks, heart attacks, premature death).
- Several areas with wood smoke problems either exceed EPA's health-based standards for fine particles or are on the cusp of exceeding those standards.
- For example, residential wood smoke contributes 25 percent of the wintertime pollution problem in Keene, New Hampshire.
- In Sacramento, California, and Tacoma, Washington, wood smoke makes up over 50 percent of the wintertime particle pollution problem.

# Many State, Local, and Tribal Officials Want Updated, Stringent, and Revised NSPS

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- Wood smoke programs are very important in numerous areas
- Programs include wood-burning bans and change-outs
- Numerous letters and meetings requesting NSPS revisions

# Many Requests for NSPS for Hydronic Heaters, aka Outdoor Wood Boilers

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- Petition from 6 northeastern states plus Michigan and NESCAUM (Northeast States Consortium for Air Use Management)
- Request from the Hearth, Patio, and Barbecue Association (HPBA) Outdoor Wood-fired Hydronic Heater (OWHH) Caucus
  - Their concerns were “black eye” on industry and proliferation of local bans and state rules with differing requirements
- Huge number of calls and emails from neighbors and others concerned about health effects and nuisance impacts

# Key Dates

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- Proposal of NSPS – June 2011
- Final NSPS – July 2012

# Overview of Key Draft\* Proposals

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- Strengthen emission limits to reflect today's Best Demonstrated Technology (BDT), considering costs...
- Close “loopholes”
- Include pellet stoves and single-burn rate appliances explicitly
- Include wood “boilers” (hydronic heaters) and furnaces
- Revise test methods as appropriate

\* All options are draft and are subject to change pending EPA Administrator’s review and signature on rulemaking proposal in Federal Register for public comment

# Potential PM<sub>2.5</sub> Emissions from New Units Sold (tons/year in 5<sup>th</sup> year, 2017)

Appliance	Baseline (Current NSPS)	Draft NSPS Revisions
EPA Certified Wood Stoves	700	700
Single-Burn-Rate Stoves	1140	330
Pellet Stoves	240	240
Indoor Forced-Air Furnaces	3700	370
Hydronic Heaters (90% outdoor, 10% indoor)	1600	80

# Draft Analysis of Health Benefits in 2017

## Total Monetized Benefits in 2017 (billions of 2008\$)

3% discount rate	7% discount rate
\$2.2 to \$5.3	\$2.0 to \$4.8

## Reductions in Health Incidences in 2017

	Draft NSPS
<b>Avoided Premature Mortality</b>	
Pope et al.	240
Laden et al.	620
<b>Avoided Morbidity</b>	
Chronic Bronchitis	180
Acute Myocardial Infarction	400
Hospital Admissions, Resp	57
Hospital Admissions, Cardio	120
Emergency Room Visits, Resp	180
Acute Bronchitis	410
Work Loss Days	35,000
Asthma Exacerbation	4,500
Minor Restricted Activity Day	200,000
Lower Respiratory Symptoms	4,900
Upper Respiratory Symptoms	3,700

# Compliance & Enforcement Aspects

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- Improve compliance assurance --- more inspections of labs and manufacturers, random audits
- Make consumer-friendly --- Burn Wise website [www.epa.gov/burnwise](http://www.epa.gov/burnwise), proper burn practices, certifications ranked by emissions and efficiency
- Require emission tests on each certified type of fuel that manufacturer specifies/warrants for use

# Wood Stove Draft Options (for stoves affected by 1988 NSPS)

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- 1988 NSPS:
  - 7.5 g/hr for non-catalytic
  - 4.1 g/hr for catalytic
- Draft NSPS 2013 Limit for PM: Match Washington State Limits
  - 4.5 g/hr for non-catalytic
  - 2.5 g/hr for catalytic
- We considered but do not intend to propose a tighter NSPS 2015 Level that does not subcategorize catalytic stoves
  - 2.5 g/hr for either
  - Cost-effectiveness was of concern
- Will include visible emission limits and require efficiency test
- Will ask for input on how to ensure proper operation at low burn rates

# Pellet Stove Draft Options

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- 1988 NSPS:
  - 7.5 g/hr for non-catalytic
  - 4.1 g/hr for catalytic
  - However, most pellet stoves are exempt via the 35:1 air-to-fuel ratio exemption
  
- Draft NSPS 2013 Limit for PM: Match Wood Stove NSPS Revisions
  
- We considered but do not intend to propose a tighter 2015 level
  - 1/3 of pellet stoves meet 1.0 g/hr, but cost-effectiveness is questionable
  
- We will include visible emission limits and require efficiency tests

# Single-Burn-Rate Stove Draft Options

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- Exempt from 1988 NSPS
- Estimate >40,000 units sold per year
- Draft NSPS 2014 Limits Equivalent to WA Wood Stove Limits Adjusted for Easier Burn Rate
  - 3.0 g/hr?
- We will request data to potentially support tighter limits
- “Camp stoves” must be labeled for portable, temporary use only
- We will include visible emission limits and require efficiency tests

# Hydronic Heater (HH) Draft Options

- Aka “Outdoor wood boilers”
- Exempt from 1988 NSPS
- Typical emissions: >4 lb /mmBTU heat output
- Draft NSPS limits for PM
  - 0.32 lb / mmBTU heat output for outdoor HH in 2013 and indoor in 2014
  - 0.15 lb / mmBTU heat output for both outdoor and indoor HH in 2016
- Draft NSPS limits for CO
  - 1000 mg / m<sup>3</sup> at 12% O<sub>2</sub> in 2013/2014
  - 650 mg / m<sup>3</sup> at 12% O<sub>2</sub> in 2016
- Draft NSPS limit for Visible Emissions
  - 6 minutes per hour in field

# Forced-Air / Warm-Air Furnace Draft Options

- Exempt from 1988 NSPS
- Canadian B415.1-10 level
  - 0.93 lb / mmBTU heat output
- Draft NSPS limit for PM
  - 0.93 lb / mmBTU heat output in 2014
  - Ask for comments on whether limit should be same as for hydronic heaters to avoid competitive imbalance
- Draft NSPS limit for CO
  - 1000 mg / m<sup>3</sup> at 12% O<sub>2</sub>
- Draft NSPS limit for Visible Emissions
  - 6 minutes per hour in field

# Cook Stove Options

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- Exempt from 1988 NSPS
- Appreciate input from Tribes
- **Recommend NSPS: Tighter definition and labels**
  - Design requirements for “North American traditional cook stove”
    - Estimates of <1000 units per year
    - Not the big loophole that some theorized

# Ceremonial Fires

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- Emphasize that ceremonial fires are not covered by the NSPS

# Any other issues/suggestions?

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- We appreciate your input...

# Appendix

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- A few pictures to illustrate...

# Photos of OWB Emissions



Photos courtesy of Vermont DEC

# A Common Wood-fired Hydronic Heater



# How Outdoor Wood Boilers Work

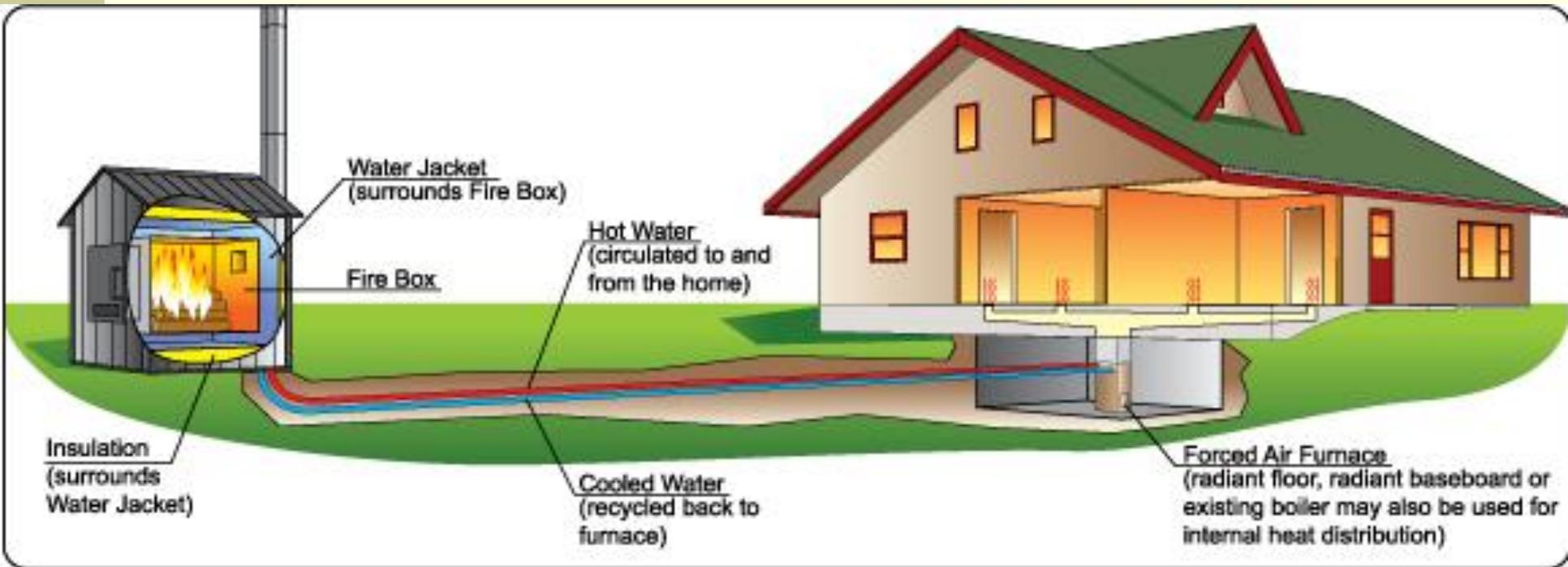
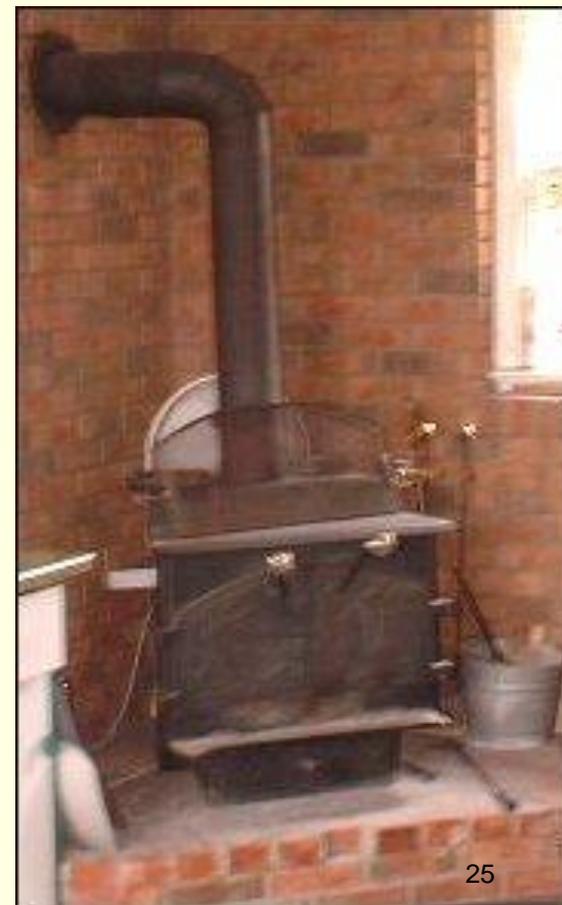
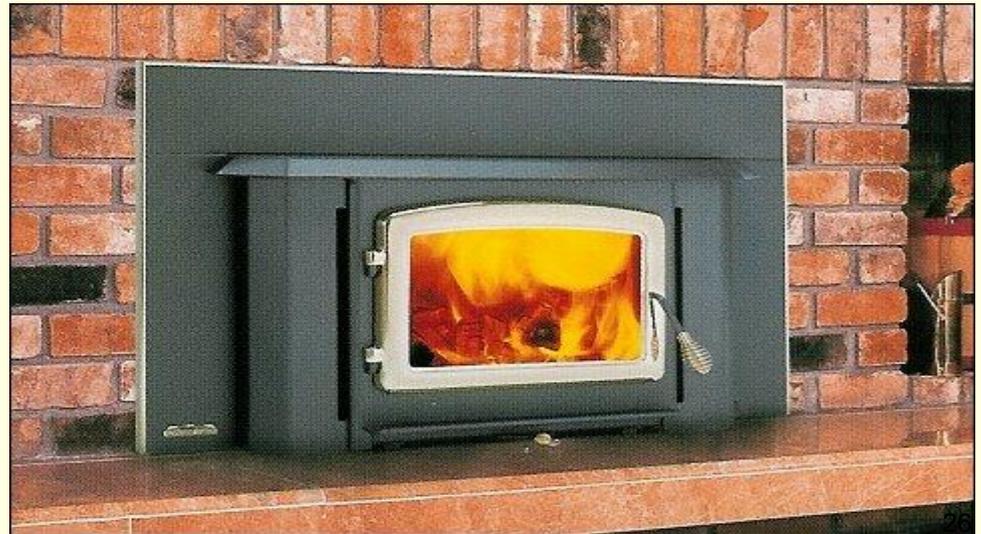


Diagram Courtesy of HPBA

# Old “Conventional” Wood Stoves Built before 1990 (pre-NSPS compliance date)



# EPA-Certified Woodstoves (after 1990) (a “free-standing” stove and an “insert”)



# Wood Pellet Stove

