

# Emission Limits for Biomass Boilers in British Columbia

## A. Provincial Standards

As of Dec 2010 there is no set provincial standards regarding emission thresholds for biomass-fuelled energy plants. Boilers used for agricultural applications, such as greenhouses, are the only exemption to this.

Agricultural biomass boiler and heaters are the only application that the Ministry of Environment (MoE) regulates using a standard. All other applications require a permitting process. The permit needs to be negotiated on an individual basis with the regional department of the MoE for the area that the plant is located in. MoE staff usually takes the agricultural boiler standard and recommendations for biomass-fired electrical power generation as a guidance, see below.

### 1. Agricultural Boiler Standard

Effective Sep 2010 the following emission thresholds are applicable for biomass boilers used in agricultural operations:

Table 1 – Emissions from Agricultural Boilers and Heaters Fuelled by Biomass

Item	Capacity of Boiler or Heater	Emission Standards (effective September 1, 2010)	
		Particulate Matter Limit	Opacity Limit
1	Exceeding 3 MW	35 mg/m <sup>3</sup>	10%
2	Exceeding 1 MW but not exceeding 3 MW	50 mg/m <sup>3</sup>	10%
3	Not exceeding 1 MW	120 mg/m <sup>3</sup>	20%

*Source: Agricultural Waste Control Regulation, Part 6, Section 18.1, see [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/10\\_131\\_92](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_131_92)*

Biomass boilers with a capacity above 1 MW or boilers using manufactured wood (such as MDF particle board etc) will need to get tested for compliance within 6 months of operation and at least once during each heating season. This standard is equivalent to Metro Vancouver's [Bylaw 1098 for Agricultural Biomass Boilers](#).

## 2. Guidelines for Power Generation Facilities fuelled by Biomass

Below table contains the emission standards that are recommended to MoE staff during the permitting process for bio-mass fired electrical power generation facilities.

Table 2: Emission Limits for Biomass-fired Electrical Power Generation

Size <sup>a</sup>	Parameter	Limit	Units <sup>b</sup>	Monitoring <sup>e,f,g</sup>
<b>&lt;25 MW</b> (megawatt of electrical output)	Total particulate <sup>c</sup>	50	mg/m <sup>3</sup>	Annual
	Opacity	-	% opacity	Daily
	Dioxin/Furan Teq <sup>h</sup>	100	picograms/m <sup>3</sup>	Annual
<b>≥25 MW</b>	Total particulate <sup>d</sup>	20	mg/m <sup>3</sup>	2 times/year
	In-stack Opacity	-	% opacity	Continuous
	Dioxin/Furan Teq <sup>h</sup>	100	picograms/m <sup>3</sup>	Annual

### Notes to Table 2:

- (a) Total cumulative output of all units at a facility.
- (b) Concentrations measured at standard conditions of 20°C, 101.3kPa, dry gas and 8% O<sub>2</sub>.
- (c) For new units, an operator would be required to undertake baseline monitoring (stack testing) within six months of start up and annually thereafter.
- (d) For new units, an operator would be required to undertake baseline monitoring (stack testing) within six months of start up and twice per year thereafter.
- (e) For significantly modified units, operators would be required to undertake additional baseline monitoring (stack testing) within six months of start up and the indicated requirements thereafter.
- (f) Monitoring for this guideline must be in accordance with the:  
British Columbia Field Sampling Manual — For Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment and Biological Samples  
January 2003.
- (g) Monitoring is required only if salt-laden wood is burned.

## 3. Guidelines for Biomass Boilers and Heaters in the Wood Processing Industry

Though there are currently still forty-five wood residue burners in the province that remain eligible to operate under the [Wood Residue Burner and Incinerator Regulation](#) (WRBIR) incinerators with no heat recovery have become largely obsolete. The BC Ministry of Environment intends to phase out the remaining incinerators and replace the Wood Residue Burner and Incinerator Regulation with a **Code of Practise for Biomass Boilers and Heaters in Sawmills**. The proposed revisions are outlined in a [policy intentions paper](#). A public consultation process starts in January 2011. The permitting process for biomass boilers in sawmills will remain in effect until further notice.

#### 4. BC Emission Criteria for Municipal Solid Waste Incinerators

Municipal waste incineration or burning industry means “*establishments engaged in the burning or incineration of waste, except hazardous waste, (a) originating from residential, commercial or institutional sources or from demolition, land clearing or construction sources, or (b) specified in a waste management plan.*” **The MSW regulation is applicable wherever the primary business proposed is the burning of commercial waste, regardless of the waste type.** Wood waste is the only exemption to this.

The Municipal Solid Waste Incinerator Regulations imposes stringent operation and monitoring requirements, such as turndown restrictions, minimum temperature requirements, and auxiliary burners. Operating a gasifier under these conditions while utilizing the energy created in the process may prove challenging. Emission limits are put on 17 substances, including particulates, sulphur dioxide and nitrogen oxide. Stack Emission Limits for Municipal Waste Incinerators are listed at [www.bcairquality.ca/reports/ecmswi.html#appa](http://www.bcairquality.ca/reports/ecmswi.html#appa)

#### B. Metro Vancouver Standards

Within the jurisdiction of the Metro Vancouver the Boilers and [Process Heaters Emission Regulation \(Bylaw 1087\)](#) and [Bylaw 1098 for Agricultural Biomass Boilers](#) regulate biomass boilers. The latter has the same emission limits as those given in Table 1 above.

All other boilers or process heaters fuelled by biomass limit filterable particulate matter emissions to 18 mg/sm<sup>3</sup> with an opacity not exceeding 5%. Emission must be tested for compliance within 3 month of start-up.

Metro Vancouver also requires the stack of biomass boilers to be 20 meter above ground level.

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