

A photograph of a snowy winter scene. In the foreground, a dark roof is partially covered in snow. A black chimney pipe rises from the roof, emitting a thick plume of white smoke that drifts upwards and to the right. The background is filled with evergreen trees heavily laden with snow, set against a clear blue sky. The overall lighting is bright, suggesting a sunny day.

Discussion Paper

Managing Residential Wood Smoke in Metro Vancouver

Bylaw Development Consultation Paper
September 11, 2017



Introduction

Metro Vancouver Regional District (MVRD, operating as Metro Vancouver) is responsible for managing and regulating air quality in the region under authority delegated from the provincial government in the *Environmental Management Act*. Metro Vancouver is committed to protecting the environment and regulating the discharge of air contaminants, including smoke from indoor residential wood burning.

Wood smoke is a mixture of fine particulate matter and many gases, including some toxic air contaminants. Sources of wood smoke in the region include indoor and outdoor residential wood burning, commercial wood fired ovens, campfires, land clearing and agricultural outdoor burning, and wildfires. Indoor residential wood burning is the largest single source of fine particulate matter emissions in the region, which contribute to levels of fine particulate matter that can cause health concerns. Studies indicate that increased wood smoke exposure can be associated with more than 30% increase in incidents of otitis media, the leading reason for clinical visits and antibiotic prescriptions for infants and young children. A key benefit of managing emissions from residential wood burning is improvement in ambient air quality, and more specifically, reduction in the levels of fine particulate matter in the air people breathe, with associated public health benefits.

Metro Vancouver has operated a wood stove exchange program since 2009 and offers workshops to promote best burning practices to reduce wood smoke emissions. However, research on best air quality management practices in other jurisdictions indicates that, in addition to use of good burning practices, limiting the use of wood burning appliances to low-emission devices is essential to minimize emissions from indoor residential wood heating.

In the spring of 2017 Metro Vancouver conducted preliminary consultation on potential regulatory options to reduce wood smoke emissions. The input received during that process informed the development of the proposals outlined in this bylaw development consultation paper.

Purpose

This bylaw development consultation paper describes the effects of wood smoke from indoor residential wood burning, outlines the principles that have guided the development of proposed measures to reduce wood smoke emissions, provides information about voluntary and regulatory measures employed in Metro Vancouver and other jurisdictions to address wood smoke concerns, and summarizes the proposals for a potential bylaw to reduce wood smoke emitted from indoor residential wood burning. These proposals would add an additional tool for wood smoke management in the region and build a comprehensive suite of measures to reduce the negative impacts from wood smoke from indoor residential wood burning on human health, local and regional air quality.

Metro Vancouver prepared this bylaw development consultation paper for parties with an interest in the proposed regulatory measures for managing wood smoke. In particular, Metro Vancouver is interested in input and feedback from people, businesses and organizations dealing with the issues associated with indoor residential wood burning or wood smoke, including:

- People impacted by smoke from indoor residential wood burning;
- People who burn wood in their homes;
- Public health experts and research organizations;
- Wood burning appliance manufacturers and retailers;
- Wood energy technicians;
- Representatives of other businesses involved in the use, installation, or maintenance of wood burning appliances;
- Realtors;
- Home insurance providers;
- Energy service providers (e.g. BC Hydro, Fortis); and
- Representatives of Metro Vancouver member jurisdictions.

Defining the problem

Residential wood burning is widespread in rural and urban areas across the region. In evenings in the fall and winter, periods of air stagnation and reduced dispersion of air pollutants can lead to the development of high, localized concentrations of fine particulate matter from wood smoke in residential neighbourhoods. In addition, in Metro Vancouver wood smoke emissions from residential wood heating occur near people's homes and in more densely populated parts of the region, so wood smoke from a single source has the potential to impact more people than may occur in rural areas of Metro Vancouver and the rest of the province.

Fine particulate matter is associated with chronic and acute respiratory and cardiac problems, particularly for children, the elderly, and people with existing lung and heart conditions. High levels of wood smoke close to where people live may exacerbate people's symptoms. Wood smoke also has a distinctive odour that can negatively affect residents' use and enjoyment of their environment, including inside their own homes. The concerns arising from these factors result in complaints and requests for help from members of the public and interest groups to reduce exposure to wood smoke.

Guiding principles

A regulatory strategy to address wood smoke emissions in Metro Vancouver would aim to:

- Minimize the risk to public health from emissions of residential wood smoke;
- Minimize the contribution of residential wood smoke to fine particulate emissions in the region;
- Address concerns expressed by members of the public about residential areas prone to residential wood smoke;
- Require the use of best practices such that only burning of clean, seasoned wood occurs, under circumstances where residential wood burning appliances are authorized to be operated; and
- Prevent undue burden or hardship for vulnerable members of the population who use wood burning as their primary source of heat, while maintaining the integrity of the objective of protecting human health



Working within the legislation

The provincial *Solid Fuel Burning Domestic Appliance Regulation* (SFB DAR) prohibits the sale of new wood burning appliances in British Columbia, unless they meet specific low emission certification requirements. The SFB DAR forms part of the existing regulatory framework for managing wood smoke in Metro Vancouver and has led to nearly all residential wood burning appliances sold in BC since September 2016 having been required to meet US Environmental Protection Agency (EPA) 2015 certification, or equivalent standards set by the Canadian Standards Association (CSA) in 2010. These standards certify wood burning appliance models that are capable of burning wood cleanly, with emission rates meeting acceptable limits. Although the SFB DAR ensures that replacement appliances installed in homes should not have higher emissions than the appliances they are replacing, emissions are largely uncontrolled after installation and depend on operators using good practices and clean burning fuels.

Metro Vancouver utilizes voluntary and regulatory measures to reduce residential wood smoke in the region. Provisions in *Greater Vancouver Regional District Air Quality Management Bylaw No. 1082, 2008* (Bylaw 1082) place restrictions on fuels burned and on the operation of residential wood-burning appliances. However, these restrictions have not fulfilled their intended purpose. Performance of wood burning appliances can be influenced by the type of appliance used, whether it is designed to be low-emission, and by following consistent good operating practices, which include burning clean, seasoned wood, and no prohibited materials which could cause additional negative impacts. Pressure treated or painted wood, plastics, particle board, MDF, plywood, saltwater driftwood, and cardboard are some examples of materials that are currently prohibited from being burned.



VANCOUVER HARBOUR ON JANUARY 21ST 2014, DURING A PERIOD OF STAGNATION.

Metro Vancouver has operated a wood stove exchange program since 2009 that offers incentives for residents to replace fireplaces and uncertified wood stoves with new lower emissions appliances. Metro Vancouver has also developed education materials and offered workshops to residents to promote wood burning best practices to reduce wood smoke emissions. Wood heat workshops provide information about techniques to improve the efficiency of wood burning and reduce wood smoke emissions. Good burning practices to minimize smoke include:

- Burning only clean, seasoned wood, with a moisture content of 20% or less;
- Never burning prohibited materials that can release toxic chemicals;
- Burning small, hot fires;
- Not damping or holding a fire overnight; and
- Getting your chimney inspected and swept regularly.

Since 2015, Metro Vancouver has utilized air quality bulletins to provide residents with guidance about localized air quality degradation and encourage people to take voluntary actions to reduce emissions. A smoke forecast is also made available between October and March through Metro Vancouver's air quality phone line to help residents determine when conditions are best for smoke to dissipate. Although voluntary actions supported by Metro Vancouver initiatives have reduced fine particulate matter emissions and will continue to do so, more robust regulatory initiatives are being considered to provide greater safeguards for air quality and public health in the region.

Some municipalities in Canada have regulated emissions from residential wood burning appliances in recent years, including the City of Montreal in 2015, the City of Port Alberni in 2012 and the Town of Smithers in 2006. These bylaws allow the operation of wood burning appliances as long as they meet specific particulate matter emission rates. Some of these bylaws include prohibitions around the use of wood burning appliances during periods when air quality is degraded. Analysis of air quality before and after wood smoke regulation in the San Joaquin Valley in California suggests that a regulatory approach to managing wood smoke emissions can be effective in providing air quality and health benefits.



Proposed regulation

Metro Vancouver is proposing to develop a regional bylaw to reduce wood smoke emissions from indoor residential wood burning. The proposed regulation would be a part of a comprehensive residential wood smoke management program that includes initiatives promoting cleaner burning practices and offering education on alternative heat options, fuel quality, and wood moisture content to improve burning efficiency and reduce emissions.

The regional wood smoke emissions regulation proposed for consideration would use a phased-in approach and comprises three elements:

- A seasonal restriction on the use of indoor residential wood burning appliances between May 15 and September 15;
- Registration for indoor residential wood burning appliances based on particulate matter emission levels; and
- Prohibition of emitting wood smoke from residential wood burning appliances, unless the device is registered or if other conditions apply.

These elements are illustrated in Figure 1 and described in more detail in the following sections. The proposed regulation would also replace and clarify the operating requirements with respect to allowable fuels and operation of appliances under Section 8 of the Air Quality Management Bylaw No. 1082, 2008.

The proposed regulation would not apply to Aboriginal spiritual ceremonies and rituals that may involve burning of traditional medicines including, but not limited to, cedar, sage, and willow bark.

Seasonal Restrictions

During warmer months of the year, between May 15 and September 15, residential wood burning appliances in the region would be prohibited from emitting wood smoke under the proposed regulation. This restriction would be applied to all residential indoor wood burning appliances, including but not limited to open hearth fireplaces, fireplace inserts, wood stoves, and pellet stoves. Appliances used only for cooking purposes would be exempt from the seasonal restriction.

The effective start date of the proposed seasonal restriction would be May 15, 2020

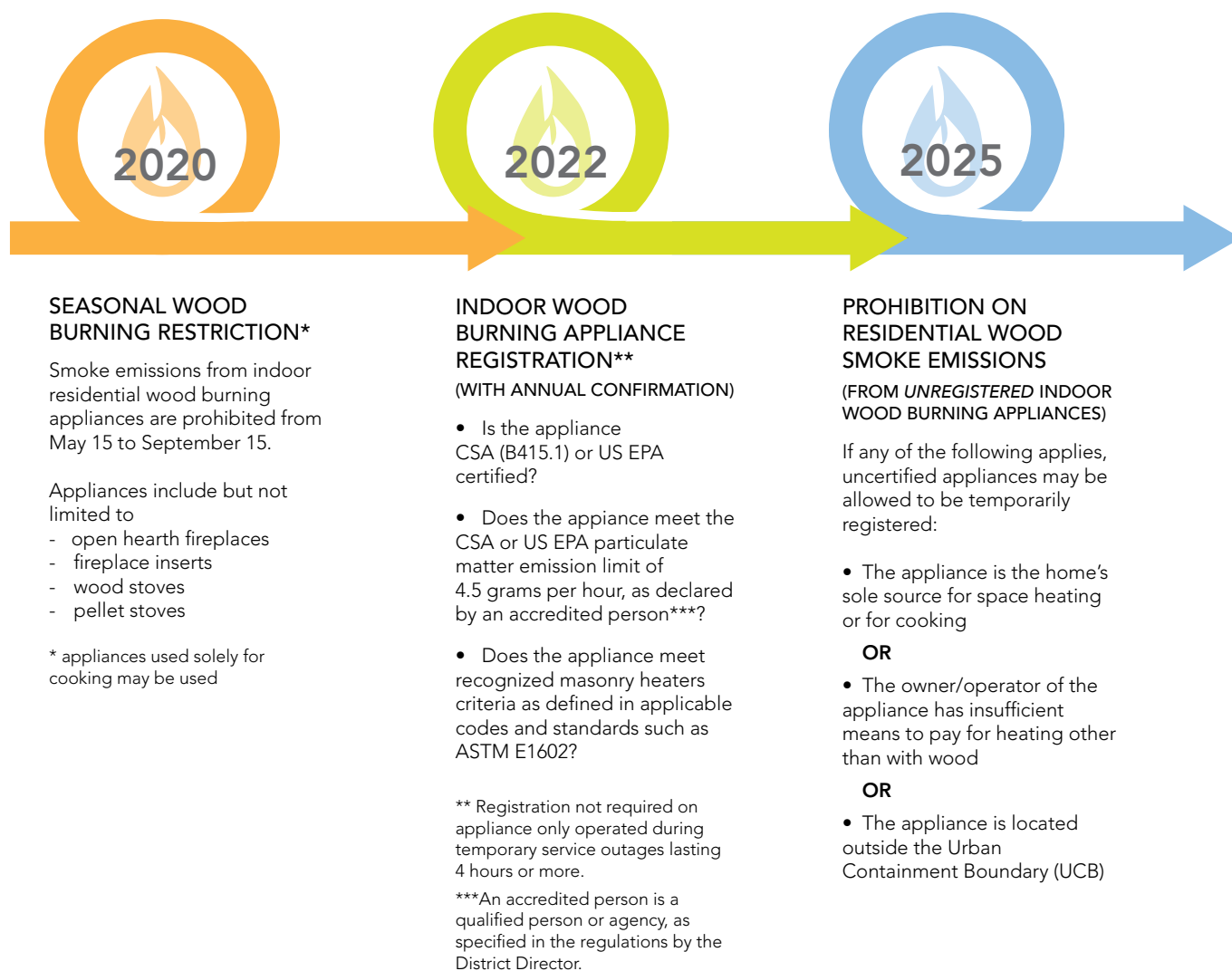


FIGURE 1 PROPOSED RESIDENTIAL WOOD SMOKE REGULATION TIMELINE

Registration of Wood Burning Appliances

Under the proposed regulation, people operating indoor residential wood burning appliances would be required to register their appliances to identify them as low-emitting wood burning appliances that meet adequate particulate matter emission levels. Applications for registration would be available at the appliance point of sale, or during installation, inspection, or maintenance by an accredited person, as well as other sources such as through Metro Vancouver directly.

An accredited person will have completed sufficient training, such as the Wood Energy Technical Training program, to ensure that the accredited person has the knowledge and professional competencies required to inspect and maintain wood burning equipment.

Appliances that would qualify for registration include:

- Wood burning appliances that are certified as meeting the CSA performance standard for solid fuel burning heating appliances (CSA B415.1) or US EPA emissions limits for new residential heaters. Newly installed appliances would be required to be CSA or US EPA certified according to the emissions limits applicable at the time of purchase; or
- Wood burning appliances that meet the CSA and US EPA particulate emissions criteria of less than 4.5 grams per hour as demonstrated by emissions testing conducted by a qualified person, or as certified by an accredited person; or
- Site-built or site-assembled wood-fueled heating appliances, consisting of a firebox, a large masonry mass, and a maze of heat exchange channels that are confirmed by an accredited person as complying with recognized masonry heater criteria as defined in applicable codes or standards, such as ASTM E1602.

Figure 2 shows a guide to the appliance registration process.



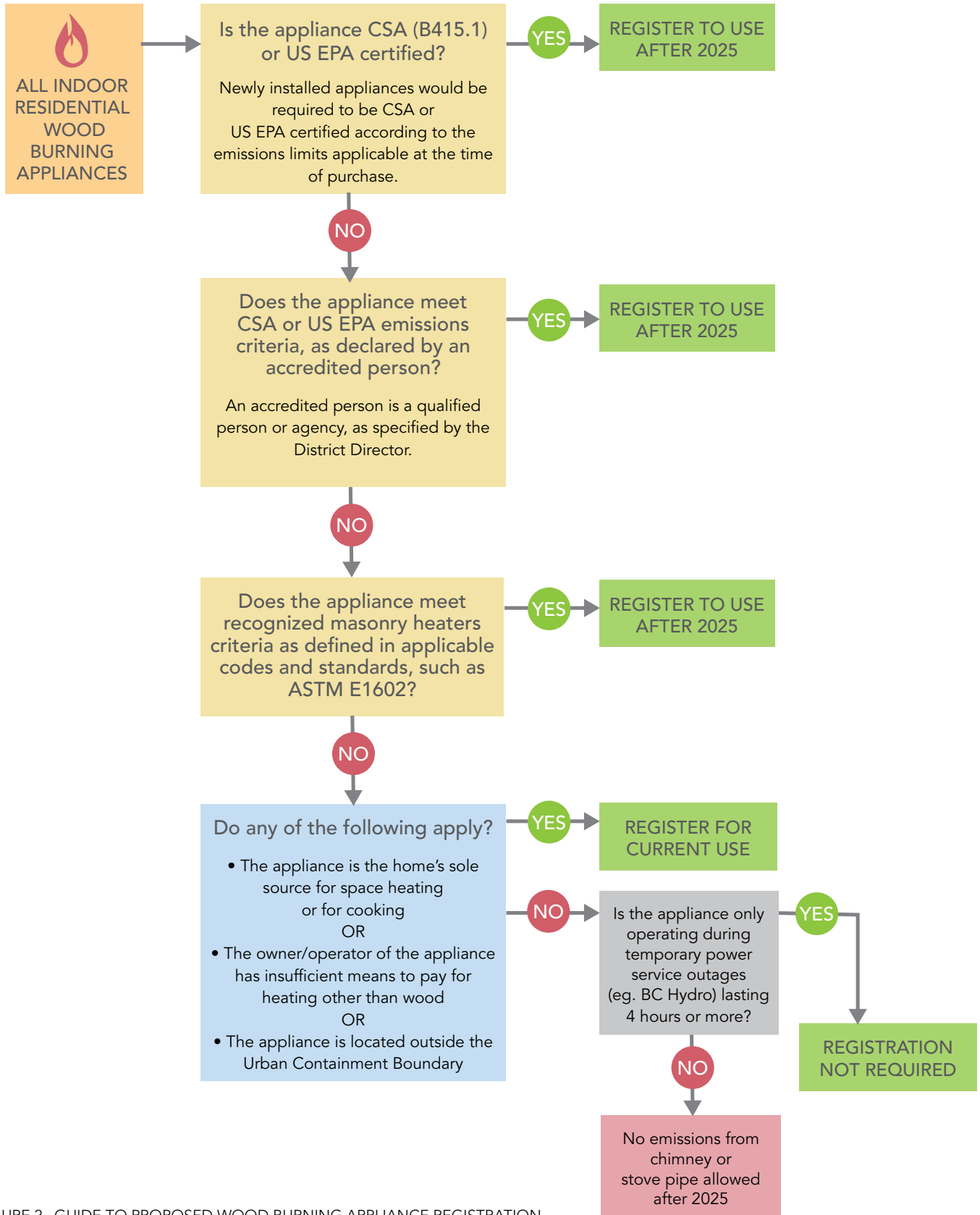


FIGURE 2 GUIDE TO PROPOSED WOOD BURNING APPLIANCE REGISTRATION

Registration would require a declaration form for each indoor residential wood burning appliance to be submitted to Metro Vancouver from the operator, signed by the operator and an accredited person confirming the following:

- The appliance installed at the residential address is certified or has otherwise been declared as being compliant with the requirements of Metro Vancouver’s bylaws;
- The operator has a copy of and agrees to follow the recommended operating procedures and fuel quality guidelines provided by the manufacturer or an accredited person;
- The operator has a copy of and agrees to follow Metro Vancouver’s recommended cleaner burning practices and maintaining fuel quality to minimize wood smoke emissions; and
- The number of appliances in a home as well as the location (main residence or ancillary building).

In the absence of meeting emissions requirements for registration, the operator could consent to an inspection by a Metro Vancouver officer, with applicable fees, to confirm the appliance’s acceptability for registration. All other appliances not meeting emissions requirements for registration would be designated as *unregistered* appliances, unless exemption criteria applied.

Participants in Metro Vancouver’s Wood Stove Exchange program could opt to have their appliances registered upon confirmation of program participation.

Reconfirmation of the status of *registered* wood burning appliances would be required annually to ensure that the certified appliance is still in place and to ensure that the current owner of the residence still has and agrees to use recommended operating practices and cleaner burning practices. This requirement is similar to registration of alarm systems required in some member jurisdictions. The role of municipal governments, the real estate industry, home insurance providers and others in ongoing registration processes can be examined.

All qualifying appliances would have to be registered from September 15, 2022 under the proposed bylaw.





Prohibition of Smoke Emissions

Under the proposed regulation, the emission of smoke from residential and ancillary buildings (e.g. garages or workshops) for which there is no registered indoor wood burning appliance would be prohibited after September 15, 2025. Unregistered appliances would not need to be removed.

During exceptional events, such as a power service disruption lasting four or more hours, the prohibition on emissions of smoke from unregistered indoor wood burning appliances could be suspended.

Exemption Criteria

Indoor wood burning appliances that do not meet the emissions limits criteria for registration could be registered if any of the following conditions apply:

- The residential wood burning appliance is the sole source of space heating or heat source for cooking in the home; or
- The owner of the appliance has insufficient means to pay for heating with a fuel other than wood; or
- The appliance is located outside the Metro Vancouver Urban Containment Boundary.

These criteria could be declared for any type of residential indoor wood burning appliance, including but not limited to open hearth fireplaces, fireplace inserts, wood stoves, pellet stoves and cook stoves. Appliances would be registered for the current burning season. Applications for registration under the above exemption criteria would be required to be made annually.

Implementation

A phased approach is being proposed to the implementation of the potential regulation to manage residential wood smoke from indoor residential wood burning. Subject to the approval of a bylaw by the MVRD Board, as outlined in this paper seasonal summer restrictions could start in 2020, registration requirements for indoor wood burning appliances could apply from 2022, and restrictions on emissions of wood smoke could apply from September 2025.

Providing comments on the proposed regulation

Metro Vancouver welcomes feedback on the proposed regulation to manage residential wood smoke from indoor residential wood burning. Opportunities to provide feedback include public open house events, online webinars, an online feedback form, and social media. Feedback may also be provided by email at RWB@metrovancover.org or telephone on 604-432-6200. Details about consultation events will be posted on the project webpage. For additional information about participating in an event, contact us by email at RWB@metrovancover.org or telephone on 604-432-6200.

To ensure your comments will be fully considered, please provide feedback **before January 15, 2018**.

Comments and suggestions will be compiled into a consultation summary report. Metro Vancouver will carefully consider all feedback when developing a bylaw proposal for managing wood smoke from indoor residential wood burning. Comments received after January 15, 2018 may be taken into consideration until the MVRD Board makes a decision about a bylaw regulating wood smoke emissions from indoor residential wood burning.

Metro Vancouver staff and contractors will treat comments received with confidentiality. Please note that any comments you provide and information that identifies you as the source of those comments may be publicly available if a freedom of information (FOI) request is made under the Freedom of Information and Protection of Privacy Act.

Thank you for taking the time to consider and provide input on these potential changes to residential wood smoke in Metro Vancouver



