

**East-West Lessons Learned Woodstove Changeout Workshop
Atlanta, Georgia
February 24, 2005**

**Sponsored by U.S. EPA and Metro 4 and Southeastern States Air Resources
Managers**

Summary of Proceedings



Stop Wasting. Start Saving.

April 20, 2005

Note: Logo is draft and subject to change.

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I. Executive Summary

The U.S. Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards (OAQPS), in partnership with State, local, and tribal government organizations, organized and presented a workshop to present and exchange information on woodstove changeout programs. This workshop was held in conjunction with the Hearth, Patio, and Barbecue Association (HPBA) EXPO 2005 program and exhibit. The meeting agenda is included as Attachment A.

Key recommendations for future action that arose from this workshop are:

- EPA should continue to quantify the wood smoke problem through measurements and possibly receptor modeling; continue to improve emission inventory data; continue to research emission reductions.
- Efforts should be focused on where there is a problem; understand the source of the problem in your area before undertaking a changeout program; count homes, conduct surveys, etc. to identify number of woodstoves vs. fireplaces; understand the fuels used and fuel costs.
- EPA should serve as a clearinghouse for information, providing “one-stop shopping” source of credible information.
- EPA should serve as the national-level connection between State/local/tribal agencies, HPBA utility companies, and other stakeholders.
- Tribes have particular concerns about indoor air exposures and the affordability of new stoves that should be considered.
- EPA should provide help to communities on ordinances/by-laws (e.g., templates, case studies).
- EPA should conduct further research on emissions from manufactured logs.
- Based on the success of this workshop, additional workshops should be held, and various locations should be considered, to continue information sharing and to build on the enthusiasm that exists for woodstove changeout programs.

II. Workshop Date and Location

February 24, 2005, 10:30 am - 5:30 pm
Room C109
Hearth, Patio, and Barbecue Association EXPO 2005
Georgia World Congress Center
Atlanta, Georgia

III. Attendees

There were participants in this meeting in person, via conference phone and over the internet via WebEx. The full list of meeting attendees is presented in Attachment B.

IV. Introductions and Opening Remarks

John Hornback, Executive Director, Metro4/SESARM opened the meeting by welcoming meeting participants. Everyone attending was asked to introduce themselves and to list their objectives for the meeting. The following objectives were listed:

- To learn from everyone else.
- To share experiences.
- Interested in voluntary programs.
- To understand the initiative.
- No experience in voluntary programs – to learn.
- To post what I learn on the web.
- To listen.
- To understand how to get the public to “buy in.”
- To get info and set up a program for my tribe.
- To get more info to improve air program.
- Issue inside homes – tribes looking for technology.
- To help clean the air.
- To help keep my area clean.
- Want to add changeout program.
- Past denial – time to address it.
- To get tips on how to proceed.
- Looking for ways to reduce emissions.
- To reduce number of asthma attacks



Workshop participants gather for the start of the presentations.

Carol Kemker, Deputy Director of EPA Region 4's Air, Pesticides, and Toxics Management Division, welcomed meeting participants to Atlanta, and offered opening comments on the importance of controlling fine particulate emissions. Although, in general, air quality is improving, she emphasized that there is still work remaining. To illustrate the big impact of fine particulate emissions on public health, she cited EPA estimates of 15,000 premature deaths, 75,000 cases of chronic bronchitis, 10,000 hospital admissions for respiratory and cardiovascular diseases, 20,000 cases of acute bronchitis, hundreds of thousands of occurrences of aggravated asthma, and 3.1 million days of missed work due to particle-related symptoms. In EPA Region 4

alone, there are 14 areas classified as non-attainment for fine particulate. Nine million people live in these areas, which include 52 counties in five states. Local action is needed to help reduce these emissions. Action to reduce fine particulates from woodstoves and other sources will have the added benefit of also reducing air toxics and ozone.

V. Summary of Formal Presentations

A series of presentations were then made by EPA, State and local agency representatives. These presentations, and questions and comments following each presentation, are summarized below. Additional details are shown on the slides from each of these presentations, included in Attachment C.

Voluntary Residential Wood Smoke Reduction Initiative presented by Karen Blanchard, EPA/OAQPS

Ms. Blanchard gave an overview of EPA's Voluntary Residential Wood Smoke Reduction Initiative. The main focus of the initiative is changing out old woodstoves and fireplace inserts. Other components are the "Burn Clean" National Education and Outreach Campaign, and examining ways to reduce emissions from fireplaces, woodstoves and outdoor wood boilers, including both regulatory and non-regulatory approaches. There is an opportunity to achieve substantial particulate emission reductions if the 8 - 9 million old woodstoves in use are replaced with the cleaner burning, more efficient technologies that are available today. A major challenge is affordability - replacement with new, cleaner alternatives is relatively expensive, especially for low income people, and many people who have to rely on wood as a primary heat source cannot afford new stoves, even after the discounts or rebates offered in past woodstove changeouts. EPA's campaign includes several pilot projects and demonstration grants, and preparation of materials to support design and implementation of changeout programs, including a "how to" document that includes lessons learned from previous changeout programs, public education and media outreach materials, and guidance for quantifying emission reductions for SIP credits. Pilot changeout programs are being planned by EPA and its partners for the fall of 2005 in Libby, MT, Pittsburgh, PA, and possibly Dayton, OH. Changeout programs will be conducted in additional locations in FY 2006, if funding becomes available. Over the long term, growing this effort into a national program is the plan. Ms. Blanchard's presentation slides include more details on the pilot programs, demonstration grants, Enforcement Settlement Agreement Funds as a possible source of funding for changeouts, and EPA's National Education and Outreach Campaign. She also described an effort underway to estimate the magnitude of emissions from outdoor wood boilers, development of a test method for fireplace emissions, proposed research on possible dioxin emissions from manufactured logs, consideration by EPA regarding revisions to the woodstove new source performance standard (NSPS). Ms. Blanchard concluded her presentation by describing key considerations from the EPA's perspective, citing the energy and support for changeout programs both inside and outside of EPA, encouraging feedback (comments, concerns, suggestions, support) from the audience and emphasizing EPA's desire to work with States, local agencies, tribes, and other partners.

Comments and questions following Ms. Blanchard's presentation:

- Questions concerning development of EPA's "How to" document and other materials were referred to Mary Ann Warner of EPA/OAQPS (warner.maryann@epa.gov or (919) 541-1192).

- Question: *Are old woodstoves those that are pre-1988?*

Answer: Yes

- Question: *What kind of ambient monitoring will be done in Libby, MT, indoor, outdoor, or both?*

Answer: The State of Montana will conduct outdoor monitoring for PM_{2.5} and the trade association is funding a study through the University of Montana for polynuclear aromatic hydrocarbons.

- Question: *Due to year-to-year variations in weather, might the money for a one-year monitoring program be better spent on changeouts?*

Answer: Over 80 percent of emissions in Libby are from woodstoves (there are no other PM sources in Libby, other than cars and people), so EPA believes it will be able to detect the change resulting from the pilot changeout program there. While EPA agrees, however, that weather variations could be a factor, the money is well worth the effort because it will help to support the benefits assessment needed to argue the case for more changeout programs in other locations.

- Comment: *In Indian country, a different, larger issue (and health problem) for them is exposure inside the home to CO and PM_{2.5}. Low incomes and limited/no natural gas availability affect their ability to do changeouts. They depend on EPA grants.*

Response: Keep making these points and please send any available data regarding indoor exposures to EPA. As we grow the program into additional locations in the coming years, we will be mindful of the need to also consider this program for Tribal lands.

Nature and Magnitude of the Wood Smoke Problem presented by Larry Brockman, EPA/OAQPS

In his presentation, Mr. Brockman provided an overview of potential health effects of exposure to wood smoke, PM_{2.5} emission inventory information, PM_{2.5} source apportionment information and information on hazardous air pollutants (HAPs) in wood smoke. In addition to fine particulate, wood smoke contains benzene, toluene, formaldehyde, polycyclic organic matter, carbon monoxide (CO), nitrogen oxides (NO_x), and sulfur oxides (SO_x). Mr. Brockman emphasized that the impacts of wood smoke emission on human health are substantial, restating the estimated impacts cited earlier by Ms. Kemker in her remarks. Mr. Brockman showed a map illustrating areas in the U.S. designated as nonattainment for PM_{2.5}, and noted the significant contribution of the 40 - 45 million wood burning appliances (of which about 15 million are woodstoves) to the problem. Eighty to ninety percent of these stoves are pre-NSPS (i.e., older than 1988). However, EPA believes that only 10 million woodstoves are in use. Although it is

difficult to determine how many old stoves there are in a particular locality, data available from the U.S. Census American Housing Survey, market research firms, and State, local tribal and other surveys may be helpful. Due to several factors, human exposure to wood smoke PM in some localities may be higher than PM from industrial sources. Short term (acute) exposures to PM_{2.5} are a concern in some areas, and over 40 communities have burn bans. Mr. Brockman described PM source apportionment data, concluding that the amount of biomass burning that is residential wood is significant, although the amount is uncertain, and that more research is needed. He also presented estimates of residential wood smoke PM_{2.5} emissions from EPA and State emission inventories, and from recent MARAMA and NESCAUM surveys. He noted that EPA's estimates are more reliable at higher levels of aggregation than at the county level or lower. Additional concerns related to wood smoke emissions cited by Mr. Brockman were polycyclic aromatic hydrocarbons (PAH), indoor air exposures, and fire safety.

Comments and questions following Mr. Brockman's presentation:

- Question: *What about dioxin emissions?*

Answer: There is limited data available on dioxin, and more research has been requested on this. EPA's previous conclusion was that PM emissions so overwhelmed dioxin that the main health risk of concern is due to PM exposure.

- Comment: *Recognize that if you work through State and local agencies, this doesn't address tribal problems.*

Response: EPA intends to also work with tribes.

- Question: *How much confidence does EPA have in its PAH data?*

Answer: EPA has a relatively high degree of confidence in its PAH data.

- Question: *What is the basis of the EPA and State inventory data in the bar graphs shown?*

Answer: The information shown is from the 1999 inventory and shows what the States estimated versus what EPA estimated. About 22 States submitted data, and each State may have different estimation methods. The questioner (from South Coast) will follow up with a call to Roy Huntley to discuss further the methodology for estimating emissions in the inventory.

Bay Area Woodstove Changeout Program

presented by Teresa Lee - Director, Public Information & Outreach Office
and Ralph Borrmann, Public Information Officer
Bay Area Air Quality Management District

Ms. Lee and Mr. Borrmann described the current approaches used by their agency to reduce wood smoke emissions in the San Francisco Bay area, and some earlier experiences with attempted changeout programs. The authority of their agency covers nine counties with approximately seven million people. Their wintertime particulate strategy includes a "Spare the Air Tonight" program, model ordinance, and a wood smoke rebate program. They have a

website, www.sparetheair.org, that provides information on the health effects of wood smoke, and on each component of their particulate strategy. Under the Spare the Air Tonight program, the agency issues advisories from November through February when PM_{2.5} air quality index readings are expected to exceed 150, and asks the public to drive less and not burn wood. Their model ordinance is a guidance document for use by cities and counties that addresses the new construction or replacement of woodburning appliances. A wood smoke rebate program, sponsored by Silicon Valley Power (as part of a mitigation plan for a new plant) and administered by the Air District, is currently available to homeowners in Santa Clara County. The program (modeled on the Great Stove Changeout and Three Mountain Power Project in Burney, CA) offers a \$100 rebate to retrofit an existing fireplace with a gas log set or new insert, and \$300 to replace a pre-1990 woodstove or insert with a new gas appliance. A rebate applicant must obtain and submit a recycling receipt documenting that their old stove was recycled. A local recycler provides this service at no cost, and this seems to be working well. About 1,300 changeouts have been realized thus far under the Silicon Valley Power program. Mr. Borrman also described earlier programs. A program coordinated with Calpine Energy involved a direct mail campaign to about 17,000 households near a Calpine power plant. Rebates of \$300 to \$500 were offered for wood to gas conversions only. There was little response to this campaign. The respondents tended to be older people who owned their homes and had disposable income. Their motivation to changeout were issues of convenience (e.g., didn't want to chop wood any more). Further, in contrast to their consultant's projections, fewer woodstoves were replaced as compared to fireplace retrofits (only one woodstove per nine fireplace retrofits, as opposed to a projection of 50/50). A SoCalGas utility rebate program, not currently in effect, was also described as an alternative approach, sold from an energy efficiency perspective. A "Fireside Living" gas logs winter program was started in 1997, and promoted decorative gas logs as alternatives to wood burning. A similar "Fireside Living" stoves fall program was started in 1998 that promoted awareness of natural gas fireplaces and stoves and their efficiency and zone heating benefits. Rebate coupons of \$25 (gas logs) or \$125 (gas fireplaces or stoves) were provided with the cost shared equally by manufacturers and retailers. About 6,000 changeouts per year were being realized under this program before it was stopped.

Comments and questions following the presentation by Ms. Lee and Mr. Borrman:

- Question: *Any thoughts on funding sources where there is no rebate money available?*

Answer: The Calpine Energy money was available due to a mandate to lower emissions. Supplemental Environmental Projects (SEPs), manufacturers and retailers may also be sources. There is no question that more sources of funding are needed. It's also important to talk to HPBA as a group about funding support; HPBA is enthusiastic about changeouts.

- Question: *What was the source of the 50/50 miscalculation on stoves vs. fireplaces in the Calpine program?*

Answer: The projection was based on the Burney, CA changeout program, that turned out not to be representative of the households covered by the Calpine program.

- Comment: *It's hard to get real data on fireplaces, although SoCalGas says they do have data.*

• Comment: *EPA is talking with HPBA about manufacturer/dealer rebates. Rebates in the range of 10 to 15 percent are likely.*

• Question: *How many stoves have you changed out under the current program?*

Answer: About 1,300 have been replaced so far.

• Question: *Was there a net reduction in emissions from these 2 programs (Silicon Valley Power and Calpine)?*

Answer: In the end, a reduction in emissions has to be shown. The reduction is tied primarily to the number of stoves replaced.

• Question: *How are you estimating emissions?*

Answer: Terry can make available the emission factors used by their consultant. Terry's phone number is (415) 749-4900.

• Comment: *EPA thinks an emission reduction of about 70 percent can be achieved by switching from an older stove to an EPA certified woodstove, and a greater reduction achieved with a switch to natural gas.*

The Puget Sound Wood Smoke Control Program
presented by James Nolan, Director - Compliance

Mr. Nolan began his presentation by showing a graph illustrating 3-year average daily maximum concentration of PM₁₀ in King County vs. the Federal standard. He then showed a second graph showing elevated ambient concentrations of PM_{2.5} monitored in January 2005 at a location in his agency's jurisdiction, and indicated that PM_{2.5} emissions are a continuing problem. There are about 500,000 fireplaces and 100,000 woodstoves in use and his agency has concluded that wood smoke and, in particular, wood smoke emissions from fireplaces are the big problem in their area. He noted that high wood smoke emissions occur concurrent with events such as holidays and Superbowl Sunday. Further, his agency believes that the answer to wood smoke is reliance on central heat with gas or oil (rather than heating with wood), and for those who like the ambiance of a flame, a gas appliance. The basic elements of their wood smoke control program are encouraging changes from wood to a cleaner form of heat (natural gas, propane, oil, pellet, or from uncertified to certified stoves); pollution prevention; burn bans; complaint response; educating the public about the health effects of wood smoke; and discouraging installation of wood burning appliances in new multiple unit buildings and single family housing developments. They encourage changeouts of uncertified stoves through advertising, funding assistance, and implementation efforts that include media campaigns (e.g., they have a good relationship with a local TV meteorologist) specific events, and burn bans. Funding sources have included direct agency subsidies for a portion of the changeout and disposal of old stoves, SEP money, and companies seeking to build new plants who will pay to reduce wood smoke as part of their permit mitigation plan. Wood smoke pollution is discouraged through public education on proper burning practices, connecting people with existing energy conservation programs

(weatherization), and promoting the use of compressed wood logs as an option to reduce wood smoke from open fireplaces for those who cannot switch to gas logs. In conclusion, Mr. Nolan offered the following advice regarding future changeout programs: (1) have patience; (2) recognize that people are in denial about wood smoke as a problem; (3) be ready for bad press; (4) know what the mix of devices in your region (e.g., number of woodstoves vs. fireplaces); (5) recognize that new woodstoves cost as much as a new forced air furnace; (6) recognize that manufactured logs are a cost-effective option for open fireplaces; and (7) focus the message on the wood smoke, not the wood burner.

Comments and questions following Mr. Nolan's presentation:

- Question: *Do you have data that show wood smoke emissions are higher on Superbowl Sunday and on holidays?*

Answer: Yes. The University of Washington and others have done a great deal of research on this.

- Question: *Have you focused on fireplaces?*

Answer: Yes. That is where we have put resources. An example is a promotion to give away compressed wood logs during the holidays.

- Comment: *Phone surveys on fireplace usage conducted by our agency (Bay area) indicate that 1/3 of fireplace owners don't use them at all, 1/3 burn only on holidays, and 1/3 burn four or more times a week.*

- Question: *Our area has a lot of development. Isn't this (how to control wood smoke emissions) also a growth management decision?*

Answer: Restrictions put on the type of appliances in new construction typically have mixed results. Luckily, the market is moving towards gas logs in new construction.

- Question: *Can you clarify the spikes in your graph of monitored PM_{2.5} concentrations? More specifically, is it due to fireplaces or woodstoves?*

Answer: We don't know for sure, but expect that about 1/2 of wood burning appliance owners in Seattle light up at night. This varies, however, from community to community.

- Question: *What success have you had with rebates?*

Answer: Very little. Marketing by the gas companies is where the most success has been realized.

- Comment: *Regarding health effects, Dr. Joellen Lewtas at the University of Washington has shown that wood smoke emissions are more mutagenic than cigarette smoke. Regarding changeout options, it should be noted that gas is not available everywhere.*

• Comment: *A high rate of toxins in manufactured logs led our agency (Bay Area) to not recommend these. Our evaluation of manufactured logs included working with the Duraflame company.*

Response: It is recommended that EPA conduct further research on emissions from manufactured logs.

• Comment: *A concern for tribes as far as making homes more energy efficient (weatherization) is that the more you tighten them up, the worse the inside air becomes .*

• Question: *For places where there is not funding to support changeouts, what means are there to get more efficiency in a program?*

Answer: Talk to dealers and chimney sweeps. A report by Jim Houk of OMNI, referenced on the EPA web site www.epa.gov/ttn/chief/ap42/ch01/related/woodstove.pdf, can also be a good source of information.

• Question: *Have you worked with home insurance companies?*

Answer: They have expressed no interest, nor have lenders.



A chart illustrates relative emissions of uncertified woodstoves versus cleaner technologies.

Woodstove Rebate Program

presented by Bob West, Yakima Regional Clean Air Authority (YRCAA)

Mr. West began by describing Yakima, Washington as a rural, conservative community. A “loan” program to promote woodstove changeouts was tried in the early 1990's. However, it was expensive (about \$96,000 to change out 93 stoves), inefficient, and labor intensive. In contrast, a more recent rebate program has been very successful on several levels. Local partnerships and relationships have been developed, the cost is low (\$17,000 in 2004), 400 stoves have been replaced in five years, and it is simple, popular, and more easily staffed. Partners with his agency in implementing the rebate program include local stove dealers, the Hearth Association, local recyclers, the regional gas company and media companies. The first step in this rebate program is for a consumer, responding to a advertisement he or she has seen, to clean and haul his/her old stove to a recycler, who provides a certificate that the old stove has been destroyed. The consumer then takes this certificate to a dealer who provides an on-the-spot instant rebate when the consumer purchases the new stove. The dealer logs the purchase, and sends an invoice to the agency (YRCAA) that then pays the dealer and the recycler. The rebate amount provided by the agency is \$125 per stove. Dealers contract with the agency to participate, and provide an additional matching rebate of \$125, for a total rebate to the consumer of \$250 per stove. (He noted that Cascade Natural Gas Co. may add an additional \$250 rebate per stove, which would make the total rebate to the consumer \$500. The Propane Association

may also want to participate.) The recycler also signs an agreement with the agency not to use, sell, or give away old stoves. The agency's responsibilities include selling the program to partners, finding funding and managing the budget, handling media relations and advertising, program administration and supervision, and providing ongoing liaison and support for consumers, recyclers, and dealers. This program has many positive results including happy consumers, cleaner/healthier air, increased sales for dealers, less regulation (softer, gentler approach) and fewer complaints. Funding sources for the rebate program include agency fines and penalties, a state tax on woodstove sales, government grants and other agency funding, and heating and fuel industry companies. Other potential applications of a rebate program being considered are the replacement of gas lawnmowers with electric mowers, replacement of gas or propane home appliances with pilot-less models, diesel retrofits, and chipper rebates. In conclusion, Mr. West noted that Washington State's woodstove emission standards are the tightest in the country, and he would like to see these adopted nationally.

Comments and questions following Mr. West's presentation:

• Question: *How much of the population lives on the Yakima reservation?*

Answer: About 10 -15 percent of the community live on the reservation.

• Question: *What is the average cost to the consumer and what is the "carrot" to participate?*

Answer: Generally, people must have some disposable income. The low end cost for a certified stove is \$600 to \$700. Most people buy new stoves that are \$1,500 or less.

• Question: *Did you offer an incentive to simply junk old stoves and not replace them?*

Answer: Recyclers are paid \$10 per unit. The program with dealers works so well that only a few people simply junk their stoves without replacing them.

Question: *What messages really motivate consumers?*

Answer: Show old stoves as villains, and new stoves as nicer, prettier, etc. That new stoves are more efficient and save fuel is also a motivator.

Comment: *Research by John Gulland identified efficiency (e.g., having to cut less wood) as the number one reason people changeout their old woodstoves. Safety was also high on the list as a reason. Also, marketing of stoves by manufacturers is most dependent on looks.. "like a piece of furniture is the room."*

Woodstove Changeout Programs - What research has EPA done about funding?
presented by Karen Blanchard, EPA/OAQPS

Ms. Blanchard presented an overview of ideas for sources of funding developed thus far for changeout programs. These include Supplemental Environmental Projects (SEPs), foundations, big businesses, demonstration grants, rebates/discounts, tax credits, and possible new source review (NSR) offsets. SEPs are undertaken in the settlement of an enforcement

action, with funding coming from the violator. There must be a relationship to the violation (e.g., SEP could be in the same area where the violation occurred). While Ms. Blanchard noted that there are some limitations on the use of SEP money (e.g., cannot use in locations where EPA has a demonstration grant, and a third party organization is needed to administer the program), the future looks good for SEPs to fund woodstove changeouts, and internal marketing is underway within EPA to promote this idea. Ms. Blanchard also discussed the results of EPA's initial research into foundations as a possible source of funds to purchase clean stoves/appliances for low income people. This idea seems consistent with the mission of a number of foundations and may appeal to some. She added that most foundations make decisions on an annual basis, and that a grant application needs to come from a non-government organization (although its not clear whether or not State/local/tribal organizations could apply.)

VI. Summary of Results of Breakout Session

Following the formal presentations, meeting participants divided into small groups to brainstorm ideas for changeout programs. The groups were asked to generate recommendations, identify opportunities and obstacles, and note important things that have been learned. Following this breakout session, meeting participants reconvened into a plenary session, and a representative from each group reported the results of his or her group's brainstorming in each topic area. A compilation of ideas reported by all groups is presented below.

The groups recommended that:

- EPA should continue to quantify the wood smoke problem through measurements and possibly receptor modeling; continue to improve emission inventory data; continue to research emission reductions.
- Efforts should be focused on where there is a problem; understand the source of the problem in your area before undertaking a changeout program; count homes, conduct surveys, etc. to identify number of woodstoves vs. fireplaces; understand the fuels used and fuel costs.
- EPA should serve as a clearinghouse for information, providing "one-stop shopping" source of credible information.
- EPA should serve as the national-level connection between State/local/tribal agencies and HPBA and utility companies.
- Barriers research should be conducted, e.g., obtain energy usage and other information from power companies under Low Income Energy Assistance Program; conduct phone survey and finance with EPA grant, fees, or general fund.
- Understand your partners' potential interests.
- Make sure all your sources are covered.
- Partners should stay connected/informed.
- EPA should provide funds through the Section 105 Grant program.
- There should be a mechanism for tribes to use SEP funds.
- EPA should provide help to communities on ordinances/by-laws (e.g., templates, case studies).
- EPA should work with utility companies to get information inserts on clean woodstoves placed into monthly bills.

- Use social marketing knowledge to target changeout audience.
- EPA should consider whether current technology will allow “hybrid” stoves as the basis for a revised NSPS.
- EPA should move quickly to establish standards for outdoor boilers.
- National dollar minimums should be established for discount and rebate programs.

There are opportunities to:

- Provide improved education/outreach/surveys.
- Look for credible partners (e.g., American Lung Association) to help make people, especially kids, aware of the problem and new technologies to solve the problem.
- Integrate/incorporate this discussion into other national meetings.
- Provide a clearinghouse for information.
- Distinguish artificial vs. real emissions; obtain a definitive answer on toxic compounds in wood smoke.
- Work with HPBA.
- Expand the way we look at the problem; e.g., get utilities more involved and consider social justice perspectives such as the health impacts on low income households.

Existing obstacles are:

- Funding.
- Obtaining “buy-ins” from other parties (politicians, banks, insurance companies, etc.).
- Those who believe it’s a God-given right to burn wood.
- Understanding the target audience.
- Public perception; people don’t believe there’s a problem.
- Opportunities are not always equal in who they reach.
- Rebates are too small.
- How to meet the needs of disadvantage, low income people, who feel they must burn wood.
- Cultural - how to find the right “carrot” to motivate changeouts.
- Low income levels.
- How to dispose of old stoves.

Lessons Learned

- Communication is very important; there is a need for a national clearinghouse of information.
- Funding doesn’t solve everything - “one size doesn’t fit all” potential changeout situations.

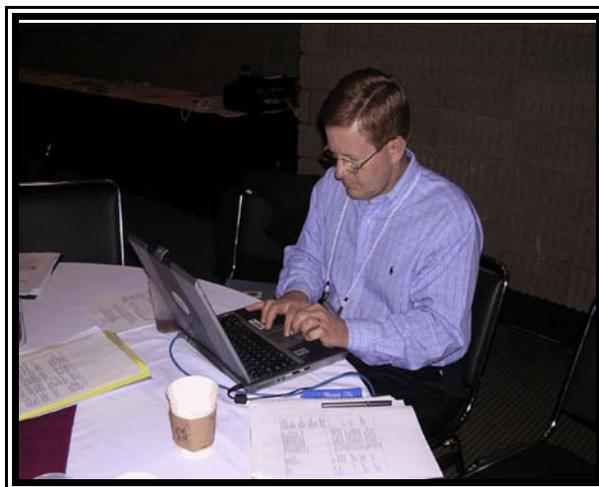
Other Comments/Issues

- There is a significant difference between fireplaces and woodstove usage in urban vs. rural areas.
- What are the emissions associated with manufactured firelogs? Are these truly a better alternative to burning wood?
- Participation in meetings such as this might be increased if EPA provides travel funding assistance.

- Many tribes don't have the technology to participate via WebEx; consider helping them to obtain hardware as an alternative to providing travel assistance.
- Tribes want EPA to take the lead in dealing with utilities, and suggest trying to get gas companies to provide incentives to their customers for changeouts.
- Participants were encouraged to identify opportunities to include this topic (woodstove changeouts) in meetings that have already been scheduled.

VII. Additional Questions and Comments by WebEx Participants

During the workshop, a chat room was established for people participating via WebEx to submit comments and questions to the workshop and to each other. Gil Wood of EPA/OAQPS, moderated the chat room session from a portable computer on-site in Atlanta. He referred questions that arose in the chat room to workshop presenters in Atlanta as time allowed, and answered some questions directly. Questions and comments relevant to changeout programs by chat room participants not reflected previously in this report, and that may be of interest to a wider audience, are extracted from the chat room transcript and presented below.



Gil Wood chats with participants over the internet.

Question: *Would you please post contact information for the Burn Hot, Burn Clean and Burn it Smart program?*

Answer: Maria Dorego (Canada Natural Resources) led Burn-it-smart and Victor Li (Ontario -Environement Canada) helped implement it.

Comment: *In the monitoring aspect of the program in Libby, Montana it might be very useful to also include some type of VOC canister monitoring for other components of the wood smoke emission. This could assist in identifying how much of the reduction is from the stove changeout, and it also might help with quantification of wood combustion impacts of other toxic compounds.*

Response: We are also measuring toxics at Libby and tracers for woodstove emissions.

Question: *The EPA certified stoves last for a duration of how many years?*

Answer: 30-40 or more years.

Comment: *The information and education programs need to deal with outdoor wood and vegetative waste combustion as well. The public needs information on health effect from burning and how to minimize them. The emissions and the health effects from outdoor burning of wood and burning of leaves and brush are very similar to woodstove emissions. Public information doesn't need to be limited to just woodstoves.*

Comment: In the west and for tribes, a gas stove is not economical. Gas stoves cost you the price of gas. But wood is free in the most of the west due to fire danger and beetles infestation. Therefore, free wood versus buying compressed wood or paying for a gas bill is not economical. Time for cutting wood is not a "cost" for many. Also gas is not an option for some tribal communities. Another point is that the dollar amount on the buy-back still misses the economic viability for Tribes and rural America (\$300 off a \$1500 stove is still a big expense). Basically it still is too costly.

Comment: For rural areas, I think we need to develop clear and effective guides for educating and motivating people to operate their existing appliances more efficiently. I think the keys are fuel management and proper combustion mixture to get efficient burning.

Comment: Typical current fuel management for people that leave their woodstove burning all day is to close the damper down, which means that even with a new, certified woodstove emissions will be high. Only a pellet stove can manage fuel (wood) so that the stove burns clean while the home owner is at work.

Comment: In my neck of the woods, fuel management means selecting dry wood of the proper size to ignite quickly and burn thoroughly. The combustion mixture is also important with fuel size, proximity and oxygen supply all critical factors. With the proper load of fuel and controlling both inlet and outlet air dampers, even an old stove can burn efficiently for quite a while - like over night - without too much trouble.

Comment: In Libby, MT according to Ron Anderson, the worst PM-2.5 days are days when the stove are on a slow burn. Not the days that demand the most heat and wood in a cold snap. The stove gets less attention and tends to smolder over a long period of time.

Comment: The middle-aged, air tight stoves cause a lot of this problem. They often are set up without an outlet air damper and only control the rate of burn with oxygen deprivation - which leads to smoldering and excessive creosote buildup.

Comment: Older stoves control the rate of burning with the outlet damper and then balance the inlet air to match the outlet air to get a slow but efficient burn.

Question: Reference the ongoing discussion about outreach/survey, are there sample surveys to assess woodstove/fireplace use?

Answer1 (by a chat participant): For tribes, I know Ben Ware @ Jemez Pueblo, Tony Basabe @ Swinomish Tribe, & Jim Woods @ Makah Tribe, as well as Ryan Callison, Cherokee Nation--may have tribal surveys.

Answer2 (by another chat participant): Fort Collins has a biennial AQ citizen survey that includes questions on wood-burning practices, I'd be happy to share it (and also ID the aspects of the survey that need improvement). A few years ago I heard HPBA had a good compilation of surveys. Would love to see other sample surveys.

Answer3 (in writing this report): Jim Houck of Omni Test, who is consultant to HPBA, has an excellent compilation.

VIII. Additional Comments and Recommendations in Post-Workshop Evaluations

Evaluation forms for the workshop were distributed to both in-person and Webex participants. Additional comments and recommendations pertaining to changeout programs and possible future workshops by those who completed these forms are summarized below.

Generally, evaluation responses indicated participants were very pleased with the workshop. It was noted that useful contacts were made, and it was helpful to see what has been done, and what issues exist, in different areas of the country. One respondent reiterated that EPA should update the NSPS, and develop an NSPS for fireplaces. Also, it was suggested that EPA consider a voluntary Green Stove/Green Fireplace Program like Energy Star. Those who participated via Webex also reported a generally positive experience, with several citing this as an excellent, cost-effective way to broaden participation.

Suggestions were made on improving/enhancing the content of the workshop. These included adding more ideas on what could work to remove the old stoves, presenting more information on funding sources such as SEPs, foundations and possible HUD funding for low-income households, presenting case studies, providing more specific programmatic details and providing guidance in areas like changeout eligibility. A specific concern noted for tribes was learning how tribes could better interact with other stake holders to get farther ahead with changeout programs. Two participants asked that options for addressing residential wood smoke emissions other than voluntary changeouts also be described so state, local, and tribal agencies are aware of the full range of options. It was also suggested that it would have been useful to have a summary report comparing all woodstove changeout programs prior to the meeting, and that this is something to keep in mind for a future meeting. A comment was made that the workshop should have a narrow focus: either on large metropolitan areas or small cities/rural areas that are low income, due to the large differences between these.

Participants thought that additional woodstove changeout workshops should be held. A number of sites were recommended for future workshops including the west, midwest, southeast, New England, pacific northwest and Alaska, Boston, Pennsylvania, Boise, Santa Fe, locations for special groups (e.g., tribal, rural, urban), each EPA region, and sites where changeout programs has been successful. One person suggested picking a gateway community to a Class I area that has existing smoke impacts, such as Jackson Hole or the Grand Canyon, and that tribal linkage to this issue has high potential for added value. A Webex participant indicated that he could assist in hosting a meeting in the Albuquerque area. It was also recommended that other partners/associations be at a future meeting as well as manufacturers and HPBA members, and that a changeout workshop be held at the HPBA conference each year (including next year in Salt Lake City), with presenters also participating in HPBA's continuing education workshops.

In response to a question about what would be the best forum for future workshops, the HPBA annual meeting was mentioned by several people. Including HPBA in any large scale workshop was emphasized, if terms of a public/private partnership were going to be discussed or

negotiated. Workshops at/with STAPPA/ALAPCO¹, and regional planning organizations such WESTAR², NESCAUM³, MARAMA⁴, and the WRAP⁵ were also suggested as possible forums. Possibilities may also exist with the Institute of Tribal Environmental Professionals or the National Tribal Environmental Council (NTEC). A meeting in Santa Fe could bring many of these groups together. A Webex participant indicated that an opportunity may exist to get NTEC to add this topic to their agenda for a national conference in May at Oneida Nation in Wisconsin. Some suggested increasing Webex participation at future meetings, and having hands-on workshop sessions. One person suggested that one day was not enough time for the workshop.

Several recommendations were made for further communications about wood smoke, woodstoves, and woodstove changeouts. These included recommending that EPA send E-mails directing people to informative new web sites as they are identified and are available, and communicating with potential workshop participants well in advance of the next HPBA meeting. One person said that it will be helpful to have information on states that implement a changeout program and on all aspects of the implementation - i.e. demographics of community; resources, including funding; what worked, what didn't. Including survey examples and other materials used would also be helpful.

¹ The State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials

² Western States Air Resources Council

³ Northeast States for Coordinated Air Use Management

⁴ Mid-Atlantic Regional Air Management Association

⁵ Western Regional Air Partnership

Attachment A
Workshop Agenda

Agenda for East-West Woodstove Changeout Workshop
 February 24, 2005 10:30 am – 5:30 pm &
 February 25, 2005 8:30 am – 1:00 pm
 Atlanta, GA at HPBA Expo
 Georgia World Congress Center

Participants will learn about and share their suggestions on the following:

- The extent and magnitude of the residential woodsmoke problem
- Mechanisms for addressing the problem, particularly implementation of a woodstove changeout campaign, and
- EPA's plans for supporting states, locals, tribes, and others

Thur., February, 24; Room C109

Time	Topic	What	Who
10:30 – 10:50 am (20 min)	Introductions and welcome	Participants provide name, agency, what they need from the meeting, what success would be for them	John Hornback, Executive Director, Metro4/SESARM Carol Kemker, Deputy Director, Air, Pesticides, and Toxics Management Division, EPA Reg. 4
10:50 – 11:10 am (20 min)	Introduction to woodsmoke initiative	Basic information on overall woodsmoke initiative including draft EPA products, e.g., SIP guidance, woodstove changeout "how to" manual, website	Karen Blanchard, EPA OAQPS
11:10 – 11:30 am (20 min)	Nature and magnitude of the woodsmoke problem	What are the emissions? What are the health effects? What monitoring info is available? What are the number and location of woodstoves? What do they look like?	Larry Brockman, EPA OAQPS
11:30 – 11:45 am (15 min)	Burning questions	Questions on basic information presented	All
11:45 – 1:00 pm (1 hr 15 min)	Lunch		

1:00 – 2:45 pm (1 hr 45 min)	Woodstove changeout program case studies and Qs & As	Highlights and lessons learned from woodstove changeout programs. Speakers will address topics such as: structure of ongoing programs, various funding mechanisms and incentives, pollution prevention, working with rural and urban constituents, overcoming challenges, and potential barriers.	Teresa Lee & Ralph Borrmann, Bay Area Air Quality Management District Jim Nolan, Puget Sound Clean Air Agency Bob West, Yakima Regional Clean Air Authority Karen Blanchard, EPA OAQPS
2:45 – 3:00 pm (15 min)	Break		
3:00 – 3:30 pm (30 min)	Discussion on presentations and funding	Break into groups of 5 or 6 people to discuss the presentations and come up with questions and recommendations to address the needs raised during the introductions.	All
3:30 – 4:30 pm (1 hr)	Small group report out	Small groups present to the whole group their recommendations, questions, challenges, and concerns	All
4:30 – 4:50 pm (20 min)	Burning questions	What's missing? What are important challenges? What else can EPA do? How can you be a resource to each other?	All
4:50 – 5:20 pm (30 min)	Wrap up	- Have your needs been met? - What is your interest in conducting a changeout campaign in your area? - Feedback, evaluation form on the meeting	Karen Blanchard, EPA OAQPS

Fri., February 25; Room C109

Time	Topic	What	Who
8:00 – 9:00 am	Continental Breakfast*, Welcome and Overview Presentation	We all meet and breakfast together. Welcome from Hearth Association Brief Overview of what we will see on the EXPO floor	Carter Keithley, President, HPBA John Crouch, HPBA
9:00 – 11:30 am	Tour the EXPO Floor	We will break up in groups of 5-6 people and HPBA representatives will provide a “Guided” tour of the EXPO floor. We will view a whole range of hearth products: <ul style="list-style-type: none"> - EPA Certified Woodstoves - Woodstove fireplace inserts - Gas stoves - Gas logs (vented & unvented) - Pellet stoves 	<u>Tour Guides</u> John Crouch Erika Schmidt Rick Dungy Ben Myren Jack Goldman Elizabeth Odina Robert Ferguson
11:30 – 1:00 pm	Lunch* and Speaker	Groups meet back for lunch with Hearth Industry leaders. EPA’s Senior Manager to provide his perspective on supporting and growing woodstove changeouts nationally. Feedback, evaluation form on the meeting	Greg Green, Deputy Office Director, EPA OAQPS
1:00 pm	Official end of Program.	Participants can <u>feel free to check out the EXPO</u> on their own or meet informally with some of the EPA staff who will be around in the afternoon.	

* Breakfast and lunch provided by the Hearth, Patio and Barbecue Association.

Attachment B

List of Attendees

Attendees for East-West Woodstove Changeout Workshop

Feb. 24 & 25, 2005 Atlanta Georgia

Name and Title	Organization	Mailing Address	Contact Information
Amy Fowler	Puget Sound Clean Air Agency	Puget Sound Clean Air Agency 110 Union Street, Suite 500 Seattle, WA 98101	amyf@pscleanair.org, 206-689-4017 (voice) 800-552-3565 (toll-free in WA) 206-343-7522 (fax)
Amy Royden-Bloom	STAPPA-ALAPCO		Aroyden-bloom@4cleanair.org
Deborah Rapp Administrative Secretary	Washoe Co. Reno, NV	Air Quality Management Division 101 Buford Street, Suite 331 Reno, NV 89502-1640	(775) 794-7200 Fax: (775) 794-1222 DRapp@washoecounty.us
Bob Colby, Director	Chattanooga-Hamilton County Air Pollution Control Bureau	6125 Preservation Drive, Chattanooga, TN 37416-3638	(423) 643-5999, Colby_bob@mail.chattanooga.gov
Bob West aka Burn Barrel Bob Air Quality Specialist	Yakima Regional Clean Air Authority, WA	6S 2nd St Suite 1016 Yakima WA 98901	bob@yrcaa.org, 509-834-2050 xt 112
Brian J. Hug Planner	Air Quality Policy and Planning Division Maryland Department of the Environment	Air and Radiation Management Administration 1800 Washington Boulevard, STE 730 Baltimore, Maryland 21230-1720	410-537-4125, bhug@mde.state.md.us
Bruno Maier, Supervisor, Monitoring and Analysis Unit	Regional Air Pollution Control Agency	117 S. Main St., Dayton, OH 45422	maierbe@rapca.org, 937-225-4795.
Carmen McIntyre Environment & Natural Resource Manager	Eastern Band Of Cherokee Nation	Eastern Band Of Cherokee Nation Environmental & Natural Resource Department PO BOX 455, Cherokee N.C. 28719	carmmcin@nc-cherokee.com 828-497-1902
Carol Kemker Deputy Director	Air, Pesticides, and Toxics Management Division, EPA Reg. 4		(404) 562-8975 kemker.carol@epa.gov
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Chebryll C. Edwards Environmental Justice Coordinator	USEPA/OAQPS	USEPA/OAR/Office of Air Quality Planning & Standards Mailcode C304-03 (ITPID) RTP, NC 27711	Phone: (919) 541-5428 FAX: (919) 541-4028 Edwards.Chebryll@EPA.gov
Dr. Daniel Cohan Environmental Specialist	Georgia Environmental Protection Division	Atlanta Trade Port Suite 120 4244 International Parkway Atlanta, Ga 30354	(404) 362-4569 dan_cohan@dnr.state.ga.us

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Greg Green, Deputy Director, EPA Office of Air Quality Planning & Standards	EPA RTP	US EPA, OAQPS, 4930 Page Road, Durham, NC 27703	919.541.5504, green.gregory@epa.gov
Heidi Hales Air Toxics Coordinator	Vermont Air Pollution Control Division	103 South Main Street, Building 3 South Waterbury, VT 05671	(802) 241-3848 heidi.hales@anr.state.vt.us
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James (Jim) Nolan (Executive) Director, Compliance	Puget Sound Clean Air Agency	110 Union St., Suite 500 Seattle, WA 98101-2038	(206) 689-4053, jjimn@pscianair.org
Jason Webb Environmental Reg. Specialist	Eastern Band of Cherokee Indians	Environmental and Natural Resources Office P.O. Box 455 Cherokee, NC 28719	JASOWEBB@nc-cherokee.com cherokee.com
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John Hornback, Executive Director	Metro 4/SESARM	526 Forest Pkwy Ste F, Forest Park GA 30297-6140	404-361-4000 (voice), 770-605-3059 (cell), 404-361-2411 (fax) hornback@metro4-sesarm.org
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Karen Blanchard, Chief, Program Implementation and Review Group	EPA RTP	US EPA, OAQPS, 4930 Page Road, Durham, NC 27703	blanchard.karen@epa.gov, 919.541.5503
Larry Brockman, Residential Wood Smoke, Team Leader	EPA RTP	US EPA, OAQPS, 4930 Page Road, Durham, NC 27703	brockman.larry@epa.gov, 919.541.5398
Libby Faulk Particulate Matter Program Coordinator	U.S. EPA, Region VIII, Air & Radiation Program	999 18th Street, Ste. 300 (8P- AR), Denver, Colorado 80202-2466	faulk.libby@epa.gov 303.312.6083
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Milli Hayman Environmental Specialist	North Carolina Division of Air Quality	1641 Mail Service Center Raleigh, NC 27699-1641	(919) 715-6267 ph (919) 715-7476 fax milli.hayman@ncmail.net
Paul Wagner	Air Toxics Assessment and Implementation Section US EPA Region 4	Atlanta Federal Center, 61 Forsyth St., SW Atlanta, GA 30303	404-562-9100 wagner.paul@epa.gov
Ralph Borrmann (presenter), Public Information Officer	Bay Area Air Quality Management District	939 Ellis Street San Francisco, CA 94109	(415) 749-4791, rborrmann@baaqmd.gov
Ron Anderson Director	Lincoln County Environmental Health Dept.	418 Mineral Ave. Libby, MT 59923	lcdeh@libby.org; 406-293-7781 ext. #228
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Teresa Galvin Lee (presenter), Director of Public Information and Outreach	Bay Area Air Quality Management District	939 Ellis Street, San Francisco, CA 94109	(415) 749-4905, tlee@baaqmd.gov
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Victor Li, Project Engineer	Environment Canada, Toxics Reduction Section	4905 Dufferin Street Downsview, ON M3H 5T4	Phone: (416)739-5801, Fax: (416)739-4342, Victor.Li@ec.gc.ca

Attachment C

Slides Used by Presenters



Voluntary Residential Wood Smoke Reductions Initiative

February 24, 2005

Karen Blanchard
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1

What Am I Going To Cover?

- Outline EPA's Residential Wood Smoke Reduction Initiative
- Ask for Your Feedback—Concerns? Comments? Suggestions?

2

What Is EPA's Voluntary Residential Wood Smoke Reduction Initiative?

Major components

- Changing Out Old Woodstoves/Fireplace Inserts (Main focus)
- "Burn Clean" National Education and Outreach Campaign
- Supporting & Developing Standards (voluntary and/or regulatory) for Fireplaces, Woodstoves and Outdoor Wood Boilers

3

Woodstove Change-outs: Opportunity

- 8-9 million old woodstoves in use
- Cleaner burning, more efficient technologies available
- Can measure the benefits and cost effective

Particulate emissions in one hour:



Old

New

4

Woodstove Change-outs: Challenges

- Replacement with new "cleaner" alternatives are relatively expensive
~\$1500 - \$3000 per stove (including installation)
- Old woodstoves last 30-40 years, (8-9 million)
- Replacing old woodstoves is not amenable to a regulatory program...need creative/innovative approaches
- Many people whose primary heat source is wood cannot afford new stoves even after a discount or rebate

5

Woodstove Change-out Campaigns

- Pilot Projects—Demonstration grants
- "How to" Document—Lessons learned
- Support to those interested in beginning a change-out campaign
 - Public education materials
 - Ready to go media outreach materials
- Guidance for quantifying emission reductions for SIP credits

6

Woodstove Change-outs: Where Are The Pilots?

Pilot Woodstove/Fireplace Insert Changeout Campaign

- Libby, MT (Fall 05)
- Greater Pittsburgh/SW PA area (Fall 05)
- Dayton, Ohio ?
- FY 06: 3-6 change-out locations if funding becomes available
- FY 07 and beyond: Grow into National Program?

7

Goals For Pilots

- Gather insight on tools/information needed to help States/locals/Tribes implement future changeouts
- Demonstrate that voluntary changeout campaigns are cost effective, doable and there are supportive partners
- Demonstrate measurable emission reductions
- Have major media kick off event with EPA Administrator, State leaders, industry leaders, and others to generate interest and media splash
- Document pilot successes and "lessons learned" and develop template

8

Implementing And Supporting Change-outs Through Pilots

- **EPA Demonstration Grants (FY 05-06):**
 - Funds to purchase cleaner stoves for low income people for a few locations
 - Grant winner: needs to show ability to leverage additional resources

Keys to success

- Build strong partnerships
- Leverage resources to provide funding for low income people to purchase stoves/appliances
- Conduct effective marketing and outreach

Why? Marketing before and after changeout

Show benefits, results and market them

9

Expanding The Number Of Change-outs And Supporting New Efforts

- **Settlement Agreement Funds:**
 - Market woodstove changeout as a cost effective tool for addressing PM_{2.5} and toxics emissions to address PM₁₀ and toxics emissions
 - Caution: Can not use settlement \$ in locations where EPA is funding an existing "Program" or "Project"
 - SEP funds may appear suddenly
 - Internal "marketing" efforts are paying off: \$125,000 set aside in Seattle EPA Region 10 as part of settlement agreement

10

Growing The Initiative: Implementing And Supporting Changeouts

EPA Woodstove Changeout Grant Program?: (FY 08)

- **Pros:** can focus grant \$ in areas of greatest need, can plan more effectively
- **Cons:** once we have a grant program we can no longer use settlement agreement funds (e.g., School Bus Diesel Retrofit Program)

11

Residential Wood Smoke Reduction Initiative -- What About The Other Components?

Other components include:

- National Education and Outreach Campaign
- Draft woodstove/fireplace website developed
- Voluntary Fireplaces Consensus Standard and National Building Code?
- Voluntary Consensus Outdoor Wood-fired Hydronic Heaters Standard?
- Considering a revision to NSPS for cleaner woodstoves and outdoor wood heaters

12

What About The Other Components?

- National Education and Outreach Campaign
 - Will tell the public about the health concerns and how to reduce exposures
- Ready-to-go Media Outreach Package
 - Fact sheets, Brochures, FAQs, PSAs
 - Distribute to S/L/T and media
 - For use during wood burning seasons
 - For pre/post storm news

13



What About Outdoor Wood Boilers?

- Examination underway of magnitude of emissions from outdoor wood boilers
- Strategy for how to address these will depend on the results of the review
- ASTM Committee
 - Developing consensus test method
 - Would allow for consensus emission standard
- Several states and NESCAUM asked EPA to issue regulations....NSPS

14

What About Fireplaces?

- ASTM committee
 - Developing consensus test method
 - Would allow development of a consensus emission standard
 - Possible model building code?
- Research
 - Proposal to research possible dioxin emissions from manufactured logs?

15

What About The Woodstove NSPS?

- Important to STAPPA/ALAPCO that EPA revise the NSPS
 - To ensure stoves changed out are clean
 - To update the 1988 standard to reflect state of the art
- EPA acknowledges that the NSPS is out of date—it will be revised
 - Court ordered deadlines and other projects will affect the schedule
 - Washington State standard is being met by most stoves in the meantime

17

Considerations

- Should we advocate for gas over wood?
- Would a revised NSPS actually get reductions?
- What if the grant funds do not get leveraged?
- What if no SEP funds become available?
- Other?

18



Summary/Feedback

- There is a great deal of energy and support inside and outside EPA.
- There are many facets and opportunities to the initiative.
- We want your comments, concerns, suggestions, support.
- We want to work with you.



Woodstove Changeout Workshop

Nature and Magnitude of the Problem

February 24, 2005

Larry Brockman
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1

Nature and Magnitude of Residential Wood Smoke

Presentation Purpose

- Provide overview of the following:
 - Potential health effects
 - PM 2.5 emission inventory information
 - PM 2.5 source apportionment information
 - HAPs information

2

What's in wood smoke?

- Benzene
- Toluene
- Formaldehyde
- Polycyclic organic matter
- CO, NOx, and SOx

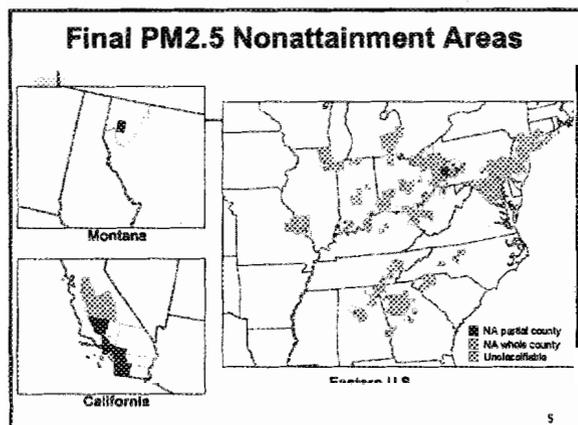
3

Residential Wood Smoke - Why do we care?

In 1997, EPA estimated that meeting the fine particle standards will prevent at least:

- 15,000 premature deaths;
- 75,000 cases of chronic bronchitis;
- 10,000 hospital admissions for respiratory and cardiovascular diseases;
- 20,000 cases of acute bronchitis;
- hundreds of thousands of occurrences of aggravated asthma; and
- 3.1 million days when people miss work because they are suffering from particle-related symptoms.

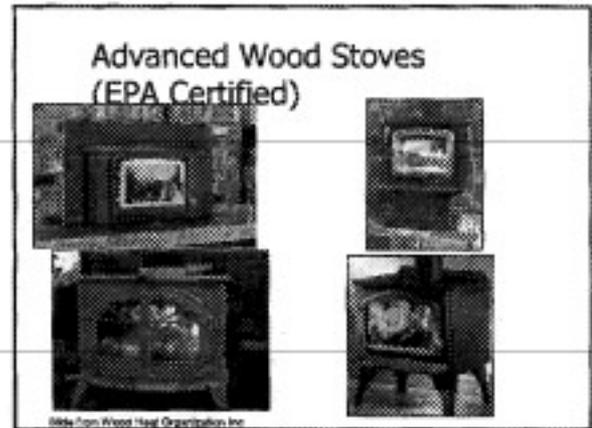
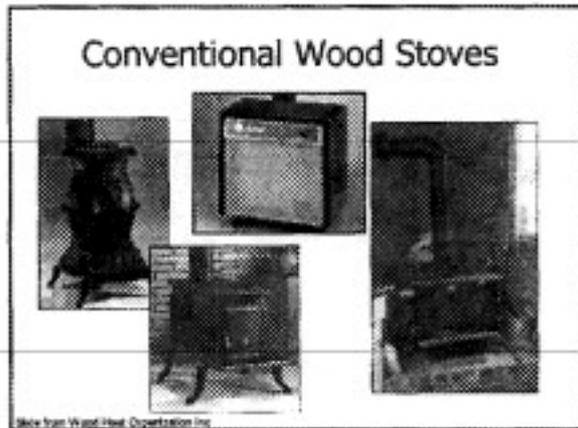
4



A Large Quantity of Emissions Distributed Over a Large Geographic Area

- Fine particle pollution (PM2.5)** - ~6 % (420,000 tons) of total PM2.5 direct emissions
- 40-45 million wood burning appliances in U.S.
 - 15 million of those are wood stoves, either free standing or fireplace inserts
- 80% - 90% are pre-NSPS (prior to 1988)

6



How many old stoves are in my locality?

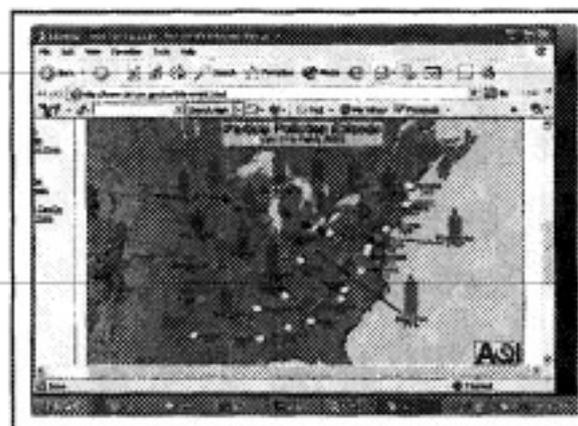
- Not easy to say
- U.S. Census Data – American Housing Survey
- Market Research Firms
- State, local, tribal and other surveys

9

Potential for Local Exposures/Non-Attainment

- Occurs where people live
- Short "stacks"; poor dispersion
- Exposure may be higher per ton than from industrial sources
- Short term PM_{2.5} peak exposures are a concern in some areas
- Over 40 communities have burn bans

10



PM Source Apportionment Monitoring Data

- In East, "biomass" burning is 0.3 - about 2 ug/m³
- Biomass includes wildfires and prescribed fires in addition to residential. Amount that is residential wood is uncertain
- More research is needed

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Reliability of Emissions Inventories and Projections

- The National Emission Inventory (NEI) is a mix of federally estimated data and state data
- The federal NEI estimates for RWC are derived from an estimate of wood consumed in the residential sector at the national level from the Department of Energy's Energy Information Administration (DOE/EIA)
- Estimates are more reliable at higher levels of aggregation than at the county level or lower

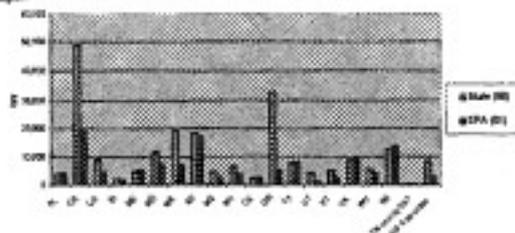
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1999 PM_{2.5} Primary Emissions from Residential Wood Combustion



14

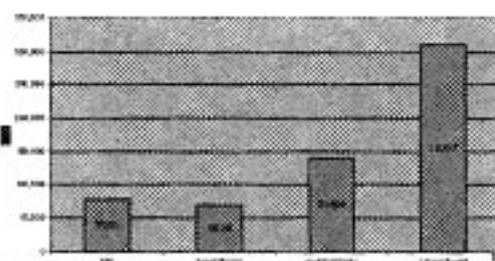
EPA and State PM_{2.5} Emission Inventory Estimates for Residential Wood Smoke



15

2004 MARAMA and NESCAUM Residential Wood Smoke Emission Estimates

PM_{2.5} Emissions from MARAMA & NESCAUM's Residential Wood Combustion Survey



16

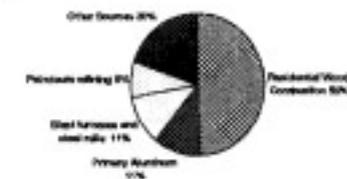
Residential Wood Smoke Why else do we care?

- **Toxics – Polycyclic Aromatic Hydrocarbons**
 - Contributes ~ 22% of all 7 carcinogenic PAHs, e.g., benzo(a)pyrene
- **Indoor Air**
 - Old wood stoves are often poorly sealed
 - Improper ventilation of woodstoves and fireplaces
 - Also, what's outside often comes inside via HVAC
- **Fire Safety**
 - Creosote build-up in chimney from old stoves is faster

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Attachment F

% of Total Benzo(a) Pyrene (BaP) Emissions in Great Lakes Area ~ 21,000 lbs. 1999 Data



■ Residential Wood Combustion ■ Primary Activities □ Steel Refractories and steel mills
□ Petroleum Refining ■ Other Sources

• 1999 Great Lakes Toxics Inventory

18

Conclusion

- Residential wood smoke emissions are potentially a significant source of PM and toxics in numerous areas
- Questions/comments?

Larry Brockman, brockman.larry@epa.gov
919-541-5385



Bay Area Woodstove Changeout Program

A joint effort of the Bay Area Air Quality Management District and the nine local air quality districts



Local Authority

- 1955 - 2005
- 9 counties, 6000 sq. miles
- Seven million people



Wintertime Particulate Strategy

- Health effects of wood smoke
- Particulate strategy
 - "Spare the Air Tonight"
 - Model Ordinance
 - Woodstove Rebate Program



Health Effects of Wood Smoke

- Smoke Contains Toxic Pollutants
 - CO - carbon monoxide
 - NO₂ - nitrogen dioxide
 - VOCs - volatile organic compounds
 - PM - particulate matter
 - Formaldehyde
- Air Pollution Increases with Population



Particulate Strategy 1. Spare the Air Tonight!

- Issued when PM_{2.5} readings are expected to exceed 150 AQI
- Ask residents to drive less and not to burn
- Wood burning produces about 30% of the particulate pollution on a typical winter night



Particulate Strategy 2. Model Woodstove Ordinance

- A guidance document for cities and counties
- Does not ban wood burning in fireplaces
- Air Quality Benefits of the Model Ordinance
 - An ordinance that prohibits sale of new wood stoves that do not meet the new particulate matter standards is a feasible, cost-effective measure.
 - For 1,000 new homes, elimination of PM_{2.5} air quality non-attainment would:
 - Eliminate 1.7 million pounds of wood smoke from the Bay Area.
 - Allow for new green space, improved air quality of life.
 - As of February 2015, 26 local air quality districts have adopted the Model Ordinance.

Particulate Strategy

3. Woodsmoke Rebate Program

- Modeled on the Great Stove Changeout and Three Mountain Power Project in Burney, CA
- California Energy Commission directed PM-10 emission mitigation for power plant projects
- First large urban rebate program
- 100% voluntary, cash incentive
- Power Plant sponsors, Air District administrators
- Real emission reduction targets

Ways to Organize

- Retail incentive- (Great Stove Changeout)**
 - Rebate given by retailer off purchase price
 - Retailer is the main point of information
 - Advertising through utility bill inserts or retailer
- Direct rebate- (Energy efficiency programs)**
 - Rebate sent direct to consumer
 - Advertiser is the main contact for information
 - Advertising through paid advertising campaign
 - Area 910, 940, 95, 96 administration

Calpine Program Coordination

First Program

- CEC mandates
- 2002 registered retailer agreements
- Limited geographical area
- Rebate amounts & eligibility requirements
 - Direct payment of payment for application and burning
- Numbered voucher
- PR and advertising
 - Marketing, advertising, public awareness campaign by local utility, business, media, radio, TV, etc.

Mitigation Calculations

Category	Quantity	Unit	Value
Stoves	100	Stove	100
Fireplaces	200	Fireplace	200
Other	50	Other	50
Total	350		350

Challenges to Success

- Planning assumptions of stoves vs. fireplaces
- Limited geographic area
- Local network vs. traditional marketing
- Dealer network
- High rebate amounts
- Administrative costs

Silicon Valley Power Program

Second Program

- Overlapping programs
- 1300 since inception, 550 rebates since summer
- Changes
 - Reduced rebate amount
 - Eliminated the secondary voucher
 - Can only buy one rebate May-July
 - Direct rebate program, 4000, 910, 940, 95, 96
 - Ability to change against the program, 4000, 910, 940, 95, 96

Current Challenges

- Where does it pay the most?
 - Rebate dollars should be in proportion to their mitigation values?
 - Too much time spent with fireplace conversions
 - High costs of advertising. Partner with PG&E?
 - Limited geographic area. Making it Bay Area wide.

SANTA CLARA COUNTY WILDFIRE SMOKE MITIGATION APPLICATION

SMOKE MITIGATION APPLICATION

1. I hereby certify that I am the owner of the property described in this application.
2. I hereby certify that I am the owner of the property described in this application.
3. I hereby certify that I am the owner of the property described in this application.
4. I hereby certify that I am the owner of the property described in this application.
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Recycling Receipt

RODRO WOODSMOKE REBATE RECYCLING RECEIPT

Please attach this original receipt to the completed application when applying for the Rebate. Keep a copy for your records. This receipt is necessary to qualify for the Rebate. See attached document for details. This receipt is valid for 90 days from the date of issuance.

Name: _____

Address: _____

City: _____ State: _____

Phone: _____

Signature: _____

Date: _____

Switch from burning Wood to Using Gas

Switch from burning wood to using gas. Save money and reduce your carbon footprint. Gas is cleaner, safer, and more convenient than wood. It's the smart choice for your home.

For more information, visit www.sccrecycling.com

\$300 to \$500

For more information, visit www.sccrecycling.com



SoCalGas Utility Rebate Program An Alternative Approach

- Hands off approach
- Sold from an energy efficiency perspective
- Utilities have declining use per meter, losing market share
- Leveraged by utility manufacturers, retailers, and the utility
- Win-win. Everyone gets something out of the process
- Gov's office and NRDC stress reducing energy use. Program discontinued
- Future implementation based on teaming up with local air quality agency



SoCalGas Rebate Program 1. "Fireside Living" Gas Logs

- Winter program, started in 1997
- Promotes decorative gas logs as a clean, convenient alternative to wood burning
- Participants
 - 159 specialty dealers
 - 7 manufacturers / distributors
- Key Elements
 - \$11 rebate to eligible family homes
 - \$25 coupons, sponsored by manufacturers / dealers
 - \$5 processing fee owed by SCG
 - Dealer co-op ads (50%, \$2,000 max per dealer)
 - Direct Mail to select homes with gas stoves
 - Dealer locator support through DMR and web site



SoCalGas Rebate Program 2. "Fireside Living" Stoves

- Started in 1998, a fall program
- Promotes awareness of natural gas fireplaces and freestanding stoves, and their efficiency and zone heating benefits
- Participants
 - 65 specialty dealers
 - 4 manufacturers / distributors
- Key Elements
 - \$6 rebate to eligible average gas use homes
 - \$25 coupons from manufacturers / dealers
 - \$25 processing fee to manufacturers, paid by SCG
 - Dealer co-op ads (50%, \$2,000 max per dealer)
 - Direct Mail to select homes with gas stoves
 - Dealer locator support through DMR and web site



Future Modifications ?

- Make the program more widely available
- Air District concentrates on messaging
- Manufacturers & retailers provide the rebate dollars
- Retailers provide customer contact and support
- Provide extra incentive for woodstove recycling
- Team with PG&E



Which way do we go?

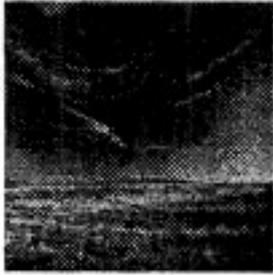


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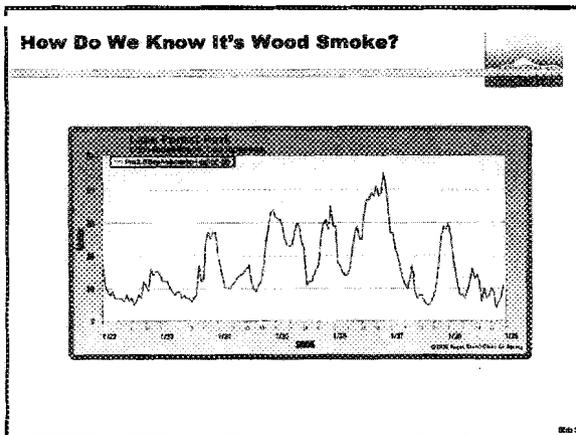
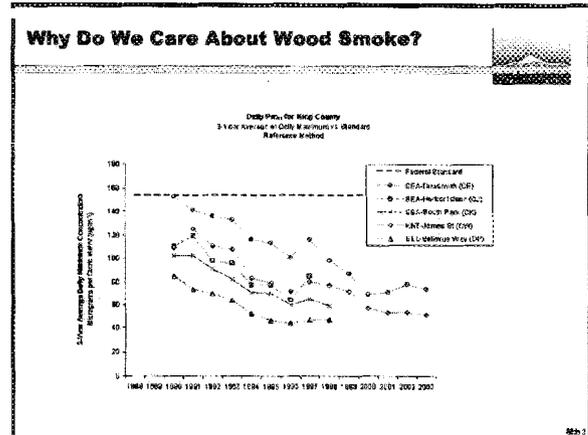


Working Together for Clean Air
www.pscleanair.org



The Puget Sound Wood Smoke Control Program

James Nolan
Director-Compliance



- ### Our Universe of Wood Burning Devices
- 1.2 Million residences in our jurisdiction
 - Over 600,000 fireplaces and woodstoves in use
 - About 500,000 are fireplaces and 100,000 are wood stoves
 - Need to understand what devices are causing the problem
 - Certified stoves are not the answer to problem of wood smoke
 - Certified devices are thousands of times dirtier than gas or oil
 - Central heat is really the answer
 - Like the ambiance of a flame? Get a gas appliance!

- ### What's Our Program
- Change from wood to a cleaner form of heat
 - Natural gas, propane, oil, pellet) or from uncertified to certified
 - Pollution prevention
 - Proper burning practices, weatherization, manufactured logs etc.)
 - Burn Bans
 - Stage 1 – 35 ug/m³ PM_{2.5} - No fireplaces or uncertified Stoves
 - Stage 2 – 60 ug/m³ PM_{2.5} - No wood burning
 - Designed to discourage the use of uncertified stoves
 - Complaint Response
 - Public education about the health effects of wood smoke
 - Discourage installation of wood burning appliances in new multiple unit buildings and single family housing developments

- ### Uncertified Wood Stove Change Out
- Advertising
 - Joint Promos with dealers and utilities
 - Direct promos by Gas Company and Oil Heat Institute
 - Funding – Whers do we get the \$\$\$?
 - State woodstove account
 - Direct agency subsidy
 - ▲ Paid for disposal
 - ▲ Pay a portion of the change out
 - SEP's
 - ▲ Being paid a portion of the cost of their employees changing to gas
 - Permit mitigation (e.g. Rainport)
 - implementation
 - Local programs, home shows, fairs)
 - Those annoying burn bans (if you really want to heat with wood you need to upgrade)

Wood Smoke Pollution Prevention

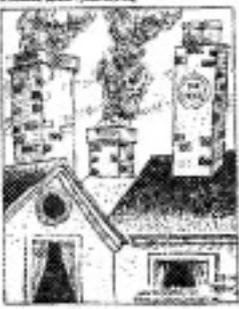
- **Proper Burning practices**
 - Bad burner school - video
 - Heath Products web site (www.burnclean.org)
- **Weatherization**
 - Connect people with existing energy conservation programs
- **Compressed Wood Logs**
 - For open fireplaces this the most realistic option
 - Potential wood smoke emission reduction is over 70%
 - Switching to gas logs would be best, but is relatively expensive
- **EPA Web site has some good references**
 - www.epa.gov/ttn/chiefoff/qa011/related/woodstoves.pdf

What Advice Do We Have

- **PATIENCE** - This is going to take years
- People are in denial - Burning is in our genes
- Be ready for the bad press
 - "A Yuppie Vendetta Against Wood-Stove Owners" - Seattle Times Oct 1991
- Know what the mix of devices is in your region
 - Wood stove change out isn't the answer if the wood smoke is coming from fireplaces
- New wood stoves cost as much as a new forced air furnace
 - It costs in the neighborhood of \$3,000 to install a new wood or gas stove
 - The charge out program will probably not make it economically attractive for folks to change. They need to be ready to eat anyway.
 - We use our burn bans on uncertified devices to encourage them to change
- Manufactured logs are a cost-effective option for open fireplaces
 - There is a huge emission reduction potential for no capital investment
- Focus the message on the wood smoke not the wood burner
 - There is strong political support for wood heating
 - There is no political support for wood smoke

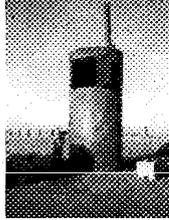
The Ultimate Answer is the Patch

STRANGE SUEB / John Denver



Wood Stove Rebate Program

Presented By: Bob West
aka "Burn Barrel Bob"



Yakima Regional Clean Air Authority

Yakima, Washington Rural, Conservative Community

- South-central Washington
- Desert, 9" precipitation
- **Ag economy**
- Population 222,000
- Largest city 72,000
- Geography and climate lead to pollution-trapping
inversions
- Lotsa trees, few tree huggers



Early Attempts

- Tried "loan" program in early 1990's
 - Full-meal deal, including working with installers
 - Expensive -- \$96k -- 93 stoves
 - Inefficient, years later still trying to collect \$
 - Labor intensive



Rebate Program Works

- Local partnerships, builds relationships
- Low cost--\$17,000 in 2004
- 400 stoves replaced over 5 years
- More easily staffed
- Simple
- Popular

Partners

- YRCAA (Agency)
- Local Stove Dealers
- Hearth Association
- Local Recyclers
- Regional Gas Company
- Media Companies

How It Works

- Consumer sees ad
- Cleans out old stove & hauls to Recycler
- Recycler & consumer complete certificate
- Recycler crunches/recycles old stove
- Consumer takes certificate to Dealer
- Selects and purchases new stove
- Instant rebate
- Dealer logs purchase, sends invoice to Agency w/ certificate
- Agency pays Dealer & Recycler

Budget (2004)

Income		Expenses	
Dealers	\$2,400	Advertising	\$3,400
Hearth Assn	1,000	Agency Salaries	3,900
Woodstove Tax Grant	4,500	Rebate Paid to Dealers	9,000
Fines & Penalties Account	9,000	Recyclers' Fees	800
Total	\$17,000	Total	\$17,000

Behind the Scenes

Dealers

- Contract with Agency to participate
- Match Agency rebate (\$125 per stove)
- Contribute fixed amount of \$\$ for advertising
- Keep records and communicate sales
- Bill Agency for the match

More Behind the Scenes...

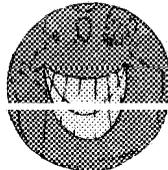
- Recycler
 - Signs agreement with Agency
 - Agrees not to use, sell, or give away old stoves
 - Crunches and recycles old stoves
 - Signs off on Certificate of Destruction
 - Keeps records and bills Agency for fee per stove

• Agency

- Design and sell program to partners
- Find funding
- Supervise program
- Arrange press conferences & media attention
- Manage advertising budget, arrange ads
- Provide ongoing liaison and support for Consumers, Recyclers, and Dealers
- Pay Dealers and Recyclers
- Create & maintain contracts, records, and reports

Results

- Happy Consumer
- Cleaner/Healthier Air
- Increased Sales for Dealers
- Less Regulation/Fewer Complaints
- Softer, gentler approach
Happy Community



Wood Stove Rebate Funding Sources

- Agency fines & penalties
- State tax on wood stove sales
- Other Agency funding sources/government grants
- Private grants
- Heating and fuels industries companies and associations, like the Hearth Association
- Environmental groups

Other Potential Applications

- Replace gas lawnmowers with electric
- Replace gas or propane home appliances with pilot-less models
- Burn barrel turn-in
- Diesel retrofits
- Chipper rebate
- Your ideas???



Woodstove Emission Standards

EPA Grams/hr		Washington State Grams/hr
7.5	Non Catalytic Woodstove	4.5
4.1	Catalytic WoodStove	2.5



Bob@yrcaa.org 509-834-2050 extension 112

Woodstove Change-out Programs

What research has EPA done about funding?
--Karen Blanchard

Ideas for Sources of Funding

- Supplemental Environmental Projects*
- Foundations*
- Big Businesses
- Demonstration Grants
- Rebates/Discounts
- Tax Credits
- NSR Offsets?

Supplemental Environmental Projects

- Undertaken in settlement of an enforcement action
- Must be a nexus with the violation
- Can not use for projects funded by federal loans or grants
- Have been used for change-outs

Supplemental Environmental Projects

- Internal marketing underway
- Difficult to plan--\$ may appear suddenly
- Can not use the funds in locations where EPA has a demonstration grant
- Amounts may be very large
- Need to have an organization, e.g., non-profit, who is willing to administer the program
- Future looks good for future SEPs to fund woodstove change-outs

Foundations

- Researched websites of foundations
 - Idea would be for foundations to fund purchase of clean stoves/appliances for low income people
 - Funding this kind of effort seems consistent with the mission of a number of them
 - Many are location specific, i.e., specific state or area of the country
 - EPA Intern ranked foundations as to the likelihood for success in funding change-outs

Foundations

- Informal discussions with people in the know--
 - Most foundations make decisions on an annual basis
 - Grant application needs to be by a NGO (or a S/L/T?)
 - Idea likely to appeal to some foundations