

WASHINGTON STATE
DEPARTMENT OF
E C O L O G Y

Reducing the Impacts of Wood Smoke from Home Wood Burning Devices

**Wood Smoke Work Group Report to the Governor and
Legislature, as required by Substitute House Bill 2261 (2007)**

Published by the Department of Ecology
for the Wood Smoke Work Group

Publication Number: 08-02-002

December 2007

Table of Contents

Executive Summary	ii
SHB 2261 Wood Smoke Work Group Members	v
Introduction	1
Health concerns	1
PM _{2.5} standards	2
PM _{2.5} sources	4
Effects of violating the standards	5
What the work group considered	5
Overview of recommendations for reducing PM _{2.5}	6
Recommendations for immediate action	6
Recommendations for longer-term actions	9
Conclusion	15
Appendices	
Appendix A - Substitute House Bill 2261	16
Appendix B - RCW 70.94.473 Limitations on burning wood for heat (curtailments)	21
Appendix C - RCW 70.94.477 Limitations on use of solid fuel burning devices (as a contingency measure)	22
Appendix D - Strategies considered but not recommended	23
Appendix E - Programs in other areas	25
Appendix F - Curtailment proposal	26

Executive summary

In 2007, the Legislature passed Substitute House Bill 2261, referred to in this report as the wood smoke study bill. The bill recognizes that:

- the U.S. Environmental Protection Agency recently lowered its 24-hour ambient air quality standard for fine particulate matter (PM_{2.5}) by 46 percent;
- some communities in the state are exceeding or near to exceeding this new limit; and
- high levels of PM_{2.5} are a serious health risk, especially for children, the elderly and those with impaired health.

The Legislature directed Ecology to convene a work group to recommend “practical and cost-effective” measures to reduce effects of wood smoke. This report provides recommendations to the Governor and the Legislature.

Ecology data shows that:

- PM_{2.5} levels are very high in at least 14 communities (see Figure 2 on page 3). In Tacoma and Yakima, these levels violate the federal health standards. Monitoring trends indicate that several more communities could violate the standards in the next few years.
- Wood smoke is the main source of the high levels of PM_{2.5}. It makes up 56 percent of Washington’s wintertime PM_{2.5}.

Old, highly polluting “uncertified” wood stoves and inserts not meeting Environmental Protection Agency (EPA) and Washington standards cause most of the winter wood smoke pollution. Emissions from fireplaces also contribute to the problem.

The work group worked hard, meeting eight times in six months, to identify and evaluate numerous strategies for reducing the impact of wood smoke. The work group recommends three of these strategies be implemented immediately. Ecology will keep working with members of the work group to further develop additional long-term strategies.

The strategies fit into four main categories:

- Update curtailment laws: Update the existing but outdated laws allowing air quality agencies to restrict or ban use of wood burning devices during weather conditions that cause pollution to rapidly rise to unhealthy levels.
- Provide funding for change-out programs: Substantially increase funding to help citizens change out older, highly polluting wood burning devices for newer, cleaner ones.
- Provide funding for a public education/information campaign: Fund a significant public education and information campaign about the health effects of wood smoke and the importance of changing-out old devices, complying with

curtailments, and burning properly. This includes financial support for program implementation and compliance activities.

- Allow area-wide bans or phase-outs of uncertified devices: Broaden existing authority for agencies to limit the use of uncertified devices in at-risk communities. The authority would be used where curtailments and change-out programs may not be sufficient to prevent violations of federal air quality standards.

Immediate needs

The work group proposes three recommendations for immediate consideration:

- An update to laws for calling curtailments.
- Additional funding of financial incentive programs for the change-out of uncertified wood burning devices during the current biennium.
- A law requiring people selling their homes to disclose the presence of an uncertified stove, insert or other device.

The hearth products industry plans to introduce legislation to update curtailment laws. The real estate industry plans to introduce legislation to revise disclosure requirements for home sellers. The additional funding for change-out programs was recommended by Ecology, but did not make it into the Governor's final supplementary budget for the 07-09 biennium.

Longer-term needs

Ecology plans to keep working with members of the work group to further develop additional long-term strategies, including:

- A long-term change-out program to reduce the large number of uncertified devices.
- A public education/information campaign.
- Other implementation and compliance policies and activities.

The reason for these proposals

In many areas of Washington, pollution from wood smoke is causing significant health effects. These effects include increased incidence of asthma and other lung diseases, heart attacks, and strokes. The work group's recommendations for immediate action are critically important to protecting public health and minimizing the number of communities that violate federal air quality standards. Longer-term recommendations are also very important, but need further development.

Health effects also have an economic cost for things such as emergency room and doctor visits as well as missed work and school days. Failing to take action now will result in additional communities having violations of federal air quality standards from wood

smoke that can bring a designation of nonattainment by EPA. When EPA designates an area nonattainment, there can be costly and difficult requirements for local economies, businesses, families, and governments. This designation places additional pollution control costs on existing industries, adds more requirements on new industries, and creates mandatory programs, subject to federal oversight and controls, to address the problem.

The work group's proposals are not inexpensive or easy. They are practical, effective, and essential if Washington is to avoid even higher costs from harmful health effects and federal controls.

SHB 2261 Wood Smoke Work Group Members

Required by SHB 2261	Organization	Member
Dept of Ecology	Air Quality Program	Bob Saunders
Regional Air Quality Agencies	Puget Sound Clean Air Agency Spokane Regional Clean Air Agency Yakima Regional Clean Air Agency	Amy Fowler Bill Dameworth, Dir Charlie Stansel
State Dept of Health	Washington State Department of Health	Judy Bardin, Epidemiologist
Local Health Department	Spokane Health Department	Mike LaScuola
Related Industry: Associations	Independent Business Association Hearth Patio & Barbeque Association NWHBPBA	Gary Smith John Crouch Jerry Fisk
Device retailer	Sutter Home & Hearth	Mike Duval
Non-governmental organization	American Lung Association	David De Bruyn
Additional Members		
Local elected official	Tacoma City Council	Bill Evans
Neighborhood	Community Council of Tacoma	Ginny Eberhardt
Real Estate Industry	Washington REALTORS® and Seattle – King County Association of REALTORS®	Sam Pace
EPA	Region 10	Claudia Vaupel

Introduction

Wood smoke study bill

In the wood smoke study bill, the 2007 Legislature recognized that air quality in some Washington communities is not meeting the recently revised federal air quality 24-hour standard for fine particulate matter (PM_{2.5}). This revision lowered the standard for PM_{2.5} by 46 percent. PM_{2.5} is extremely small particles 2.5 microns or smaller in size. It travels deep into the lungs and stays there, causing serious health effects. The main cause of high PM_{2.5} levels is wood smoke. Current strategies are not reducing wood smoke emissions enough to meet the new federal air quality standards or protect public health. The Legislature recognized that reducing wood smoke emissions would benefit both the state and its people.

In this bill, the Legislature also directed Ecology to convene a work group to:

- Study the effects of wood smoke.
- Recommend to the Governor and Legislature “practical and cost effective” measures to reduce these effects.
- Update the state’s wood smoke control program.

This report describes the work group’s recommendations about what is needed to meet the new federal air quality standards and protect public health in Washington.

General information about wood smoke

Wood heat has been very popular in Washington since the 1970s. After the first oil embargo, the cost of heating oil became too expensive for most people. Since wood is readily available and affordable in Washington, many people added wood burning heaters to their homes to decrease heating costs. Early wood heaters were very low-tech compared to today’s much cleaner burning wood heaters. Because wood heaters have a long life, there are a large number of older, dirtier devices still in use. Wood burning continues to be a popular source of supplemental heat, especially with energy prices currently rising.

Health concerns

Wood smoke is made up of gases and fine particles suspended in the air. It also contains a number of toxic air pollutants. One of the biggest health concerns about wood smoke, indoors or outdoors, is PM_{2.5}. Because PM_{2.5} is very small, it stays in the air a long time and can travel from outdoors to indoors. Therefore, even people who are not burning wood can be exposed to smoke and suffer health effects. Research shows that PM_{2.5} causes both short and long-term health effects, various illnesses, and death. The International Agency for Research on Cancer recently classed wood smoke as a “Category 2A Carcinogen,” meaning it probably causes cancer in humans. Some people are more sensitive to health effects from pollutants based on their age, their health, and their genetic background:

- Infants and children are sensitive to air pollution because their lungs and immune systems are still developing, they breathe more air in proportion to their body weight, and they spend more time outdoors.
- People age 65 and older are sensitive because their bodies are more vulnerable to environmental toxins.
- Those with illnesses such as heart or lung disease, stroke, diabetes, or respiratory infections are also vulnerable.

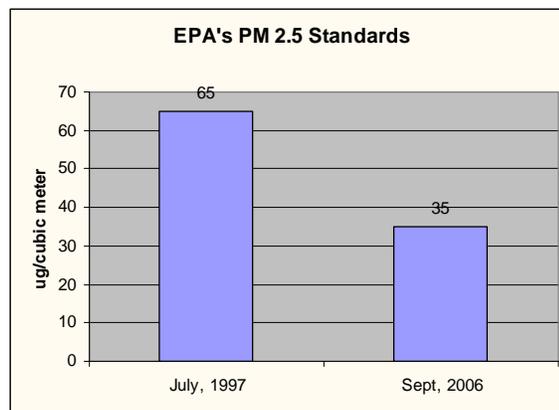
Many Washington citizens are members of one of these sensitive groups or have one or more medical conditions worsened by air pollution.

In response to overwhelming evidence that PM_{2.5} causes serious health effects, EPA lowered the PM_{2.5} air quality standard in 2006 to better protect health. Although EPA's changes lowered the standard by 46 percent (see Figure 1), the standard is still not as low as the medical and public health community recommends. Scientific evidence shows there are serious health effects at levels even lower than the revised standard allows. These health effects are numerous. Those most at risk for health effects are the most vulnerable members of the population: children, the elderly, and people with lung or heart disease.

PM_{2.5} standards

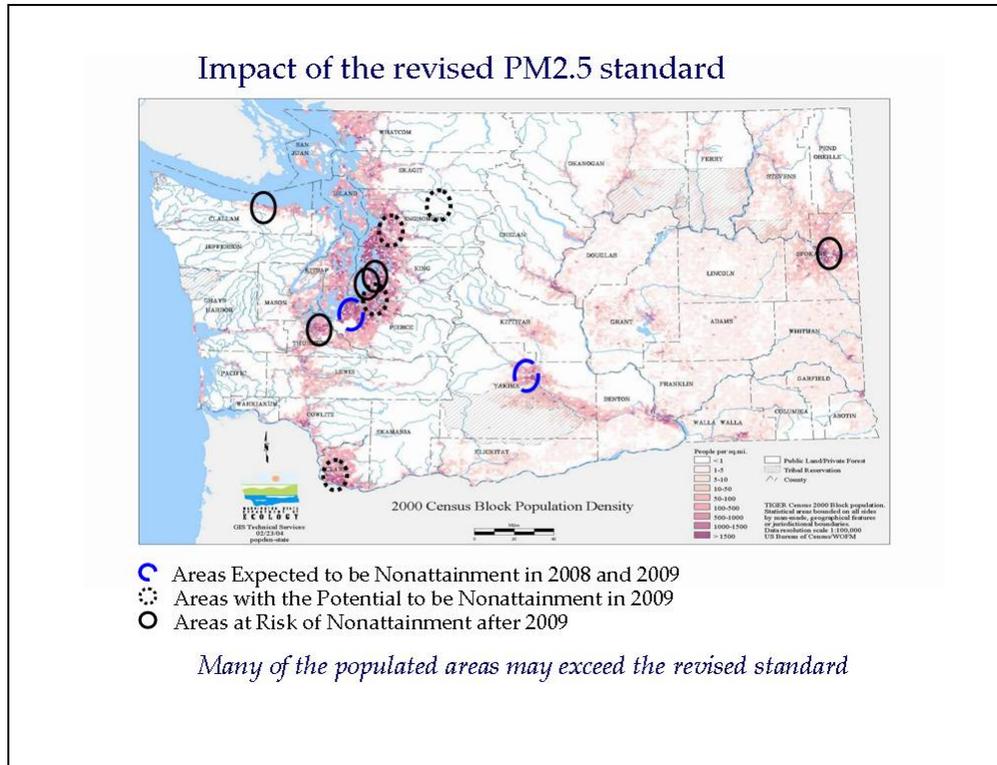
The federal Clean Air Act requires EPA to set air quality standards for certain pollutants that harm public health and the environment. One of the pollutants is PM_{2.5}. In 2006, EPA lowered the PM_{2.5} standard to 35 micrograms per cubic meter of air (ug/cubic meter). See Figure 1 and the section on "Health concerns" above for more information about the PM_{2.5} standard.

Figure 1



When an area violates the standards for a pollutant, EPA designates it as "nonattainment." Tacoma and Yakima have PM_{2.5} levels that violate the new standards. EPA is likely to designate these two areas as nonattainment in 2008 and 2009, respectively. Vancouver, Marysville, and ten other Washington communities are close to violating the PM_{2.5} standard and could become nonattainment in the future (see Figure 2).

Figure 2



Areas Identified as At Risk of Violating the Standards

Areas Expected to be Nonattainment in 2008 and 2009:

- Tacoma area
- Yakima area

Areas with the Potential to be Nonattainment in 2009:

- Vancouver area
- Kent area
- Marysville area
- Everett area
- Darrington area

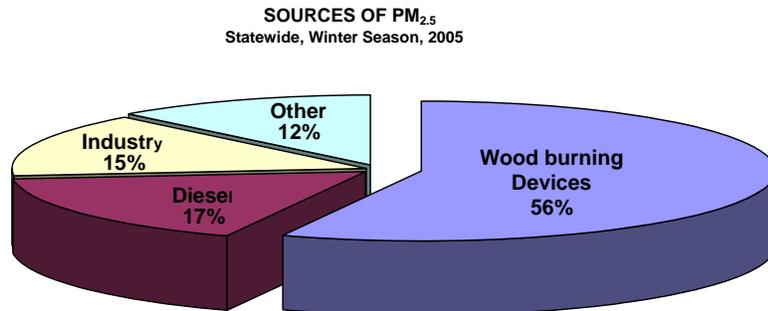
Areas at Risk of Nonattainment after 2009:

- Olympia/ Lacey/Tumwater area
- Port Angeles area
- Spokane area
- Lynnwood area
- Mountlake Terrace area
- Lake Forest Park area
- South Seattle area

PM_{2.5} sources

In winter, more than half (56 percent) of Washington's estimated statewide PM_{2.5} comes from home wood burning devices (see Figure 3). Home wood burning devices include wood stoves, fireplace inserts, pellet stoves, fireplaces, and wood burning furnaces. These devices each have different emission levels. The main difference is that newer devices burn much cleaner than older devices.

Figure 3



Certified, uncertified, and gas/propane devices

By 1990, wood stoves, inserts and pellet stoves had to be certified by EPA, meaning they had to meet EPA emission standards. Oregon also had its own standards. Effective in 1995, Washington adopted even stricter standards than Oregon or EPA. Certified stoves are at least 70 percent cleaner, are 50 percent more efficient, and use one-third less wood than uncertified stoves. Certified stoves also yield more heat per pound of wood burned than older, uncertified stoves.

Because many homeowners don't know how old their devices are, there is uncertainty about the number of uncertified devices in use. Since it is clear that they are the most significant source of wood smoke pollution, many of the work group's recommendations focus on them.

Fireplaces do not currently cause as much pollution as wood stoves because they are used less. However, there are a large number of them, and their continued installation into new homes remains a significant concern.

Although certified stoves are cleaner than uncertified stoves, natural gas or propane-fueled stoves and fireplace inserts are clearly the most efficient and lowest PM_{2.5} emitting devices available.

Emissions from Home Wood Burning Devices

Statewide Wood-Burning Devices:	% of PM _{2.5} emissions	# of devices*
Uncertified Stoves, Inserts (pre-1990)	59%	292,841
Certified** Stoves, inserts, pellets (post-1990)	23%	322,133
Fireplaces	18%	705,985
Total		1,320,959

* from 2001 Ecology survey; other data suggests more uncertified devices than this

Effects of violating the standards

When EPA designates an area nonattainment, there can be costly and difficult requirements for local economies, businesses, families, and governments. Even though Washington's main source of PM_{2.5} is wood burning rather than industry, the federal Clean Air Act requires additional regulation of industries in areas that violate the standard. While these requirements are intended to allow industrial growth without worsening already poor air quality, they are an additional layer of regulation on both new and existing industries.

Requirements for industries that emit large amounts of PM_{2.5} include:

- Existing industries must install at least the minimal levels of emission controls.
- New or expanded industries must install the most stringent level of emission controls. They also need to "offset" their new emissions by (1) reducing their existing emissions or (2) paying for emission controls at other sources.
- Road and highway improvement projects may need to be changed or scaled back if analysis shows they would make PM_{2.5} pollution worse.

Areas of Washington have previously been designated nonattainment. These areas have successfully returned to attainment status through partnerships among regulators, local governments, public health organizations, the hearth industry, business members, and others.

What the work group considered

The wood smoke study bill directed the work group to study five topics:

- Washington communities with high levels of PM_{2.5}.
- The contribution of wood burning devices to high levels of PM_{2.5}.
- Strategies other states, regions, or cities have used to reduce wood smoke pollution, and the effectiveness of these strategies.
- State laws, rules, fees, utility regulations, and other policies that make it difficult for air quality agencies to reduce emissions from wood burning devices or encourage use of cleaner burning devices.
- Potential financial incentives and sources of funding to change out older, uncertified home wood burning devices to cleaner burning devices.

As they studied these five topics, the work group identified criteria for successful solutions to the problem of wood smoke pollution. Solutions must:

- Reduce a large amount of real emissions.
- Be cost effective.
- Be practical, feasible, able to be implemented and enforced, and politically acceptable.
- Consider effects on low-income communities.
- Protect public health, achieve attainment, and prevent nonattainment.

Overview of recommendations for reducing PM_{2.5}

The work group developed recommendations for ways to reduce PM_{2.5} emissions from uncertified wood burning devices, protect public health, and prevent violations of EPA standards. Emissions from improper use of certified wood burning devices and increasing emissions from existing as well as new fireplaces are also concerns, and are addressed in these recommendations. There are four main approaches:

- Update curtailment laws.
- Provide funding for change-out programs.
- Provide funding for a public education/information campaign.
- Allow area-wide bans or phase-outs of uncertified devices.

The work group worked hard, meeting eight times in six months, to identify and evaluate numerous strategies for reducing the impact of wood smoke. The work group proposes three recommendations for immediate consideration. Ecology will keep working with members of the group to recommend additional long-term strategies.

Recommendations for immediate action

The work group proposes three recommendations for immediate action: update curtailment laws, provide financial incentives to replace or remove highly polluting uncertified wood burning devices, and require home sellers to disclose the presence of uncertified wood burning devices.

Update curtailment laws

The problem:

During the winter, colder weather periodically traps smoke close to the ground. When this happens, PM_{2.5} builds up rapidly to high levels that can exceed federal air quality standards and harm peoples' health. RCW 70.94.473 authorizes air quality agencies to ban the use of wood burning devices during these periods. These burn bans are called curtailments.

Curtailments have two stages. During stage 1 curtailments, uncertified stoves, uncertified inserts, and fireplaces cannot be used. During stage 2 curtailments, no wood burning

device of any kind can be used. In both stages, wood burning devices can only be used if they are a sole source of heat. However, it is uncommon for a wood burning device to be a sole source of heat.

Two-stage curtailments have been highly effective in avoiding high PM_{2.5} levels, and are an effective incentive for people to upgrade to cleaner burning stoves and inserts. Washington should continue to use a two-stage curtailment program to prevent air pollution levels from exceeding the air quality standard and to protect public health. However, the criteria for calling curtailments in RCW 70.94.473 are totally inconsistent with the recently revised federal PM_{2.5} standard. The current criteria do not allow air quality agencies to call curtailments early enough to prevent high levels of PM_{2.5}. The current criteria allow agencies to call curtailments at 35 micrograms per cubic meter for stage 1 and 60 micrograms per cubic meter for stage 2. Under these “trigger levels,” agencies cannot call a curtailment until PM_{2.5} levels are already higher than the recently revised federal air quality standard of 35 micrograms per cubic meter. Consequently, these trigger values should be updated.

The recommendation:

The work group developed proposed language to update the criteria for calling curtailments. The hearth products industry will initiate legislation on this issue.

The proposed policy keeps the two-stage burn curtailment approach, but takes a slightly different approach to trigger levels. The proposed criteria would allow air quality agencies to call a stage 1 curtailment when predicted weather conditions would trap smoke near the ground and cause air pollution levels to rapidly exceed air quality standards. A stage 2 curtailment could be called when PM_{2.5} levels reach 25 micrograms per cubic meter, and when weather conditions still create a high risk of exceeding air quality standards. However, if the air quality forecast is exceptionally bad and air pollution levels are expected to rise very rapidly, agencies would be authorized to call a stage 2 curtailment without first calling a stage 1. While this condition is expected to be rare, the low level of the revised federal standard makes it advisable for air quality agencies to have this authority.

See Appendix F for a full description of this proposal.

Provide financial incentives to replace highly polluting uncertified wood burning devices

The problem:

The revised federal PM_{2.5} standard is 46 percent lower than the previous federal standard. Some communities in Washington are now violating this standard, and others are close to violating it.

PM_{2.5} can rise very rapidly to levels at or above the revised standard. Since uncertified wood burning devices cause 70 percent more pollution than certified devices, it is essential to reduce the large number of uncertified, highly polluting devices. Replacing uncertified devices with certified ones will reduce overall emissions from wood burning devices and prevent pollution levels from rising as rapidly or as high during the winter. Replacing uncertified devices will also reduce the need for curtailments, and will make curtailments more effective when they are called.

One of the proven solutions to reducing PM_{2.5} is a program to remove old, highly polluting wood burning devices, or replace them with much cleaner ones. In 2007, Ecology requested a \$2 million appropriation to fund a change-out program for uncertified, highly polluting stoves. The Legislature appropriated \$500,000 of that request, which was used to award grants for financial incentive programs in Tacoma, Marysville, Yakima, and Colville. These programs are all designed to provide extra assistance to lower income families. The current change-out program is scheduled to end in fiscal year 2008.

Reducing the number of uncertified devices will reduce PM_{2.5} emission of, and reduce the risk of PM_{2.5} violations in communities across the state. The work group considers it very important that the legislature substantially increase the financial incentive programs to assist people with the cost of removing and changing out their older, high emitting devices. Change-out programs like this have proven successful in other states and have high potential for achieving the same success in Washington.

Continued financial assistance is essential because many of the people who use wood heat are lower- and middle-income families trying to save money on heating costs. Burning wood for supplemental heat is popular because heating costs are rising. This is especially true for electric heat, which is commonly used in Washington. In addition, many people continue to heat with wood because it is a traditional part of Washington life. The best way to reduce their PM_{2.5} contributions is to replace their uncertified devices with certified ones. Financial assistance is needed to encourage them to change-out these devices.

The recommendation:

The work group recommends the 2008 Legislature appropriate \$1.5 million of additional funding to continue the current change-out incentive program. Continuing the existing program would help to reduce PM_{2.5} levels in communities sooner, avoiding possible violations of PM_{2.5} limits that lead to substantial costs to businesses, communities and air quality agencies. It would also avoid the additional administrative costs of shutting down the current program and re-starting it at a future date.

Require seller disclosure of uncertified devices**The problem:**

Uncertified wood burning devices are still present and used in many homes. Many people, both buyers and sellers, aren't aware of:

- Health effects from wood smoke.
- How to burn correctly and most efficiently to reduce their emissions when they do burn.

Informing and educating people about the health effects of wood smoke and how to burn properly is critical.

The recommendation:

The work group recommends that, when a residence is sold, the seller must disclose the presence of an uncertified wood burning device. The real estate industry plans to initiate legislation on this issue.

The work group proposes to change the required disclosures on "Form 17." This form is provided to buyers of residential real estate. The changes to the form would inform buyers about the presence of an uncertified wood burning device on the property and provide them with educational information about health effects of wood smoke and best practices when burning wood indoors.

Recommendations for longer-term action

In addition to the three recommendations for immediate action, the work group recommends numerous strategies for further development. The work group agrees these strategies could achieve more PM_{2.5} reductions; however, more work is needed on program design and implementation issues. Also, some members of the work group have significant reservations about a few of these strategies in their present form. Ecology will work with members of the work group to complete recommendations on these strategies:

- A long-term change-out program to reduce the large number of uncertified wood burning devices.
- A public education/information campaign.
- Other implementation and compliance policies and activities.

A long-term change-out program

The problem:

As mentioned in other places in this report, some Washington communities are now violating the revised PM_{2.5} standard, and others are close to violating it. Since uncertified wood burning devices cause most of this pollution, it is essential to reduce the large number of uncertified, highly polluting devices. Reducing the number of uncertified devices will lower PM_{2.5} emissions and reduce the risk of violating the standards. It will also slow the rapid increase of pollution during poor weather conditions, and make curtailment programs more effective.

Programs that remove or change-out old, highly polluting wood burning devices are a proven and effective solution to reducing wood smoke pollution. Financial incentives to help people with the expense of changing out their old stoves and inserts are an essential part of the overall strategy. Many of the people using supplemental wood heat are lower- and middle-income families hard pressed to meet rising heating costs.

For a more complete description of the problem, see the section “Provide financial incentives to replace or remove highly polluting uncertified wood burning devices” on pages 8-9.

The recommendations:

- Ecology’s Air Quality Program will develop and recommend a budget for a long-term change-out program. This would be a substantial program implemented over several biennia. It would include special considerations for low-income homes.
- Eliminate sales tax on the purchase of cleaner certified wood stoves, inserts, and pellet stoves when replacing an uncertified device.

Washington law requires all wood burning devices to emit less than 4.5 grams per hour of PM_{2.5}. However, some certified devices emit just under that 4.5 gram standard while others emit considerably less. This strategy would exempt the lower-emitting devices from sales tax in order to encourage people to purchase the cleanest of the certified stoves or inserts. The work group disagrees about this strategy, so it needs to work more on which devices would be considered cleaner and how to implement the strategy. Ecology will work with the Department of Revenue to determine the documentation and procedures needed for the eligible devices. Ecology and the work group will continue to discuss this strategy and make future recommendations.

- Eliminate sales tax on the purchase of cleaner certified wood stoves, inserts, and pellet stoves for new construction.

This strategy is similar to the one above, but is designed to reduce emissions from the increased installation of wood burning devices and fireplaces in new construction. It also limits the sales tax incentive to licensed contractors. As in the previous strategy, the work group needs to develop criteria for which devices will be considered cleaner and how to implement the strategy. Ecology will work with the Department of Revenue to determine the documentation and procedures needed. The work group will continue to discuss this strategy and make future recommendations.

- Provide a credit toward the state portion of the real estate excise tax for sellers who remove and dispose of uncertified devices at the time of a property sale.

The work group recommends providing a tax credit toward the state's portion of the real estate excise tax when sellers document that they have removed an uncertified device within a certain timeframe before the time of a property sale, and that the old device was disposed of. The credit is for the removal and disposal of an uncertified device. It does not require that a new device be installed. This will encourage selling homeowners to change-out uncertified devices even if they are not eligible for any other financial incentives.

- Include replacement of uncertified devices as an eligible item in low-income weatherization programs.

The work group recommends that Ecology work with appropriate agencies to develop this strategy. Eligibility may not result in 100 percent replacement cost. The degree of assistance would be determined by the individual program and may vary between applicants depending on the overall replacement cost.

- Establish a low-interest loan program.

In addition to the direct financial aid program (above), a low-interest loan program would be highly beneficial in assisting people with the cost of changing out their uncertified device to a cleaner one. Ecology and the work group will develop recommendations about how to fund and implement a low-interest loan program. In principle, this program would be similar to the existing low-interest loan program available through local health departments for homeowners to replace failing septic systems along Puget Sound and Hood Canal.

- Reduce barriers to changing to gas stoves/inserts.

The work group strongly supports reducing barriers to changing from a wood burning device to a gas burning stove, insert, or fireplace. These barriers include high connection fees for extending gas to developments, and from streets to individual houses.

Because natural gas utilities are complex, Ecology and the work group need to work with natural gas utilities to identify specific proposals.

- Study fireplaces and develop fireplace strategies.

Fireplaces function much differently than wood stoves and inserts, but they do produce high levels of PM_{2.5}. They also remove heat from a house, resulting in even higher heating costs and energy demands. Ecology and the work group need to develop and assess strategies before making recommendations.

- Tighten the Washington State emission standard for home wood burning devices.

Washington's home wood burning device emission performance standards in RCW 70.94.457 were set in 1991. They are still the most stringent in the nation. Technology of wood burning devices has improved, however, and half of the wood burning devices sold burn 30 percent cleaner than the Washington standard.

The work group is divided on this topic. Some members of the work group do not support this strategy at all, while others do or at least want to evaluate it further. EPA may address emission limits for new wood burning devices. Ecology and the work group plan to monitor EPA's efforts and reassess this strategy to decide whether to make a recommendation.

Public education/information campaign

The problem:

Due to increased concerns about both health and nonattainment issues, it is more important than ever for people to comply with curtailments, change-out their uncertified, highly polluting devices, and burn properly. Curtailments alone will not be enough to reduce PM_{2.5} pollution. While curtailments can be enforced with penalties, the most effective action is to help people understand why they can't use wood burning at certain times, and how to burn correctly and most efficiently to reduce their emissions when they do burn.

Wood smoke, both indoors and outdoors, affects people's health. The success of the incentive and curtailment programs depends on people being more aware of the health effects of wood smoke, and participating in the incentive programs. It is essential that air quality and health agencies have funding to design and implement effective education and outreach campaigns, change-out programs, and curtailment programs.

The recommendations:

Funding is needed to conduct a widespread and effective campaign to educate the public about the problem of wood smoke and explain the change-out program.

- Implement a larger, more effective public education/information campaign to educate citizens about the problem of wood smoke and what they can do to fix it.

The work group recommends a substantial public information/education campaign. This would require a development budget and an annual budget for conducting the campaign. Air quality educators and communicators in Washington and surrounding areas have formed a network called the Northwest Air Quality Communicators (NWAQC). The NWAQC shares information as well as resources to develop and conduct region-wide education and awareness programs. Based on a recent program developed and implemented by the NWAQC, it would cost about \$500,000 to \$750,000 to develop and about \$350,000 to \$500,000 per year to run an effective campaign. If this campaign were to be funded, the NWAQC should work with a consultant to develop it.

Key objectives of the education campaign would include:

- Explaining why it's important to use wood burning devices properly and how to do so.
- Educating about the harmful health effects on people in both their home and in their neighborhood.
- Increasing awareness of change-out programs and replacing uncertified, highly polluting wood burning devices with cleaner ones.

Special efforts will need to be made to reach certain key audiences, including: low-income people, non-English speaking people, neighborhoods with large numbers of wood smoke complaints, frequent users of wood burning devices, and the general public. Some key partners who will assist in getting these messages out include pulmonologists, cardiologists, internal medicine specialists, nurse practitioners, general health care providers, real estate industry, hearth industry, businesses, low-income service providers, renters, landlords, schools, and others.

- Identify implementation needs for running effective change-out, education, and curtailment programs.

Running effective programs requires adequate staffing. Staffing is needed for developing an effective program, coordinating with retailers, identifying partner organizations, and working with low-income assistance providers. Curtailment programs have limited effectiveness unless there is adequate staff to educate the public, and enforce the laws and rules. Ecology and local air quality agencies should identify staffing needs and additional resources needed to run effective programs.

- Identify monitoring and forecasting needs.

Air quality agencies should work together to identify priority needs and funding requirements for monitoring air quality and forecasting tools. Monitoring air quality helps identify where risks and impacts to public health exist. The agencies should assess whether recommendations are needed.

- Coordinate with tribal jurisdictions.

Many of Washington's airsheds are shared with tribal jurisdictions with different laws and rules. Activities that affect air quality in either jurisdiction impact the air quality of both the state and tribes. Air quality agencies and tribes will need to coordinate their programs in order to protect air quality.

Implementation and compliance policies and activities

The problem:

Curtailments, change-out programs, and public education/information may not be sufficient or yield fast enough response to prevent violations of the federal standards. Air quality agencies need additional tools in areas where PM_{2.5} levels are high. Banning or phasing out uncertified devices in some areas may be necessary to prevent or reduce high PM_{2.5} levels and protect public health.

The recommendation:

The work group thinks air quality agencies need additional tools to reduce wood smoke emissions when areas are at risk of high levels of PM 2.5. The work group supports allowing air quality agencies, under certain conditions, to ban or phase out use of uncertified stoves.

This strategy would give Ecology, local air quality agencies, health departments, and local governments authority to ban the use of uncertified wood stoves, inserts, or other wood burning devices in high-risk areas. It could allow agencies to require the removal of these uncertified devices if they deem it necessary. This strategy has broad support among the work group, but it also recognizes that this is a complex and far-reaching policy. The work group needs to further develop the details of this strategy. Many issues need to be considered. These include minimum notification periods; determining which agencies should have authority; phasing-in a ban; how to identify uncertified devices; how to conduct compliance; addressing low-income households; and addressing homes with wood burning devices as a sole source of heat.

This strategy would broaden the provisions of RCW 70.94.477 which currently allow Ecology or local air quality agencies to "prohibit the use of solid fuel burning devices" if it is for the "sole purpose of a contingency measure." A contingency measure can only be used when strategies used to return an area to attainment status did not work.

Conclusion

In many areas of Washington, pollution from wood smoke is causing significant health effects. These effects include increased incidence of asthma and other lung diseases, heart attacks, and strokes. The work group's recommendations for immediate action are critically important to protecting public health and minimizing the number of communities that violate federal air quality standards. Longer-term recommendations are also very important, but need further development.

These proposals are not inexpensive or easy. They are practical, effective, and essential if Washington is to avoid even higher costs from harmful health effects and federal controls.

Appendix A - Substitute House Bill 2261

CERTIFICATION OF ENROLLMENT

SUBSTITUTE HOUSE BILL 2261

Chapter 339, Laws of 2007

60th Legislature
2007 Regular Session

WOOD SMOKE EMISSIONS

EFFECTIVE DATE: 07/22/07

Passed by the House April 16, 2007
Yeas 67 Nays 28

FRANK CHOPP

Speaker of the House of Representatives

Passed by the Senate April 5, 2007
Yeas 36 Nays 12

BRAD OWEN

President of the Senate

Approved May 4, 2007, 4:57 p.m.

CHRISTINE GREGOIRE

Governor of the State of Washington

CERTIFICATE

I, Richard Nafziger, Chief Clerk of the House of Representatives of the State of Washington, do hereby certify that the attached is **SUBSTITUTE HOUSE BILL 2261** as passed by the House of Representatives and the Senate on the dates hereon set forth.

RICHARD NAFZIGER

Chief Clerk

FILED

May 7, 2007

**Secretary of State
State of Washington**

SUBSTITUTE HOUSE BILL 2261

AS AMENDED BY THE SENATE

Passed Legislature - 2007 Regular Session

State of Washington 60th Legislature 2007 Regular Session

By House Committee on Select Committee on Environmental Health
(originally sponsored by Representatives Campbell, Hudgins, Morrell,
Hunt and Ormsby)

READ FIRST TIME 2/28/07.

1 AN ACT Relating to an evaluation of the state wood smoke reduction
2 program; amending RCW 70.94.473; and adding new sections to chapter
3 70.94 RCW.

4 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF WASHINGTON:

5 **Sec. 1.** RCW 70.94.473 and 2005 c 197 s 1 are each amended to read
6 as follows:

7 (1) Any person in a residence or commercial establishment which has
8 an adequate source of heat without burning wood shall:

9 (a) Not burn wood in any solid fuel burning device whenever the
10 department has determined under RCW 70.94.715 that any air pollution
11 episode exists in that area;

12 (b) Not burn wood in any solid fuel burning device except those
13 which are either Oregon department of environmental quality phase II or
14 United States environmental protection agency certified or certified by
15 the department under RCW 70.94.457(1) or a pellet stove either
16 certified or issued an exemption by the United States environmental
17 protection agency in accordance with Title 40, Part 60 of the code of
18 federal regulations, in the geographical area and for the period of

1 time that a first stage of impaired air quality has been determined, by
2 the department or any authority, for that area. A first stage of
3 impaired air quality is reached when:

4 (i) Fine particulates are at an ambient level of thirty-five
5 micrograms per cubic meter measured on a twenty-four hour average; and

6 (ii) Forecasted meteorological conditions are not expected to allow
7 levels of fine particulates to decline below thirty-five micrograms per
8 cubic meter for a period of forty-eight hours or more from the time
9 that the fine particulates are measured at the trigger level; and

10 (c) Not burn wood in any solid fuel burning device in a
11 geographical area and for the period of time that a second stage of
12 impaired air quality has been determined by the department or any
13 authority, for that area. A second stage of impaired air quality is
14 reached when:

15 (i) A first stage of impaired air quality has been in force and not
16 been sufficient to reduce the increasing fine (~~particle~~
17 ~~particulate~~) particulate pollution trend;

18 (ii) Fine particulates are at an ambient level of sixty micrograms
19 per cubic meter measured on a twenty-four hour average; and

20 (iii) Forecasted meteorological conditions are not expected to
21 allow levels of fine particulates to decline below sixty micrograms per
22 cubic meter for a period of forty-eight hours or more from the time
23 that the fine particulates are measured at the trigger level.

24 (2) Until June 30, 2009, an authority comprised of one county east
25 of the crest of the Cascade mountains with a population of equal to or
26 greater than four hundred thousand people, may determine by rule an
27 alternative ambient air level of fine particulates that defines when a
28 first stage and when a second stage of impaired air quality exists
29 under subsection (1) of this section. All other criteria of subsection
30 (1) of this section continue to apply to a county subject to this
31 subsection.

32 (3) Actions of the department and local air pollution control
33 authorities under this section shall preempt actions of other state
34 agencies and local governments for the purposes of controlling air
35 pollution from solid fuel burning devices, except where authorized by
36 chapter 199, Laws of 1991.

1 NEW SECTION. **Sec. 2.** A new section is added to chapter 70.94 RCW
2 to read as follows:

3 The legislature finds that there are some communities in the state
4 in which the national ambient air quality standards for PM 2.5 are
5 exceeded, primarily due to wood smoke emissions, and that current
6 strategies are not sufficient to reduce wood smoke emissions to levels
7 that comply with the federal standards or adequately protect public
8 health. The legislature finds that it is in the state's interest and
9 to the benefit of the people of the state to evaluate additional
10 measures to reduce wood smoke emissions and update the state wood smoke
11 control program.

12 NEW SECTION. **Sec. 3.** A new section is added to chapter 70.94 RCW
13 to read as follows:

14 (1) The department shall convene and chair a work group to study
15 the impacts of wood smoke from solid fuel burning devices on
16 communities in Washington and make recommendations to the legislature
17 on practical and cost-effective opportunities to reduce exposure to
18 wood smoke from solid fuel burning devices and meet the new national
19 air quality standards for fine particulates in Washington state. The
20 work group shall be established by the director and include
21 representatives from the department, the state department of health,
22 regional air quality agencies, local health departments, related
23 industry representatives, and nongovernmental health organizations.
24 Recommendations may include statutory or regulatory changes,
25 incentives, and other strategies that will reduce ambient PM 2.5
26 pollution. Recommendations should be presented to the governor and to
27 the legislature by December 1, 2007.

28 (2) In carrying out its assignment the work group shall include,
29 but not be limited to, the following considerations:

30 (a) Communities in the state that have elevated levels of PM 2.5
31 pollution;

32 (b) The contribution of pollution from solid fuel burning devices
33 to potential violations of federal air quality standards;

34 (c) Strategies used in other states, regions, or cities to reduce
35 wood smoke pollution levels and effectiveness of these strategies;

36 (d) State laws, rules, fees, utility regulations, and other

1 policies that may affect the ability to reduce emissions from solid
2 fuel burning devices or encourage the use of cleaner burning devices;
3 and

4 (e) Potential financial incentives and sources of funding to change
5 out older solid fuel burning devices to cleaner burning devices.

Passed by the House April 16, 2007.

Passed by the Senate April 5, 2007.

Approved by the Governor May 4, 2007.

Filed in Office of Secretary of State May 7, 2007.

Appendix B - RCW 70.94.473

Limitations on burning wood for heat (curtailments)

RCW 70.94.473

Limitations on burning wood for heat.

(1) Any person in a residence or commercial establishment which has an adequate source of heat without burning wood shall:

(a) Not burn wood in any solid fuel burning device whenever the department has determined under RCW [70.94.715](#) that any air pollution episode exists in that area;

(b) Not burn wood in any solid fuel burning device except those which are either Oregon department of environmental quality phase II or United States environmental protection agency certified or certified by the department under RCW [70.94.457](#)(1) or a pellet stove either certified or issued an exemption by the United States environmental protection agency in accordance with Title 40, Part 60 of the code of federal regulations, in the geographical area and for the period of time that a first stage of impaired air quality has been determined, by the department or any authority, for that area. A first stage of impaired air quality is reached when:

(i) Fine particulates are at an ambient level of thirty-five micrograms per cubic meter measured on a twenty-four hour average; and

(ii) Forecasted meteorological conditions are not expected to allow levels of fine particulates to decline below thirty-five micrograms per cubic meter for a period of forty-eight hours or more from the time that the fine particulates are measured at the trigger level; and

(c) Not burn wood in any solid fuel burning device in a geographical area and for the period of time that a second stage of impaired air quality has been determined by the department or any authority, for that area. A second stage of impaired air quality is reached when:

(i) A first stage of impaired air quality has been in force and not been sufficient to reduce the increasing fine particulate pollution trend;

(ii) Fine particulates are at an ambient level of sixty micrograms per cubic meter measured on a twenty-four hour average; and

(iii) Forecasted meteorological conditions are not expected to allow levels of fine particulates to decline below sixty micrograms per cubic meter for a period of forty-eight hours or more from the time that the fine particulates are measured at the trigger level.

(2) Until June 30, 2009, an authority comprised of one county east of the crest of the Cascade mountains with a population of equal to or greater than four hundred thousand people, may determine by rule an alternative ambient air level of fine particulates that defines when a first stage and when a second stage of impaired air quality exists under subsection (1) of this section. All other criteria of subsection (1) of this section continue to apply to a county subject to this subsection.

(3) Actions of the department and local air pollution control authorities under this section shall preempt actions of other state agencies and local governments for the purposes of controlling air pollution from solid fuel burning devices, except where authorized by chapter 199, Laws of 1991.

[2007 c 339 § 1; 2005 c 197 § 1; 1998 c 342 § 8; 1995 c 205 § 1; 1991 c 199 § 504; 1990 c 128 § 2; 1987 c 405 § 6.]

Notes:

Finding -- 1991 c 199: See note following RCW [70.94.011](#).

Severability -- 1987 c 405: See note following RCW [70.94.450](#).

Appendix C - RCW 70.94.477

Limitations on use of solid fuel burning devices (as a contingency measure)

RCW 70.94.477

Limitations on use of solid fuel burning devices.

(1) Unless allowed by rule, under chapter 34.05 RCW, a person shall not cause or allow any of the following materials to be burned in any residential solid fuel burning device:

- (a) Garbage;
- (b) Treated wood;
- (c) Plastics;
- (d) Rubber products;
- (e) Animals;
- (f) Asphaltic products;
- (g) Waste petroleum products;
- (h) Paints; or

(i) Any substance, other than properly seasoned fuel wood, which normally emits dense smoke or obnoxious odors.

(2) For the sole purpose of a contingency measure to meet the requirements of section 172(c)(9) of the federal clean air act, a local authority or the department may prohibit the use of solid fuel burning devices, except fireplaces as defined in RCW 70.94.453(3), wood stoves meeting the standards set forth in RCW 70.94.457 or pellet stoves either certified or issued an exemption by the United States environmental protection agency in accordance with Title 40, Part 60 of the code of federal regulations, if the United States environmental protection agency, in consultation with the department and the local authority makes written findings that:

(a) The area has failed to make reasonable further progress or attain or maintain a national ambient air quality standard; and

(b) Emissions from solid fuel burning devices from a particular geographic area are a contributing factor to such failure to make reasonable further progress or attain or maintain a national ambient air quality standard.

A prohibition issued by a local authority or the department under this subsection shall not apply to a person in a residence or commercial establishment that does not have an adequate source of heat without burning wood.

[1995 c 205 § 2; 1990 c 128 § 3; 1987 c 405 § 9.]

Notes:

Severability -- 1987 c 405: See note following RCW 70.94.450.

Appendix D - Strategies considered but not recommended

The work group also considered other strategies. When these strategies were discussed and evaluated for meeting the criteria for successful solutions, they weren't identified as good recommendations.

- Eliminate sales tax on cleaner burning devices that replace existing uncertified devices.

The work group feels that this approach will not provide enough incentive for replacing uncertified devices. This may be a good approach for encouraging people to install cleaner devices in new construction.

- Require registration of devices at time of real estate sale.

Over time the strategy would result in a list of homes with uncertified devices that could be used to target education and change out programs. Registration helps with targeting programs, but it doesn't by itself achieve any reductions.

- Require removal or change out of uncertified devices during remodel.

The work group discussed ways to implement this strategy and determined that it would be very difficult to implement and was not practical.

- Require change out of uncertified devices and fireplaces when apartments are converted to condominiums.

This approach targets a very specific niche. When apartments are converted to condominiums, sometimes the physical modifications are extensive and other times there are few or no modifications. In areas where this strategy is needed, the work group believes this could be handled through local planning departments and does not require statutory changes.

- Require removal or change out of uncertified devices at the time of real estate sale.

According to the work group's real estate representative, in Washington about five percent of the existing houses change ownership each year and all houses do not change ownership at the same frequency. At this rate, it would take more than 20 years to deal with all of the existing uncertified devices. Also, the real estate representative felt this strategy unfairly singled out home sellers by requiring them, but not others, to remove uncertified devices. An opinion was also expressed that a requirement like this might negatively impact homes sales. The work group was strongly divided on this strategy, but instead agreed on a strengthened authority for an area-wide approach.

- Provide incentives for builders that install exclusively low or no emission devices (tax reductions, fee reductions, or others).

The work group feels that this approach will not provide enough incentive for builders to install cleaner burning or no devices in new construction.

- Implement geographic or density based limits on installations in new construction in higher risk areas.

The work group believes city and county planning departments already have this authority. The work group also feels this tool would be best used in nonattainment areas or potential nonattainment areas for addressing growth.

- Require long plat developments to bring in natural gas or make sure propane is available.

The work group felt this strategy was not feasible for two reasons. First, bringing natural gas to many areas is cost prohibitive. Second, the variability in local building codes for propane tank installation makes this unfeasible.

- Tighten Stage 1 curtailments to only allow devices that meet Washington State standards to be used.

This strategy couldn't be enforced since Ecology and local air quality agencies do not have the authority to enter homes to verify if the device meets Washington State standards.

Appendix E - Programs in other areas

Regulatory Change-Out Programs

State	City/County/ State	Whose rules/ ordinances?	Change-out or removal required at time of sale?	Was the program imple- mented?	Is disclosure at time of sale required?	Inspection	Enforcement	Population*	Other information
MT	Lincoln County (Libby)	Lincoln County Environmental Health Department	No	Yes	No	No	Yes	County: 19,226 (2006 Est.)	Libby: 2,626 (2000 Est.). Includes a cut-off date for when these devices may no longer be used.
	Missoula County	Missoula County Health Department	Yes	Yes	No	Yes	Yes	101,417 (2006 Est.)	
OR	Bend	City Commission	Yes	Yes	Yes	No	Yes	52,029 (2000 Est.)	Buyer and seller must sign a "disclosure certificate" prior to closing of the real estate transaction.
	Klamath Falls		Yes	Yes	Unknown	Unknown	Unknown	19,462 (2000 Est.)	
	Ashland	City of Ashland	Yes	Yes	Yes	Unknown	Yes	19,522 (2000 Est.)	
	Medford	City of Medford	Yes	Yes	Yes	Unknown	Yes	66,638 (2003 Est.)	
	Eagle Point		Yes	Yes	Unknown	Unknown	Unknown	4,797 (2000 Est.)	
	Talent	City of Talent	Yes	Yes	Yes	Unknown	Yes	5,589 (2000 Est.)	
	Central Point	City of Central Point	Yes	Yes	Yes	Unknown	Yes	12,493 (2000 Est.)	
	Phoenix		Yes	Yes	Unknown	Unknown	Unknown	4,060 (2000 Est.)	
	Jacksonville		Yes	Yes	Unknown	Unknown	Unknown	2,235 (2000 Est.)	
	Jackson County	Board of County Commissioners	Yes	Yes	Yes	No	Yes	197,071 (2006 Est.)	
	Oregon State	Legislative statute	Yes	No	No - see other information	Unknown	Unknown		Chapter 468A.505 Removal of noncertified woodstoves: Requires the removal and destruction upon sale of a home in any PM10 nonattainment area in the state that does not attain compliance with the PM 10 standard. Recent legislation that did not pass, would have required disclosure at time of sale.
WA	King County	King County Board of Health	Yes	No	No	Yes	Yes	1,826,732 (2006 Est.)	Program was never funded.
NV	Washoe County	District Health Department	Yes	Yes	No	Yes	Yes	County: 396,428 (2006 Est.)	Reno: 193,882 (2003 Est.)
CA	Sacramento	Sacramento Metropolitan AQMD	Yes	Yes	No	Unknown	Yes	445,335 (2003 Est.)	Phase II: Effective 10/26/2007 no permanently installed device may be sold unless it meets specific requirements.

Appendix F - Curtailment proposal

Ecology and Local Air Agencies are authorized to call burn bans as follows:

- For Stage 1: when meteorological conditions are predicted to cause PM_{2.5} levels to exceed the federal air quality standard within 48 hours.
- For Stage 2 (following stage 1): when meteorological conditions are predicted to cause PM_{2.5} levels to exceed the federal air quality standard within 24 hours and the PM_{2.5} 24-hour average is at 25 micrograms per cubic meter.
- For stage 2 (stand alone): It is the intent that a two-stage curtailment plan be the main mechanism used to avoid episodic exceedances of the PM_{2.5} standard. Agencies shall maximize the use of stage 1 burn bans, and minimize the use of stage 2 burn bans without first calling a stage 1 burn ban. Consequently, a stage 2 burn ban may be called without calling a stage 1 burn ban only on an exceptional basis when all of the following occur:
 - The PM_{2.5} 24-hour average has reached or exceeded 25 micrograms per cubic meter, and
 - Meteorological conditions have caused PM_{2.5} levels to rise rapidly, and
 - Meteorological conditions are predicted to cause PM_{2.5} levels to exceed the standard within 24 hours, and
 - Meteorological conditions are highly likely to prevent sufficient dispersion of PM_{2.5}.
- Within 90 days of calling a stage 2 burn ban with no prior stage 1 ban, using methodology developed by Ecology, Ecology and local air quality agencies shall document the air quality and meteorological conditions that led to the stage 2 ban. The documentation shall include an assessment of why a stage 1 burn ban was not called prior to the stage 2 and whether there are any changes in procedures that could have allowed the agency to call stage 1 burn ban prior to the stage 2 ban.
- Ecology and local air quality agencies shall evaluate and report program results to the Legislature by September 1, 2011 (three years of implementation of this RCW). Ecology shall develop a methodology for these evaluations and reports that shall be used by all agencies exercising the authority in this paragraph.