

The Great American Wood Stove Changeout



2008 National Tribal Conference on Environmental Management

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www.epa.gov/woodstoves

Presentation Overview



- What's the Great American Woodstove Changeout
- Old Woodstoves vs. New Technologies
- Why should we care (health, safety, efficiency)?
- Funding Wood Stove Changeouts
- Education and Outreach Tools
- Libby, Montana Wood Stove Pilot - DVD

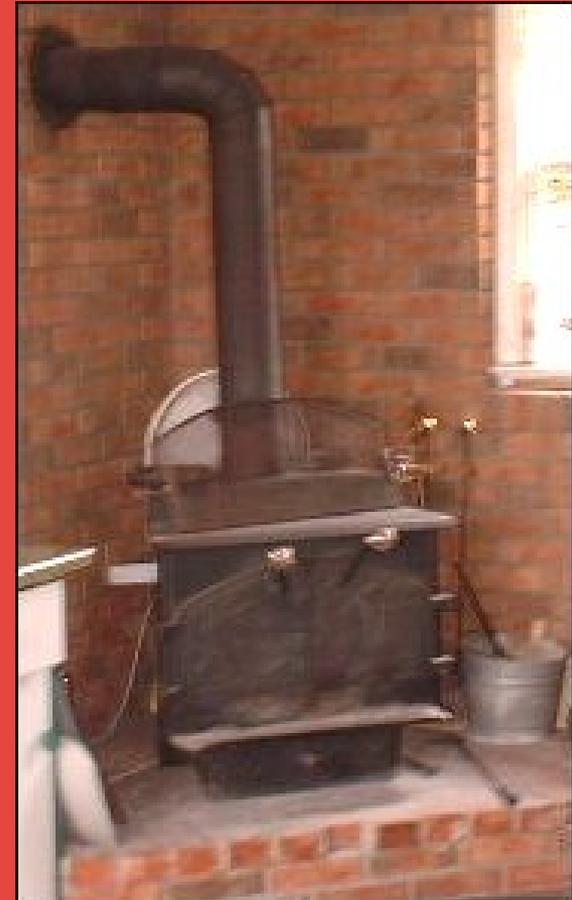
What is The Great American Wood Stove Changeout?



- A voluntary, incentive-based (cash rebates) effort to encourage owners of old, inefficient woodstoves to replace or “changeout” their stove with a cleaner burning hearth appliance, like:
 - Gas stoves
 - Wood pellet or corn stoves
 - EPA-Certified wood stoves



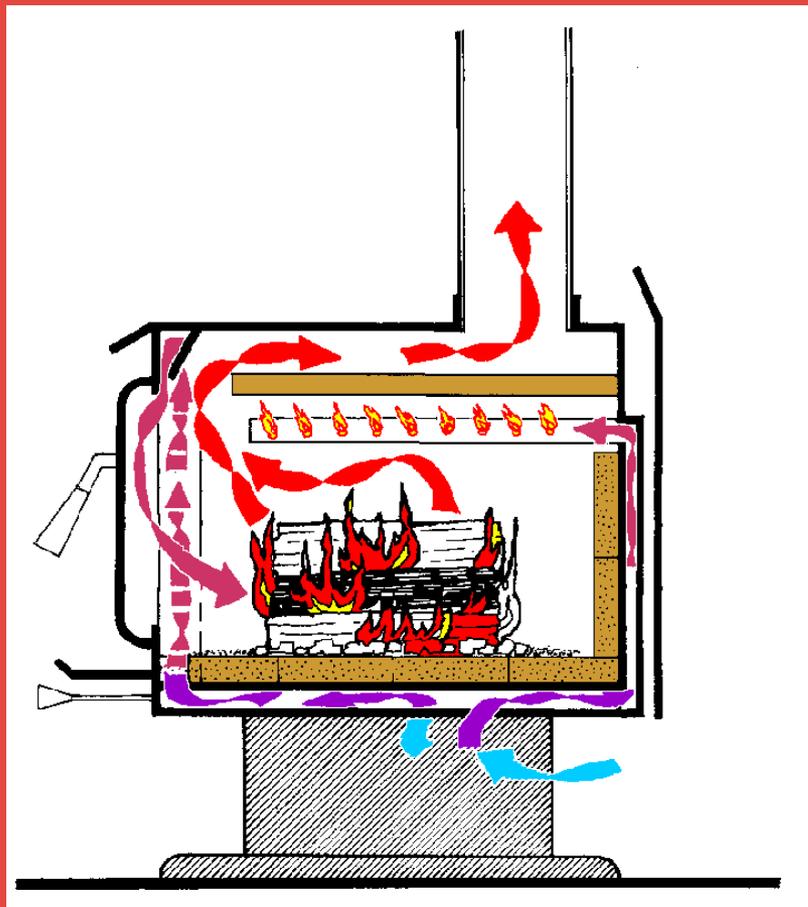
Old “Conventional” Wood Stoves Built before 1990



EPA - Certified Woodstoves (after 1990)



Inside a 'non-cat' wood stove



1. Firebox insulation
2. A large baffle
3. Preheated combustion air

How to Identify an EPA – certified Wood Stove



U.S. ENVIRONMENTAL PROTECTION AGENCY

Certified to comply with July, 1988 particulate emissions standards.

Date of Manufacture

2002	2003	2004	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<input type="checkbox"/>														

DO NOT COVER OR REMOVE THIS LABEL

Made in U.S.A.

3300-626



Goal – No Visible Smoke



Old Stove

EPA-Certified Wood Stove

Wood Pellet Stove



Gas and Propane Stoves



What's in wood smoke?

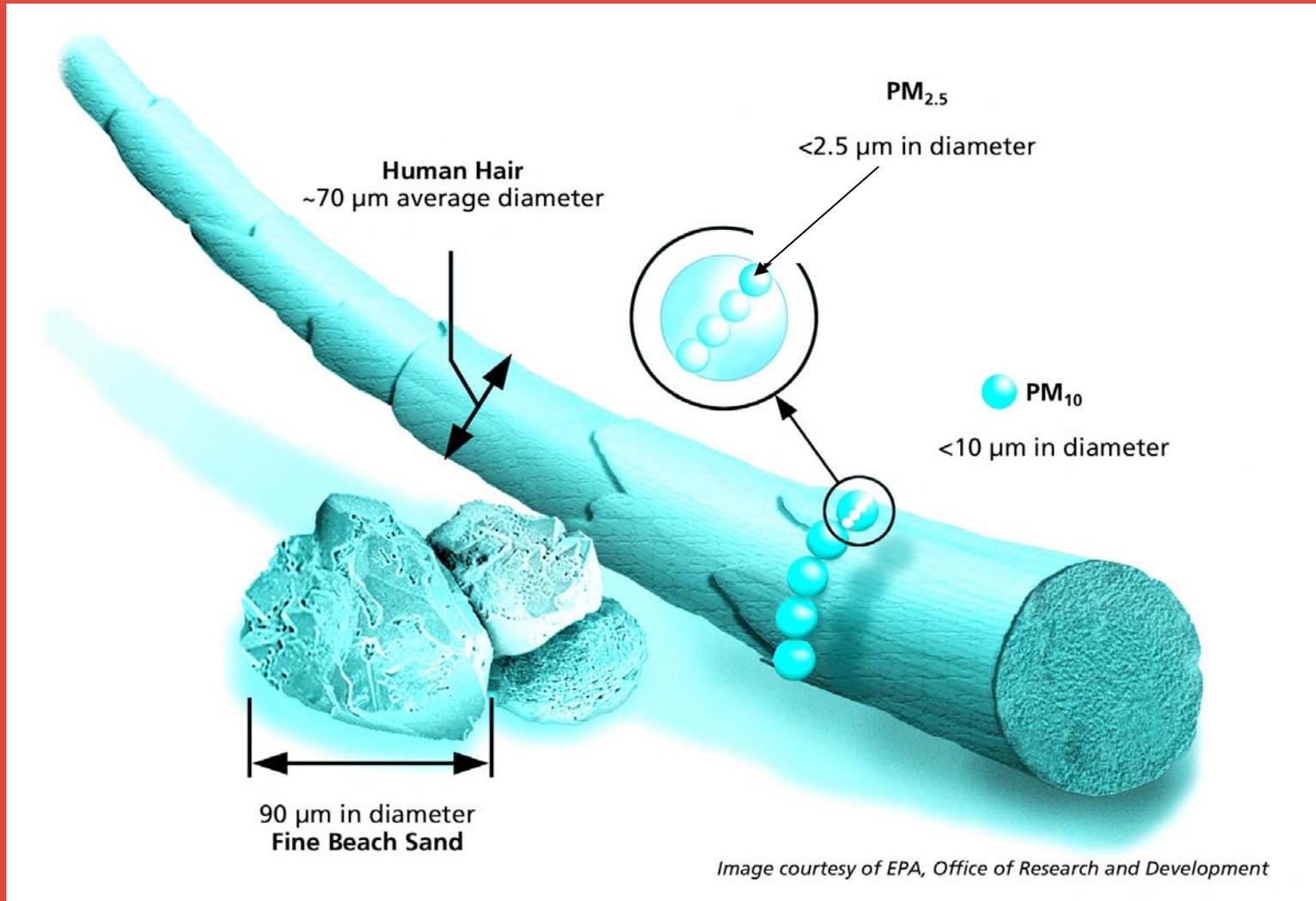


“Ah, the sweet smell of wood smoke” - but what makes it so sweet?

- CO, NO_x, SO_x, and Particle Matter (PM_{2.5})
- Toxics, including:
 - Benzene
 - Toluene
 - Aldehyde gases
 - Polycyclic organic matter
 - Dioxin

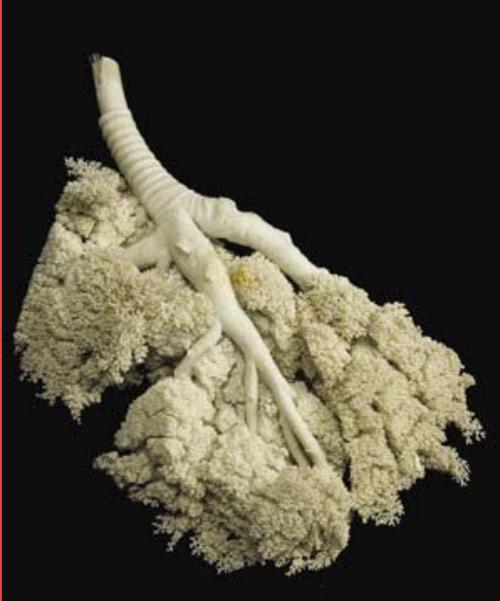
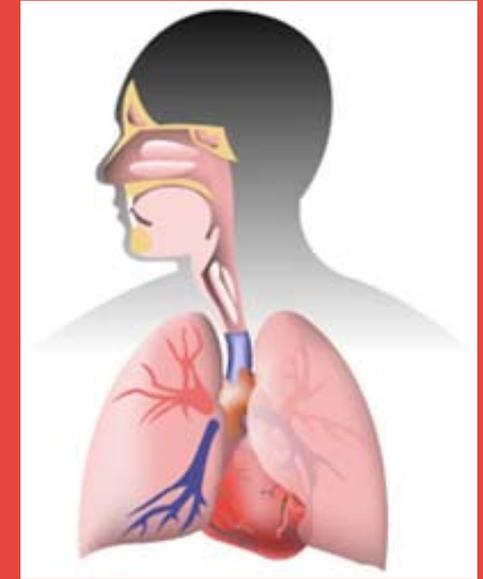
Particulate Matter: What is It?

A complex mixture of extremely small particles and liquid droplets



Particulate Matter

- Larger particles ($> PM_{10}$) deposit in the upper respiratory tract →
- Smaller, inhalable particles ($\leq PM_{10}$) penetrate deep into the lungs →



Model of interior human lung

Who's affected by wood smoke?



- Everyone, especially children and the elderly
- People with existing diseases such as:
 - Asthma
 - Chronic bronchitis and emphysema
 - Coronary artery disease
 - Heart failure



Why do we care about residential wood smoke?



- Residential wood burning in the U.S. emits 420,000 tons of fine particle pollution (PM_{2.5}) each year
 - More than all
 - Petroleum Refineries
 - Pulp and Paper Mills
 - Cement Manufacturers combined
- To put it in perspective:
 - Changing out 1 old, dirty, inefficient stove is equivalent to taking 5 old diesel buses off the road



- Low stacks
- Poor dispersion







How can a Wood Stove Changeout help your community?



- Improves the health of children, elderly and your community
- Improves safety of home
- Improves visibility
- Improves indoor air quality



2006/2007 Residential Fine Particle Indoor Air Quality Sampling, Libby MT



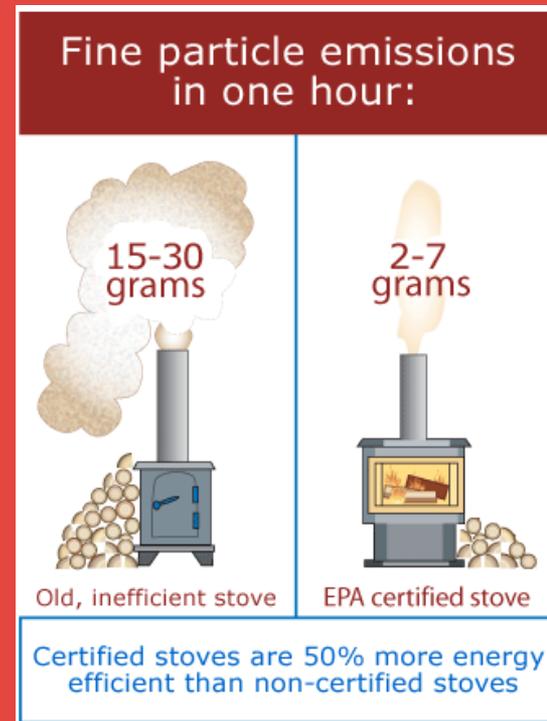
Findings from University of Montana

- Monitored before & after changeouts in 16 homes
- EPA health based standard for 24 hr exposure = $35 \mu\text{g}/\text{m}^3$
- Ave. Pre-changeout = $53.4 \mu\text{g}/\text{m}^3$
- Ave. Post-changeout = $15 \mu\text{g}/\text{m}^3$
- Ave. reduction in indoor $\text{PM}_{2.5}$ within 16 homes: 72%

Benefits to the Home Owner



- **Cleaner Burning Technologies:**
 - Pollute less – 70% less PM_{2.5} outdoors, improves indoor air
 - Are 50% more energy efficient
 - Use 1/3 less wood for same heat
 - Cut creosote buildup in chimneys, reducing fire risk
 - Save money and require less work





Potential Sources of Funding



- Supplemental Environmental Projects
- Foundations/Big Businesses
- Hearth Industry Rebates/Discounts/Efforts
- Federal Funds
 - HUD: Block Grant
 - USDA: Rural Development Grant/Loans
 - DOE: Low-income weatherization
 - EPA: EJ, Indoor Air, Community Grants



EPA Funding/Assistance

- Community Action for a Renewed Environment
 - <http://www.fedgrants.gov/Applicants/EPA/OGD/GAD/OAR-IO-05-08/Grant.html>
- Partnership for Clean Indoor Air Outreach, Communication and Education
 - http://www.epa.gov/air/grants_funding.html
- Environmental Justice
 - <http://www.epa.gov/compliance/environmentaljustice/grants/index.html>



HUD Office of Community Planning and Development



Rural Housing and Economic Development Program (RHED): (\$16.8 M available in FY 2007)

- For innovative housing activities and economic development in rural areas and includes tribal lands.
 - Non-profit organization, e.g., United South & Eastern Tribes, could apply for RHED funds to cover costs related to changing out wood stoves on a reservation for Low-Income households.
 - Maximum RHED grant is \$300,000 in any given year.

For Program Descriptions: www.hud.gov/funds/index.cfm

U.S. Dept. of Housing and Urban Development – Office of Native American Programs



- **Indian Housing Block Grant Program (IHBG)**
(\$624 million available in FY 2007)
 - Most Tribes/Tribally Designated Housing Dept. receive IHBG funds through this program
 - Have discretion to do most anything housing-related with IHBG
 - Wood stove changeouts would be an eligible activity for Low Income households (80% of the Area Median Income = Low Income)

Potential Funding: USDA Grant and Loan Program



Home Improvement Loans & Grant Program (\$30 mill. for grants & \$30 mill for loans)

- Loans: are available to lower income rural (less than 10,000 population) to make repairs.
- Grants (\$7,000): are available to enable *very* low-income, rural elderly (62 +) homeowners to remove health and safety hazards from their homes.
- Administrative funds may be available to manage these grants, depends on your USDA local office.

For more info: www.rurdev.usda.gov/rhs/



Education and Outreach: Tools



Significant improvements without changeouts can be realized:

- **Burn Smart Campaign - tools available:**
 - Brochures
 - Fact Sheets
 - Posters
 - Videos/DVD
 - Workshops

Cleaner Air.
Cheaper Heat.
Safer Home.



Replace Your
Old Woodstove
and Save!



A U.S. Environmental Protection Agency Partnership



BURN CLEAN

HOT TIPS FOR A BETTER FIRE

Did you know that by changing the way you burn wood in your woodstove, you can save money, reduce air pollution and protect your health.

Here are a few simple tips to make your fire burn hotter, keep your wallet fatter and keep your local air cleaner and healthier to breathe when using your woodstove:

Upgrade to an EPA-certified woodstove or other clean burning technology. All new stoves are EPA-certified and burn cleaner and more efficiently. A clean-burning stove emits far less particle pollution – 70 percent less, on average – than an older, less-efficient stove (or a fireplace insert). They also use approximately 30 percent less wood.

Choose the right firewood. Hardwoods are the best. Regardless, never burn trash or treated wood which can emit toxic air pollutants.

Season all firewood. All firewood should be split, securely covered or stored, and aged for at least six months. Seasoned wood burns hotter, cuts fuel consumption and reduces the amount of smoke your woodstove produces.

Choose the right size stove. A stove that is too large for a room will need to be dampered down so it doesn't overheat the space. This can waste wood, which in turn wastes your money.

Clean ashes from the stove. Excess ashes can clog stove's air intake vents, reducing its efficiency. Discard after they are completely extinguished. Do not leave the metal ash container near the house or near any flammable material. This could start a fire!

Begin with a quick hot start. Open the woodstove draft to maximum, and start the fire with a manufactured firestarter or crumpled paper and kindling. As the kindling burns, add smaller pieces of firewood followed by larger pieces until the fire is bright and hot.

Always burn small hot fires. These fires provide the maximum in heat, while cutting fuel consumption and reducing pollution.

Don't let the fire smolder. Many people think they should let a fire smolder overnight. But reducing the stove's air supply does little for heating and can increase air pollution.

Keep your chimney clean to provide good draft for your stove and to reduce risk of a chimney fire. Have a certified chimney sweep inspect your chimney once a year or after every three cords of wood. For safety, never leave a fire unattended.



For more information about burning clean, go to www.epa.gov/woodstoves



Cleaner Air Efficient Heat Safer Home

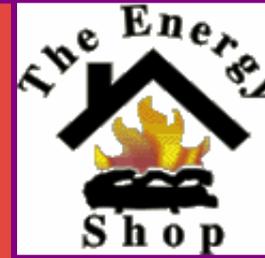


Replace Your Old Woodstove!

Protect tribal community and indoor air quality, create a warmer and safer home, and reduce the amount of money spent on home heating bills. For information on cleaner wood burning and the changeout of old woodstoves, go to www.epa.gov/woodstoves or www.woodstovechangeout.org.



Oneida Nation Woodstove Changeout



Pilot Project and Success Story



- Libby, MT
 - Non-attainment for PM_{2.5} annual standard
 - 82% of PM_{2.5} came from wood smoke
 - Changed out 1,100 wood stoves
 - Preliminary data suggests significant improvement in indoor and outdoor air quality

Wood stove changeouts are happening: 2005-2008



- Yolo-Solano, CA
- Butte County, CA
- Placer County, CA
- Shasta Co., CA
- San Joaquin, CA
- Delta County, CO
- Preston, ID
- Pinehurst, ID
- **Nez Perce Tribe, ID**
- Ravalli, Gallatin Co., MT
- Questa, NM
- Washoe County, NV
- Washington Co., OH
- Klamath Fall, OR
- Oakridge, OR
- SW Pennsylvania
- Christiansburg, VA
- Rutland, VT
- **Oneida Tribe, WI**
- Darrington, WA
- Ferry and Steven Co., WA
- Marysville, WA
- Tacoma, WA
- Pend Oriella Co., WA
- WA Spokane, WA
- **Swinomish Tribe, WA**
- Yakima, WA
- Whatcom/Island Co., WA

How can EPA help?



- Wood Stove Changeout Tools
 - Example brochures, posters, fact sheets, video footage available, case studies
- Strong Partnerships (e.g., hearth industry, American Lung Association)
- Options for securing funds, (e.g., grants, industry rebates, SEPs)
- Technical assistance

Summary/Questions



We believe this voluntary effort:

- Is a very effective tool for addressing indoor air quality issues and safety
- Tools and examples are available, but financial incentives are a challenge
- We have willing partners;
- Questions?

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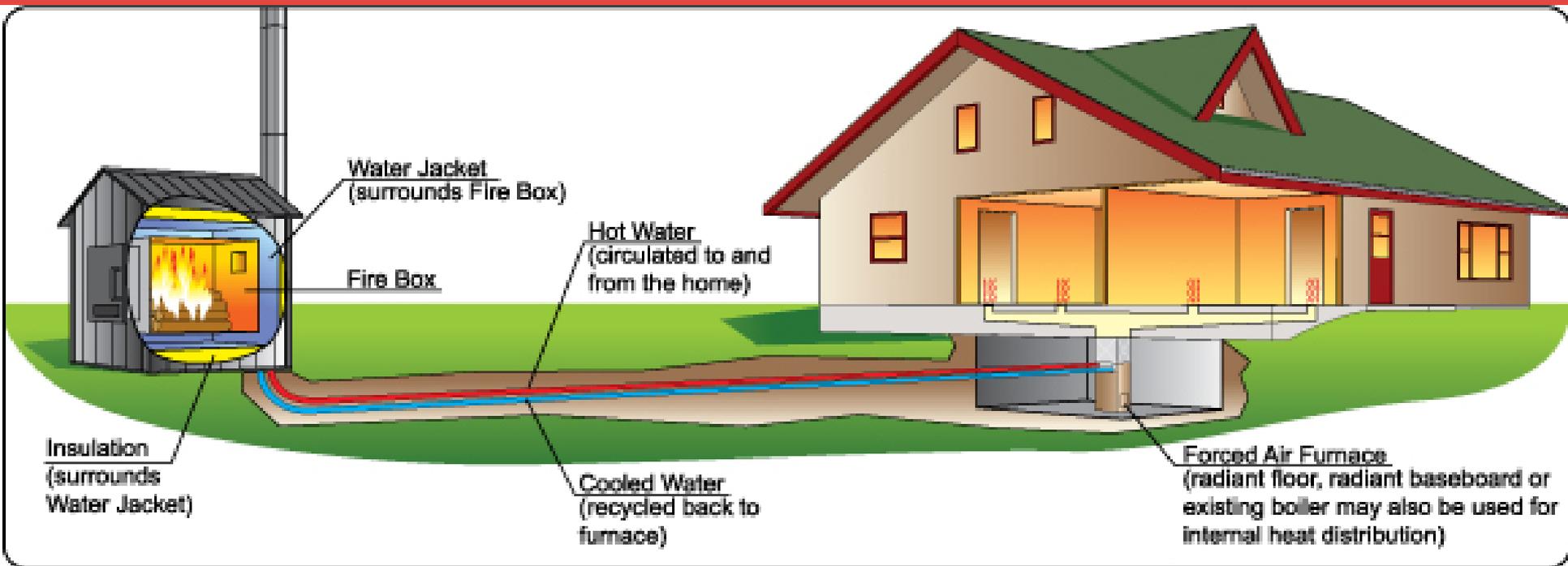
Supporting Slides to Main Presentation

U.S. EPA Office of Air Quality Planning and Standards

<http://www.epa.gov/woodstoves>

How an Outdoor Wood-fired Hydronic Heater Works

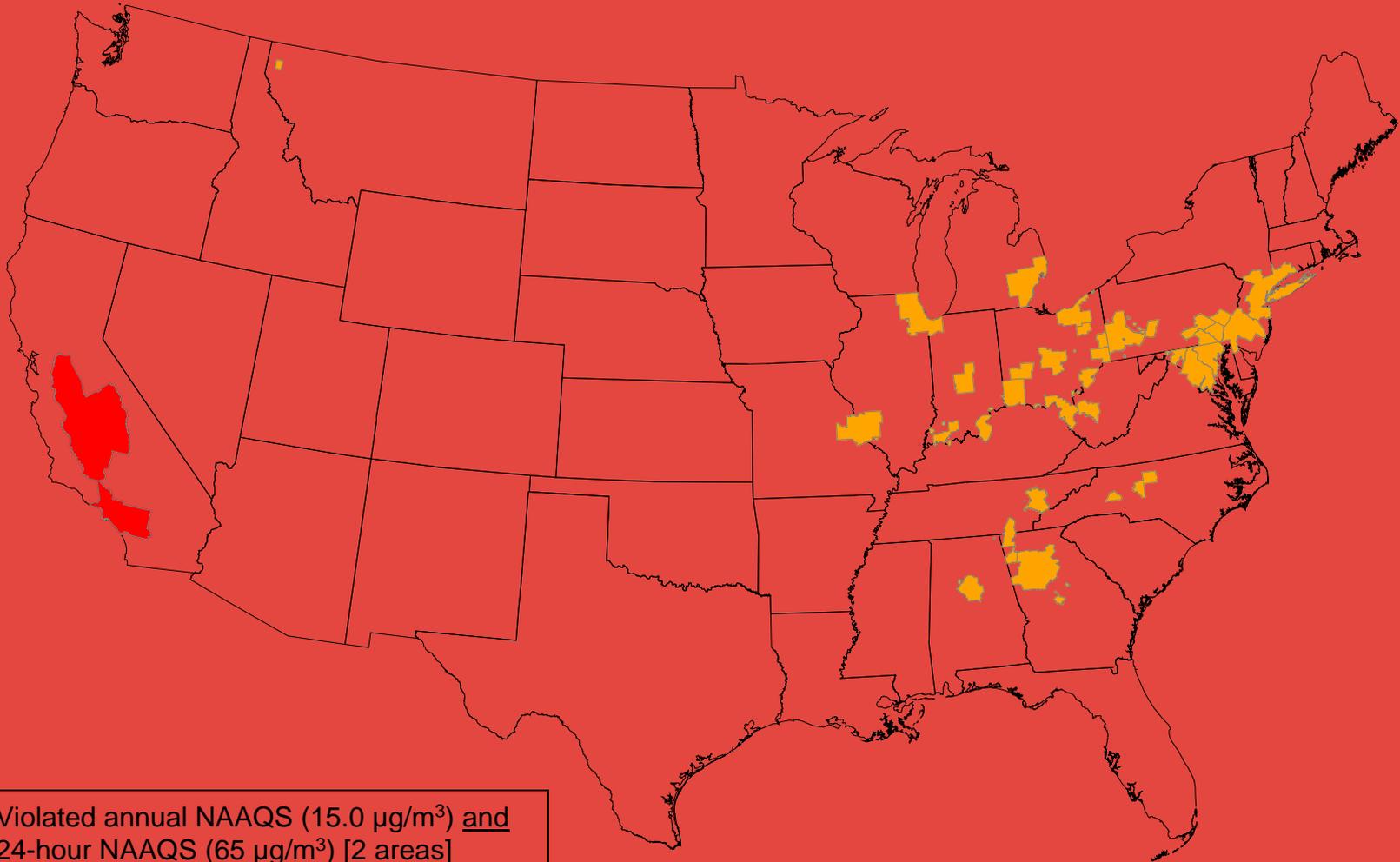
http://www.epa.gov/owhh/what_epa_doing.htm





Currently Designated PM_{2.5} Nonattainment Areas - 1997 Standards

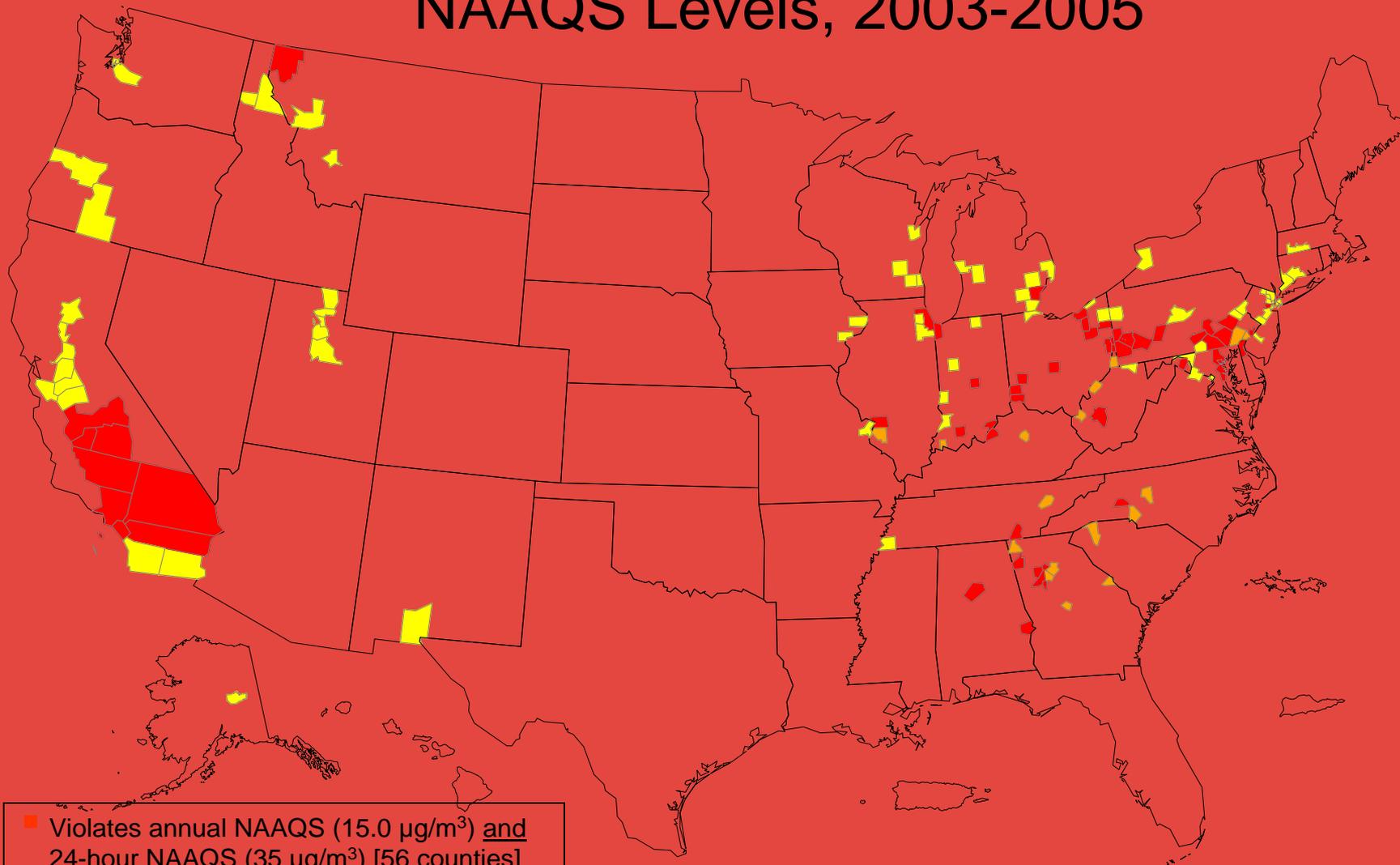
Violated annual and/or 24-hour NAAQS with designated data (2001-2003*)



- Violated annual NAAQS (15.0 $\mu\text{g}/\text{m}^3$) and 24-hour NAAQS (65 $\mu\text{g}/\text{m}^3$) [2 areas]
- Violated only 24-hour NAAQS (65 $\mu\text{g}/\text{m}^3$) [0 areas]
- Violated only annual NAAQS (15.0 $\mu\text{g}/\text{m}^3$) [37 areas]

* 2002-2004 data were considered in the designation process but all nonattainment designations were based on 2001-2003 data

Counties Exceeding New 24 hour NAAQS Levels, 2003-2005



- Violates annual NAAQS ($15.0 \mu\text{g}/\text{m}^3$) and 24-hour NAAQS ($35 \mu\text{g}/\text{m}^3$) [56 counties]
- Violates only 24-hour NAAQS ($35 \mu\text{g}/\text{m}^3$) [70 counties]
- Violates only annual NAAQS ($15.0 \mu\text{g}/\text{m}^3$) [17 counties]

- Data from AQS 7/10/2006
- Completeness criteria: 2006 CFR or 11+ samples per quarter



How do I get started?



- **Identify potential partners**
 - e.g. local elected officials, non-profits, industry
- **Identify sources of funding**
 - e.g. in-store discounts, supplemental environmental projects (SEPs), local utility companies, USDA and HUD grants
- **Develop a project plan**
 - determine staff, timing, resources and set goals