



# EPA's Residential Hydronic Heater Program

Heating the Northeast  
Manchester, NH  
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# Outline

- The Residential Wood Combustion (RWC) issue
- PM<sub>2.5</sub> Emissions
- Voluntary Hydronic Heater (HH) Program
- New England State Regulations
- Status of NSPS for Wood Heaters
- Burn Wise Resources

## Why is RWC an Issue?

- Nationally, accounts for 44 % of total stationary and mobile polycyclic organic matter (POM) emissions
- Nationally, accounts for 62 % of the 7 polycyclic aromatic hydrocarbons (PAH) that are probable human carcinogens
- GHG Emissions: methane, black carbon, CO<sub>2</sub>
- Low stacks, poor dispersion (esp in valleys)
- Largest source of ambient PM<sub>2.5</sub> in some areas of New England during Winter



## RWC and Health Effects

- In some communities, wood smoke emissions linked with increase in asthma attacks, heart attacks, and premature death
- Some areas exceed or near exceeding EPA's health-based PM standards. E.g., residential wood smoke is:
  - ~ 25% wintertime pollution in Keene, NH
  - > 50% wintertime pollution in Sacramento, CA, and Tacoma, WA



## Wood Smoke PM<sub>2.5</sub> Emissions (annual)

2008 National Emission Inventory: 2,449,000 tons

2008 Residential Wood Combustion:(~13%): 318,323 tons

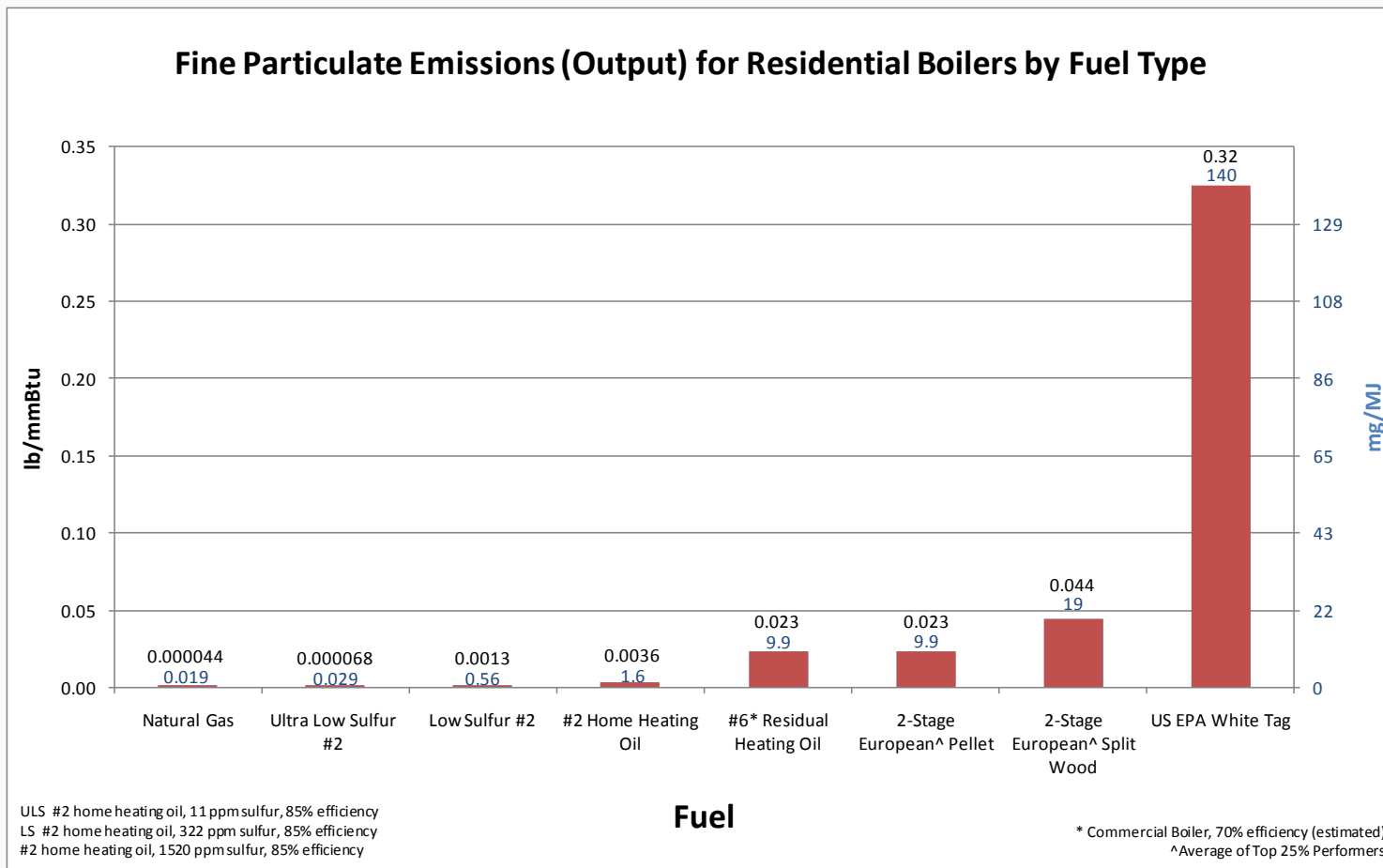
Hydronic Heater: outdoor 50,427 tons

Furnace: indoor, cordwood-fired, non-certified 36,213 tons

Rest: fireplaces, woodstoves (all types), outdoor wood-burning devices



# PM<sub>2.5</sub> Emissions (output) for Residential Boilers



## Voluntary Hydronic Heater (HH) Program

- January 2007 launched program
- 18 Phase 2 participating manufacturers
- Phase 1 models (70% cleaner) sold: 2,510
- Phase 2 models (90% cleaner) sold: 5,900
- Total ann tons PM<sub>2.5</sub> emissions avoided = 4,770
- \$1.7 to \$4.2 billion in health benefits in 2009

## Voluntary HH Program Components

- EPA and manufacturer Agreement to bring cleaner units to market
- Permanent label on qualifying models that states only dry seasoned wood should be burned, no trash...
- Hang tag – provides the emission levels
- Owner's Manual text on proper operation and maintenance
- EPA website with list of cleaner HH: [epa.gov/Burnwise](http://epa.gov/Burnwise)

(in combination with NESCAUM model rule)

## Voluntary HH Program - update

- EPA has temporarily suspended qualifying new HH models (due to comments on high efficiency numbers reported)
- States reviewing existing tests to ensure they were tested w/in specified precision of Method 28 OWHH; review to be completed by April 15.
- States want more QA/QC measures in Method 28 OWHH to ensure proper future testing by labs

## NESCAUM Model Rule for Outdoor HHs

- Emissions limits:
  - 0.44 lb/mmBtu (Ph 1)
  - 0.32 lb/mmBtu (Ph 2)
- Setback limits should vary according to emissions (next slide)
- No operation between April 15 & Sept 30 unless emission limits met
- Limits on types of fuel

## NESCAUM Model Rule – Recommended Setbacks/ Stack heights for Outdoor HHs

PM Emission limit (lb/MMBtu) heat input

	Not certified for Ph I/ II	Ph I - 0.44	Ph II - 0.32 (or 15 g/hr)
Before Mar 31, 2008	-Setback: 500 ft -Stackhgt: 5 ft above any roof structure w/in 150 ft		
After Mar 31, 2008		-Setback: 500 ft -Stack hgt: 5 ft above any roof structure w/in 150 ft	
After Mar 31, 2010			Setback: none Stack hgt: none [Commercial units: Setback: 300 ft Stack hgt: 5 ft above any roof structure w/in 150 ft]

## New England State HH Regulations

- All New England states have adopted or proposed regulations
- States with regulations that include emission limits (0.32 lb/mmBtu for new units) :
  - VT, ME, NH, and MA (adopted)
  - RI (effective Ap 14, 2011)
- CT: OWFs (aka HHs) installed after July 2005 have minimum setbacks & stack heights

## Background - NSPS

- Current New Source Performance Standards for New Residential Wood Heaters (promulgated Feb 1988) requires manufacturers to design new units to meet PM limits, and have each model line tested by EPA-accredited lab
- Attach EPA label after EPA approval
- Requires operation according to owner's manual
- Proposal was 1<sup>st</sup> regulatory negotiation by EPA that included industry, labs, states, and consumer advocates
- Not substantively reviewed until now

## Requests for NSPS for Hydronic Heaters

- Petition from 6 northeastern states plus Michigan and NESCAUM
- Request from HPBA Outdoor Wood-fired Hydronic Heater (OWHH) Caucus. Concerns:
  - “black eye” on industry; proliferation of local bans
  - State rules with differing requirements
- Many calls/emails from neighbors and others concerned about health effects



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

Appliance	Baseline (no NSPS changes)	Level I group	Level II group
Indoor Forced-Air Furnaces	3717	372	?
Hydronic Heaters (90% outdoor/10% indoor)	1627	162	81

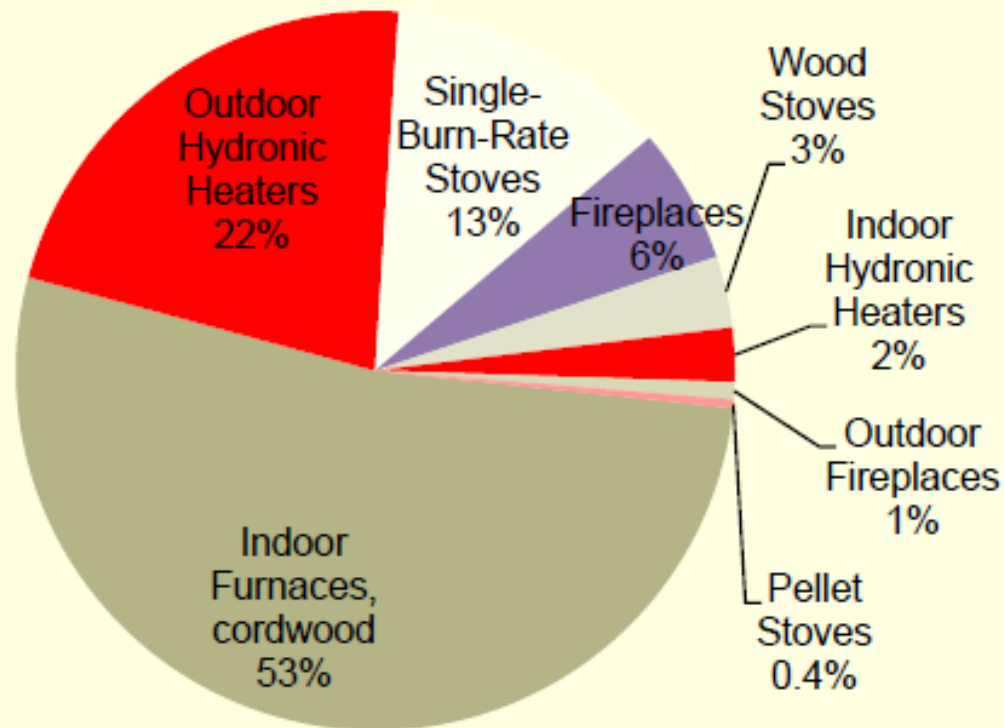
Level I = 0.32 lb/mmBTU heat output for outdoor HH in 2013 and indoor in 2014

Level II = 0.15 lb/mmBTU heat output for both outdoor and indoor HH in 2016



# Draft Analysis of Health Benefits - 2017

**Monetized Benefits Breakdown by Category**



These benefits incorporate the conversion from precursor emissions to ambient fine particles.

# Hydronic Heater (HH) Draft Options

- Typical emissions: >4 lb/mmBTU heat output
- EPA 2010 Ph 2 Program Qualifying Level:
  - 0.32 lb/mmBTU heat output (23 qualify)
- Typical State 2010 reg level: 0.32 lb / mmBTU heat output
- Draft NSPS limits for PM:
  - 0.32 lb/mmBTU heat output for outdoor HH in 2013 & 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 min/hr in field

## Forced-Air/Warm-Air Furnace Draft Options

- Canadian B415.1-10 level
  - 0.93 lb/mmBTU heat output
- Draft NSPS limit for PM
  - 0.93 lb/mmBTU heat output in 2014
  - Should limit be same as for HHs?
- Draft NSPS limit for CO
  - 1000 mg/m<sup>3</sup> at 12% O<sub>2</sub>
- Draft NSPS limit for VE: 6 min/hr in field

## Key Message and Dates

- EPA intends to regulate outdoor and indoor hydronic heaters and forced-air/warm-air furnaces
- Small Business Regulatory Enforcement Fairness Act (SBREFA) Panel
  - Final Report expected to be signed soon by SBA
- Proposal of NSPS – June 2011
- Final NSPS – July 2012

## Burn Wise Resources – Hydronic Heaters

- “Burning the right wood, the right way, in the right wood-burning appliance”
- Best burn practices (e.g., fuel type, storage, seasoning; maintaining air flow; safety advice; etc.)
- Outreach/educational materials
- Funding opportunities
- Info on Phase 2 white tag (about 90 % cleaner); list of EPA-qualified HHs
- Agencies - ordinances & regulations
- Case studies

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