

# **Residential Indoor Wood Burning Bylaw Workshop**

**October 20, 2002  
Kelowna, BC**

## **Workshop Summary**

**Hosted / sponsored by:**

**The Central Okanagan Regional Air Quality Program &  
The Hearth, Patio and Barbecue Association of Canada**



## **Acknowledgements**

A special thanks to everyone who participated in the Residential Indoor Wood Burning Bylaw Workshop, especially to those who travelled from outside of the Central Okanagan. Your input was invaluable for the formulation of this report, an important next step in our collective effort to develop clean air strategies in a complex world. Special thanks to Cathy Cottrell Tribes of the Yukon Development Corporation whose hard work made this report a reality.

## **Workshop Goal**

The focus of the workshop was quite simply to bring together the key stakeholders and then to work collectively to determine how barriers could be overcome to put in place workable residential solid fuel burning bylaws that enjoy good public, professional and industry support -- ones that could serve as a template for other jurisdictions contemplating similar such bylaws. Bylaws such as these have been identified by the Central Okanagan Regional Air Quality Committee as important strategies to reduce the harmful effects of concentrated wood smoke in our neighbourhoods.

This report will serve as a valuable tool for workshop participants and others formulating indoor wood burning bylaws at the provincial and municipal level. Workshop participants will also provide valuable feedback and serve as a sounding board to anyone developing an indoor wood-burning bylaw. It is projected that bylaws pertaining to indoor wood burning will start to be developed at the provincial and municipal levels starting in early 2003. The project team is pleased to advise that the Province of BC has expressed an interest in taking the next steps to the next level and to prepare a template bylaw.

Once again thank you for participating in our workshop and remember, it is not enough to get it right, you must also be effective.

All the best, cheers, Tex and Corey.

## Attendees

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## Summary

*The workshop opened on time with Corey Davis and Tex McLeod welcoming the participants, leading the introductions and setting the stage for the workshop. Corey and Tex encouraged the participants to consider the following two questions:*

1. How do we overcome barriers and put in place a workable burn bylaw that enjoys good public, professional and industry support and serves as a template for other jurisdictions?  
Barriers:
  - Enforcement
  - Communicating the problems, the issues, and the existing rules
  - Dealing with the needs of the disadvantaged -- heating and self sufficiency
  - Balancing the rural versus urban burden
  - Special interests
  - Neighbour relations -- makes folks reluctant to report nuisances
  - Getting buy-in from politicians
  - Overcoming cultural and traditional burn practices
  - Dealing with outdoor appliances
  - Dealing with masonry fireplaces and factory fireplaces
  - Staying on top of a fast changing regulatory environment, one concerned with smaller and smaller particles... moving from PM10 to PM2.5 to PM1 to even PM0.1
  - Lack of resources (money and people)
2. Who are the stakeholders and how can we involve them in forming the bylaw so that it is more easily accepted?

*Next the participants divided into two work groups:*

Work Group 1, lead by Corey Davis and Work Group 2, lead by Tex McLeod.

### **Work Group 1**

Corey Davis  
Patty Hanson  
Richard White  
Christine Rigby  
Gary Bell  
Brian Wiens  
Zigi Gadowski  
John Crouch  
Vic Enns  
Ken Cooper

### **Work Group 2**

Tex McLeod  
Paul Willis  
Peter Schwarzhoff  
Dennis Fudge  
Robert Hughes  
Sharon Shepherd  
Kelly Roth  
Cathy Cottrell-Tribes

*Each group working independently came up with a different approach to answering the two questions.*

#### GROUP 1

Work Group 1 looked at a bylaw, one that to be effective would of necessity include the following elements:

- Smoke Opacity Limits
- Fuel Prohibitions
- Obnoxious Odours
- No Burn Periods
- Removal of uncertified appliances upon the purchase and sale of a building

*For each of the elements listed above, Group 1 looked at the barriers and how to overcome them.*

#### **Wood smoke opacity limit.**

This would limit the denseness of the smoke allowed to be coming from the chimney. Opacity is a measurement of the degree to which smoke obstructs the view of objects behind it. This kind of bylaw has been enacted within the City of Seattle and the City of Spokane, Washington. It can be set up as a nuisance regulation whereby people are legally responsible for the impact of smoke from their chimney on their neighbours. On the basis of a complaint that excessive smoke is impacting a neighbour's health or enjoyment of their property, the person responsible for the smoke can be cited.

The legal opacity for smoke emissions from wood stoves or fireplaces is up to 20% within Washington State. The 20% limit can usually be achieved by building small, hot fires, allowing the fire to get plenty of air and making sure that properly seasoned wood is being burned. We would have to determine if this was an appropriate level for the Central Okanagan. The City of Whitehorse used an opacity limit of 50% in their former bylaw.

Measuring the opacity of smoke can be done in two ways 1) a person who is certified for visible emissions measuring may visually assess a smoke plume coming from a chimney or 2) using an instrument called a nephelometer smoke opacity can be measured directly from the chimney flume. A nephelometer instantaneously measures the scattering coefficient of light caused by suspended particles in the air.

#### Measuring Visible Emissions

Certified visible emissions test results provided by certified visible emissions measurement personnel, have been found to hold up in a court of law. The British Columbia Ministry of Water, Land and Air Protection uses these tests for regulating industry emissions.

The Visible Emissions Certification course takes place in Prince George among other locations and currently costs \$375. The initial certification course lasts 2 to 3 days

depending on how quickly a person learns to determine smoke opacity. Certification lasts 6 months. Re-certification costs \$325 and typically takes only one day.

One drawback of this technique is that visible opacity measuring cannot be done at night; however, someone who burns inappropriately at night usually burns during daylight hours and during the weekend. Indoor wood burning profiles change during the weekend when people are off work and are around the house. Households causing a nuisance to neighbours that do not burn between Monday and Friday would most likely burn over the weekend when a bylaw officer would be able to observe daylight burning episodes.

In order to properly measure emissions, there needs to be

- a white background for dark emissions and a dark background for white emissions. This could be a problem in some areas due to foliage, buildings in the background, or weather conditions.
- a certain distance between the measurer and the smoke flume (3 times the distance of the height of the chimney). This is not a problem in most instances.
- approximately 30 uninterrupted minutes of visible assessment to make a proper opacity measurement. Bylaws enacted in other areas allow for a 20 minute start up period and 20 minute burn down period where the opacity of smoke can be high, so a 30 minute observation time would be appropriate for bylaw personnel.

The group's consensus was that visible emissions measuring of opacity would be a viable method of enforcing the opacity bylaw.

#### Measuring with a Nephelometer

This method could be used at night and is a more precise method of measuring opacity; however, a sample stream of smoke is needed directly from the chimney to get an opacity reading. Bylaw personnel would need to be trained in nephelometer usage. It has been determined that nephelometer results will hold up in a court of law. A portable nephelometer costs between \$3000 and \$5000.

The main problem with using a nephelometer is that a sample stream of the smoke is required, which means climbing on top of the roof to get a reading. Residents and bylaw personnel would most likely find this method intrusive and dangerous; however, this method could be used to back up visual readings in specific cases where the homeowner would like the test done.

A nephelometer test of opacity could be used within neighbourhoods to test localized ambient air quality over a period of time. This would be a good educational tool to get the whole neighbourhood involved. The results would be used to demonstrate to the neighbourhood just how bad their air quality actually gets when wood stoves in their neighbourhood are producing too much smoke.

#### Education

Enforcement personnel should be trained in methods to educate citizens on how to build a proper fire. Education should include a segment on comparing the costs of burning in an

old style stove or fireplace compared to the costs of using new technology stoves, which use less wood by burning more efficiently (true cost accounting). WETBC would be willing to work with municipalities to provide a training module to bylaw personnel on proper wood stove usage and fire building.

### Fines

Would the fine go to the homeowner or to the tenants?

### Recommendations

Do not worry about fines in the short term. Test the opacity bylaw within a pilot project context to ease the community into the bylaw first by working out any kinks in the system. Within this context citizens would be more willing to accept a permanent bylaw once it was demonstrated that the pilot phase was successful. The pilot project would be a great educational tool and would have a positive impact in many nuisance complaint cases.

### **Fuel Prohibitions**

It is equally important to let people know what to burn as it is to tell what not to burn. With that in mind, a maximum moisture content limit for wood would be set within the fuel prohibition sections of many bylaws, including the Central Okanagan's bylaw. The moisture content of wood is easily measured with a hand held moisture meter. This inclusion in the bylaw would help to prevent people from burning green wood. The bylaw could also extend to any businesses selling wood, requiring businesses to disclose the moisture content of wood to the buyer so they would be aware of whether or not they were allowed to burn the wood, or if they had to let it dry for several more months. The bylaw would also encourage people to store and dry their wood more appropriately.

### **Obnoxious odours**

Homeowners burning extremely wet wood, garbage or other prohibited materials usually cause obnoxious odours. A residential nuisance bylaw in Kelowna protects people from obnoxious odours; however, solid fuel burning appliances are currently deemed exempt from this bylaw. The addition of obnoxious odours to a bylaw would complement a moisture content limit bylaw for fuel wood so that either infraction would require the cessation of burning and therefore eliminate the problem. The addition of obnoxious odours to the bylaw would complement the prohibited burning materials section found in most current bylaws and provincial regulations.

### **No Burn Periods**

If a burn ban is issued, all outdoor burning should be banned as well.

To trigger a no burn period it may be better to use micrograms per cubic meter levels instead of the air quality index. For example, the first stage of the burn ban could be implemented at 35 ug/m<sup>3</sup> and the second stage could be implemented at 60 ug/m<sup>3</sup>.

Historical air quality data for a given region will help authorities to set an appropriate pollution level that triggers the burn ban. The level at which the burn ban is implemented should be where it will make a difference in air quality, but at the same time, not turn the

public against the bylaw. If the levels are set too high, then the burn bans will seldom be used and if the levels are set too low, then burning will seldom be allowed.

### Education

The use of a live web cam could serve to show residents what the air quality is like in the area (the haze factor). It helps people put a number to a picture so they can understand what degraded air quality looks like. It may help people accept the idea of what they need to do to overcome a degraded air quality situation.

### Recommendation

Develop the program and first run it as a pilot project to work out the kinks and get the public's support and acceptance. Must make sure that any communication sent out to the community is easy to understand and is credible. A citizen's advisory group may assist by reviewing any proposed materials.

## **Non Certified Appliance Removal upon the Sale of a Building**

The participants were unaware of any municipality in Canada using this type of bylaw, although similar kinds of bylaws are currently in effect for private septic systems. This bylaw would only apply to wood stoves and inserts although, it could be broadened to include conventional wood burning fireplaces.

If this bylaw was implemented how would the homeowner know that they had to remove the uncertified appliances? (through the real estate board or land titles office).

How would this program be tracked?

Would need to involve the insurance industry, real estate industry and building inspections services etc.

The responsibility for removal of non-certified wood stoves or inserts shall be the responsibility of the seller, unless the buyer and seller agree in writing that it shall be the buyer's responsibility.

In Bend, Oregon a disclosure certificate must be prepared by the seller, executed by the seller and the buyer, and delivered by the seller to the buyer at the closing of any real estate transaction involving the real property upon which the structure containing the wood stoves or fireplace inserts is located. A copy of a disclosure certificate after execution and delivery must also be submitted to the City of Bend Development Services, Building Department by the seller.

The consensus of the group was that some research needs to be done to figure out the best method of ensuring that homeowners are notified of this bylaw (especially when selling the house) and a method of ensuring that uncertified wood stoves or inserts are actually removed.

## *GROUP 2*

*Group 2 began in a different place, focusing on the education and communication necessary to overcome the barriers.*

*Key points of the discussion follow:*

### **Education and communication need to happen parallel to the bylaw development and enforcement**

to help get the bylaw accepted by city councilors, managers etc.,

to help wood burners understand the reasons for the bylaw

to gain the support of the media and the industry

to show the message is valid (the bylaw itself will be useful as an education tool to show wood burners that the message is legitimate).

### **Education and communication needs to be done by credible professionals that are excellent communicators.**

Insurance agencies, real estate, chimney sweeps, installers, retailers, building inspectors, fire fighters, and health professionals are examples of professionals that will add credibility to the message

### **Communication will be easier if key people are involved in developing the bylaw, because they will buy-in and help promote something that they have helped to create.**

Key people:

- insurance representatives,

- health professionals,

- city councilors

- city managers

- bylaw enforcement representatives

- air quality experts

- fire safety representatives

- energy specialists

- neighbourhood representatives

- wood stove retailers, installers and chimney sweeps

- appliance manufacturers / distributors

### **Messaging for acceptance**

Choose an appropriate approach – for example a “wood burning is good approach” that does not serve to alienate woodburners or a more neutral “we are already doing it well, here’s how to do it better” approach.

Also important to provide context and let folks know that wood burning is not specifically being targeted, rather, it is just one component of an overall program that also addresses other sources of air pollution.

Message needs to come ahead of the program( proactive / positive), so that we don’t get into the reactive / defensive mode

Messengers have to really know their stuff and be prepared for questions from left field.

Example of a neutral message: Triangle of burning: fuel, stove, user. Any one of these can compromise the air. Having a good stove increases the odds of burning cleaner.

**The messages that are most likely to be accepted are about safety, convenience and saving money / work.**

### **Enforcement Messaging**

Usually ticketing isn't feasible because there needs to be hard evidence of a misdemeanor and / or someone willing to testify, usually against their neighbour. So realistically bylaw officers council - rarely ticket. Neighbours may be more likely to lodge a complaint if the bylaw initially provides wording to the effect that when a complaint is lodged, everyone within the neighbourhood would get a brochure, or a video tape (like the BC video tape), or an invitation to go to stove school, in their mailbox. This would avoid neighbour to neighbour tensions.

### **Commitment to education needs to be a long term commitment**

changing the way Canadians burn wood is going to take a few generations – social change. For example – smoking, drinking and driving long term commitment of resources (people and money) is required

**Comprehensive education and communication that is tailored to key groups is important.**

Key groups:

- Schools
- Media
- Wood Heat Industry
- City Officials
- Politicians
- Others

### Schools

Educating kids may prove to be very useful. If we can convince the kids to “burn it smart” then we can “hook” their parents.

Interesting to note that in two-income families, the person that gets the stove fired up in the afternoon is the Grade 5 or 6 kid returning from school.

Ways to engage kids in their schools:

Clean burning contests for kids: See if they can get a non-EPA stoves to burn as cleanly as an EPA stove

What can I burn in my wood stove?: This might work as a demonstration at a trade show or energy fair. The kids could be presented with a display of commonly (and perhaps uncommonly) burnt items and asked to pick which items should actually go in a wood stove.

Colouring contests for younger kids: These could include a series of questions along the lines of “What’s wrong / what’s right with this picture?”

## Media

Media education has to go hand-in-hand with developing the bylaw because experience has shown that one reporter has a lot of power to paint the bylaw in a negative light  
Prince George's experience... biggest problems were unconvinced media and city officials. media seemed to look for a controversy around this issue to "sell" papers Also the timing was poor as the bylaw was introduced at the same time as the price of gas (for heating) went up

Educate media, communicate early, communicate often, and engage them in the process  
For example, in Whitehorse a wood heat educator evaluated a reporter's wood heating system, in her home, live and on-air.

Play up the reasons for the bylaw and appeal to people's self interests

health, safety and efficiency

make it clear that efficient burning improves safety and saves money and or effort by reducing the amount of wood required

## Industry

Specialty retailers are relatively easy to reach but it may be necessary to give some special attention to chain stores ("big box stores")

Perhaps the BC Video on efficient wood burning could be handed out by retailers with each new woodstove they sell. This is a relatively low cost and effective way to get out the clean burn message. Cathy Goddard at B.C.'s Ministry of Water Land and Air Protection is the contact for obtaining copies of the video.

## City Officials

City and Regional Councilors

City Managers

Key bureaucrats

Federation of Canadian Municipalities... Have someone from our group make a presentation at the FCM annual convention

Have a wood burning educator speak at provincial/territorial municipal association annual conventions.

Send a "Burn it Smart" brochure to every municipal politician

## Other

Insurance agencies

Surcharge all folks with woodstoves and then put in place mechanisms to reimburse portions of the surcharge depending on if they have an EPA stove, a maintenance contract with a certified chimney sweep, if they've gone to a "stove school", etc.

Fire officials

Health officials

Inspectors

Near the end of Group 2's discussion the participants touched on a number of other topics which are briefly noted below.

**Non-certified Appliance Removal upon Sale of Building** as per Bend, Oregon.

A template bylaw should include this theme as it is politically more viable to target new people to the community than people who have already supported a politician

**How to deal with low income families?**

Enact the bylaw incrementally to help ease people into new practices, especially those with lack of choices or those living in rural areas. Consider offering low interest loans.

**Adaptability – Updating bylaws**

Many bylaws become out of date. Perhaps an updating mechanism should be written into the bylaw. Mechanisms could include an expiry date, a review date, or a renewal date.

**Outdoor burning (other than open burning)...** how do you deal effectively with that? I.E.. Chiminea or outdoor fireplaces - perhaps these need to be regulated as a solid wood fuel burning appliance. Therefore covered under current provincial laws.

**Restricting the total number of appliances within a community**

This kind of bylaw puts a cap on the total number of appliances allowed within a community. People wanting to own a wood burning appliance would have to buy a certain number of permits, but there are a limited number of these permits. Once the limit is met, no more permits can be purchased. Or alternatively, upgrading existing old stoves could permit additional new clean burning appliances without adding to the airshed.

The town of Telluride, Colorado, has an interesting approach to this kind of bylaw where they restrict the use of solid fuel burning devices and have an offset program of permit trading which requires that the owners of a new solid fuel device purchase two permits from existing owners. The substitution of one for two devices automatically reduces the total number in existence, but still allows limited use of new wood-burning devices when demand exists.

*In the mid afternoon the two groups came back together and presented their ideas to each other and discussed what the next steps would be. The project team agreed to summarize and circulate the day's work in a report form and make best effort to draft a set of template bylaws for everyone to review.*

*End of workshop notes.*

***Thirty-Jurisdiction Review of Bylaws, Ordinances, Regulations and Legislation regarding indoor wood burning.***

Bylaw Theme	Strengths	Concerns	Notes	Who's doing it
<p><b>Education and Communication</b>                      Examples:                      Burn it Smart Program, workshops and website, Wood Stove Change outs, Puget Sound Web site, Spokane Web site, Whitehorse ads</p>	<p>All bylaws will work more effectively if they have an education and communications component that targets home owners, industry representatives, realtors, planners, developers, building inspectors and city councilors.</p>	<p>Education has a price tag.</p>	<p>Local councils and their staff need to hear positive messages regarding the benefits and low political cost of such bylaws despite loud public outcry by a small minority of the population. Social marketing messages need to be timely, grounded in science and draw on positive lessons from other jurisdictions.</p>	<p>Central Okanagan, B.C. and many others.</p>
<p><b>Emission Standards for new woodstoves and fireplaces</b>                      Bylaws with this theme prohibit the installation and in some cases the sale of devices that do not meet specified standards. The standards are usually met by the American EPA approved appliances (specifically Part 60, Title 40, Subpart AAA, Code of Federal Regulations Phase II appliances that emit not more than 4.1 grams per hour of PM10 emissions for catalytic and 7.5 grams per hour for non-catalytic appliances), or the Canadian CSA B415.1-92 certified appliances (but I don't think any appliances are certified CSA B415.1-92 ), but sometimes a jurisdiction will have a local emission standard as well.</p> <p>Sample bylaw wording:                      No solid fuel burning appliance shall be permitted to be installed within the Town unless the solid fuel burning appliance is:                      An EPA Certified Appliance meeting the emission requirements for Phase II certification;                      A pellet fueled wood heater;                      An open masonry fireplace supplied with gas and fitted with artificial logs;                      One open masonry fireplace located in a hotel/motel lobby or similar common area lobby or in the common area of a condominium project; or                      A zero clearance fireplace that is not an EPA Certified Appliance and is approved for use by the San Luis Obispo Air Pollution Control District as shown on their most current "List of APCD-Approved Woodburning Devices" (Truckee, Nevada Title 7 Air Quality 7.03.020)</p> <p>A person who carries on business in British Columbia as an appliance manufacturer, wholesaler or retailer must not sell for use or for resale an appliance manufactured on or after November 1, 1994 unless the person                      (a) ascertains, on the basis of testing carried out in accordance with section 3, that the appliance conforms to either                      (i) the particulate emission requirements of the Canadian standard, as determined by the test methods and procedures in that standard, or                      (ii) the particulate matter emission limits set out in the US Standard, as determined by the test methods and procedures in that standard, and                      (b) ensures that, at the time of the sale, the appliance bears a permanently affixed label that                      (i) is readily visible or accessible,</p>	<p>Such a focused bylaw is easier to enforce as it can be tracked through permits, often building permits.</p> <p>Encourages the sale, and thus the manufacture of more advanced technology stoves</p> <p>Engages the hearth products industry</p>	<p>Old appliances last a long time so turn-over to new stock is slow.</p> <p>Old appliances could still be in use either through second-hand sales or by their original owner in another building (garage, cottage)</p> <p>Bylaws, like B.C.'s, that just prohibit the sale or manufacture of non-complying appliances do not deal with the problem of consumers who choose to purchase a non-certified appliance from another province and use it in B.C.</p>	<p>Some bylaws, like the one for Truckee, Nevada limit total emissions from a residential unit, to cover off the residences that have more than one appliance. Sample wording:</p> <p>Some jurisdictions, like Larimer County, CO pair this bylaw with an incentive to convert to new appliances by waiving the building permit fee associated with conversion of or to such units.</p> <p>Fort Collins also has "ZILCH -- Zero Interest Loans for Conservation Help" to help residents remove or replace non-certified stoves. "Through ZILCH, the City loans between 80% to 95% of the cost of each project based on the pollution-reduction achieved. The maximum loan for upgrades is \$2,300. The maximum loan for removal of units is \$500."</p> <p>Santa Rosa, CA went further with its bylaw by stating that no solid fuel burning appliance shall be permitted to be installed <i>or</i></p>	<p>Central Okanagan, B.C.;                      Washington State;                      Santa Rosa, CA;                      State of Oregon;                      British Columbia;                      Whitehorse, YT;                      Comox, BC;                      Boulder, CO;                      Feather River, CA;                      Jackson County, OR;                      Larimer County, CO;                      Fort Collins, CO;                      Berkeley, CA;                      Crested Butte, CO;                      Livermore, CA;                      Central Okanagan;                      Juneau, AS;                      Truckee, NV;                      Spokane, WA;                      Shasta County, CA;                      Santa Rosa, CA;                      San Jose, CA;                      Rapid City, SD;                      Los Gatos, CA;                      Petaluma, CA;                      Palo Alto, CA;                      Morgan Hill, CA;                      Contra Costa county, CA;                      San Mateo county, CA;                      Berkeley, CA;                      Prince George, B.C.</p>

<p>(ii) conforms to the labeling requirements under the Canadian standard or the US standard, as the case may be,  (iii) indicates that the appliance conforms to the particulate emission requirements of the Canadian standard or to the particulate matter emission limits of the US standard, as the case may be, and  (iv) is accurate in all material respects.  (2) Subsection (1) does not apply to a sale of an appliance by a person who has reasonable grounds to believe that the person acquiring the appliance does so solely for the purpose of use outside British Columbia or of resale outside British Columbia. (Solid Fuel Burning Domestic Appliance Regulation, Waste Management Act, 1994)</p>			<p><i>operated by 2004 unless it meets the specified requirements</i></p>	
<p><b>No Burn Periods</b>  Prohibit the use of uncertified stoves and fireplaces during a period of impaired air quality. Can be various stages of impaired air quality.  Example from Spokane County Air Pollution Control Authority  A first stage of impaired air quality is reached and curtailment may be declared when particulates ten microns and smaller in diameter (PM10) are measures at any location inside Spokane County at an ambient level of seventy five micrograms per cubic meter of air by a method which has been determined, by Ecology or the Authority, to have a reliable correlation to the federal reference method, CFR Title 40 Part 50 Appendix J, or equivalent. Under this stage a code such as "Yellow" is given and burning restrictions exist and only EPA approved or certified units can be used, or you must have a written exemption.   A second stage of impaired air quality is reached and curtailment may be declared when particulates ten microns and smaller in diameter (PM10) are measure at any location inside Spokane County at an ambient level of one hundred five micrograms per cubic meter of air by a method which has been determined by Ecology or the Authority to have a reliable correlation to the federal reference method, CFR Title 40 Part 50 Appendix J, or equivalent.  Under this stage a code such as "Red" could be given and the use of all solid fuel burning devices (wood stoves, pellet stoves, fireplaces, fireplace inserts) be prohibited. The only exception is a written exemption.   Any person responsible for a solid fuel burning device which is subject to curtailment and is already in operation at the time curtailment is declared under an episode, or a stage of impaired air quality shall extinguish that device by withholding new solid fuel for the duration of the episode of impaired air quality. Smoke visible from a chimney, flue or exhaust duct after a time period of three hours has elapsed from the time of declaration of curtailment under an episode or a stage of impaired air quality shall constitute prima facie evidence of unlawful operation of an applicable solid fuel burning device.</p>	<p>Strong message that EPA certified appliances are better than non-certified appliances</p>	<p>This system was phased out in Juneau, Alaska because neighbours grew a perception that it was not a level-playing field, especially since all saw that even clean burning certified stoves appeared to emit just as much smoke as non-certified stoves.  Whitehorse repealed a bylaw that included this because it did not have the resources to monitor and enforce it</p>	<p>Catchy slogan from Santa Rosa : "Spare the air tonight"   Juneau used to give notice of air quality alerts with mail-outs to every house, a 24 hour woodsmoke hotline, message on the weather forecasts, ads on the radio and roadside signs</p>	<p>Puget Sound Clean Air Agency;  Spokane, WA;  Shasta County, CA;  Santa Rosa, CA;  Rapid City, SD;  Albuquerque, NM;  Boulder, CO;  Feather River, CA;  Jackson County, OR;  Prince George, B.C.;  State of Oregon</p>
<p><b>Opacity Measurement:</b>  Example Wording:  A person shall not cause or allow emission of a smoke plume from any solid fuel burning device to exceed an average of twenty percent opacity for six consecutive minutes in any one-hour period. The provisions of this requirement shall not apply during the starting of a new fire for a period not to exceed twenty minutes in any four-hour period. (Spokane County Solid Fuel Burning Device Standards)</p>	<p>Objective measure of polluting effects of appliances  Nephelometers are cheap and accurate</p>	<p>Takes a long time to take an opacity reading  Requires resources for ongoing monitoring</p>		<p>Spokane, WA;  Jackson County, OR</p>

<p><b>Fuel Prohibitions</b>  Example Wording:  It shall be unlawful for any person to cause or allow any of the following materials to be burned in a solid fuel burning appliance:  Garbage; Treated Wood; Plastic products; Rubber products; Waste petroleum; Paints and paint solvents; Coal having a sulfur content of more than 0.5 percent by weight as measured by ASTM Test Method D3177-84; Paper, other than amount of non-coloured paper necessary to start a fire; Any substance... which normally emits dense smoke or obnoxious odors; Salt Water Drift Wood; Any solid, semi-solid and liquid wastes generated from residential, commercial and industrial sources, including trash, refuse, rubbish, industrial wastes, asphaltic products, manure, vegetable or animal solids and semi-solid wastes, or other discarded solid and semi-solid wastes</p>	<p>Even when old appliances are being used, they will emit less if they are only burning clean, seasoned wood</p>	<p>May be difficult to enforce</p>	<p>Education component essential to this kind of bylaw's success</p> <p>Should also say what can be burned -- clean, seasoned wood</p>	<p>Central Okanagan, B.C.  Truckee, NV;  Puget Sound Clean Air Agency ;  Spokane, WA;  Shasta, CA; Santa Rosa, CA; San Jose, CA; Rapid city, SD; Los Gatos, CA;  Petaluma, CA; Palo Alto, CA; Morgan Hill, CA; Contra Costa county, CA; San Mateo county, CA; Feather River, CA; Jackson County, CO;  Montreal, PQ;  Vancouver, B.C.;  Prince George, B.C.</p>
<p><b>Non-certified Appliance Removal upon Sale of Building.</b>  Example Wording:  "The responsibility for removal of non-certified wood stoves or fireplace inserts shall be the responsibility of the seller of the structure which contains the non-certified wood stoves or fireplace inserts, unless the seller and buyer agree in writing that it shall be the buyer's responsibility." (Bend Code Chapter 9.18 - Woodstove Removal., Section 3.)</p> <p>This can be somewhat softened by the addition of the following type of clause:  The Community Development Director may grant an extension of time not exceeding six months after the sale or transfer of the real property for the buyer or transferee to comply with the requirements of this Chapter if the primary source of heat for the house is/are non-Town approved solid fuel burning appliances as determined by the Chief Building Official. (Truckee, Nevada Title 7 Air Quality 7.04.030 c)</p>	<p>In a fast real estate market, appliance change-over will be quickened</p>	<p>Fairly slow mechanism in a slow real estate market  Mechanism must be seen to be fair to seller and buyers and to not be a disincentive to buyer  Old appliances could still be in use either through second-hand sales or by their original owner in another building (garage, cottage)</p>	<p>Responsibility for this varies, but the more flexible bylaws have a chance of greater success and buy-in by realtors.</p> <p>State of Oregon DEQ Division 262, 340-262-0330 states "Any person selling a home which contains an uncertified woodstove shall provide to the Department or the Department's designated representative prior to the sale of the home, a copy of a receipt from a scrap metal dealer verifying that the stove has been destroyed."</p>	<p>Truckee, NV;  Santa Rosa, CA;  Bend, OR</p>
<p><b>Restricting the total number of appliances within a community</b>  This kind of bylaw puts a cap on the total number of appliances allowed within a community. People wanting to own a wood burning appliance have to buy a certain number of permits, but there are a limited number of these permits. Once the limit is met, no more permits can be purchased. The town of Telluride, Colorado, has an interesting approach to this kind of bylaw, as described below:</p> <p>In 1985 Telluride restricted the use of solid fuel burning devices and instituted an offset program of permit trading which required that the owners of a new solid fuel device purchase two permits from existing owners. The substitution of one for two devices automatically reduces the total number in existence, but still allows limited use of new wood-burning devices when demand exists.  Source: <a href="http://www.house.gov/jec/cost-gov/regs/cost/emission.htm">http://www.house.gov/jec/cost-gov/regs/cost/emission.htm</a> (see under "other successful trading programs").</p>	<p>May be more politically acceptable as it can be set up to target new-comers</p> <p>reduces the number of wood stoves while still allowing new installations.</p>	<p>What happens once nobody wants to sell anymore? At any price? Does this make wood heating only for the rich?</p>		<p>Telluride, Colorado</p>

<b>Registration Program for all uncertified appliances</b>	Can assist in targeting incentive and education programs promoting appliance change-outs Can assist in success of removal-at-sale bylaws	Sounds a bit like Canada's National Gun Registry and could be very politically unpopular in some communities		Truckee, NV
<b>New Construction</b> Solid fuel burning appliances shall not be the primary form of heat in any new construction.	Reduces future air quality concerns	Does not effect current problems caused by old appliances		Truckee, NV
<b>Dealing With Used Appliances</b> It shall be unlawful for any person to sell, offer for sale, supply, or install a used solid fuel burning appliance which has been removed from its dwelling unit or commercial or industrial building unless the appliance as been rendered permanently inoperable or unless it is an EPA Certified Appliance meeting the emission requirements for Phase II certification; or a pellet fueled wood heater.	Addresses the problem of old appliances staying in use.	May take away some incentive to upgrade to a new appliance as there will no longer be money from the sale of the old appliance to help purchase the new appliance.		Truckee, NV; Spokane, WA; Shasta, CA; State of Oregon; Feather River, CA
<b>Exemptions</b> Example Exemptions: Economic need ; Other heating system is inoperable; No other adequate source of heat and the structure was constructed or substantially remodeled prior to DATE; Exemptions valid for a period not to exceed one year. Renewals possible ;Special needs	Exemptions helps to soften the bylaw, which may make it more acceptable. The hard approach may bring neighbour disputes and preclude or reduce the effectiveness of an education program.	The municipality may be forced to exempt some really polluting appliances which may lead to neighbour disputes and cries of unfairness Could result in extra and cumbersome administration		Many
<b>Penalties</b> Penalties vary from criminal or civil, financial (highest I've seen is \$15,000 per day) to imprisonment (yay Whitehorse!)  Fort Collins, CO has a "Wood Smoke Response Hotline" "Residents who are concerned about excessive smoke or odour can contact the Natural Resources Department (221-6600) during normal business hours of 8:00 a.m. to 5:00 p.m. Monday through Friday. Callers are asked to identify the residence where the problem is occurring, or at least describe the approximate location. The City then sends a letter, a copy of City Law, and information about proper wood burning practices, to all homes in the area, including the problem address. The City continues to work with the caller and the residence in question until the issue is solved. While the caller always has the option of filing a formal complaint through Municipal Court, none of the complaints received over the past several years have required legal action."	Puget Sound Clean Air Agency has issued a number of penalties over the years for various types of violations. The most recent was for \$3,000 for burning garbage in a fireplace.		Some municipalities charge a fee for applications for permits that are higher for first installations than for replacement installations. (Crested Butte, CO is an example) One approach is to give warnings to first time offenders along with an education package, then a small fine, then... the works	