

Biomass Emissions Screening Tool (Version 7)

This Excel tool has been developed to help local authorities determine the maximum emission rate (in grammes per second) from a biomass combustion installation for which a risk of exceedance of the relevant air quality objective is unlikely.

The methodology consists of comparing, for each biomass installation identified (using Table 7.4 in LAQM.TG(16)), the actual maximum emission rate for pollutants against the Target Emission Rate calculated by the tool. If the actual emission rate is greater than the Target Emission Rate, then the local authority should proceed to further assessment of the installation, based on detailed dispersion modelling.

The tool is based on a series of nomograms developed as part of previous versions of LAQM Technical Guidance, but which are still considered relevant.

In order to use this tool, local authorities will need to gather the following information for each biomass installation requiring screening:

- Stack internal diameter;
- Actual stack height above ground level;
- Actual NO_x and PM₁₀ maximum emission rates;
- Height of nearby buildings, which may prevent good dispersion of the plume; and
- NO₂ and PM₁₀ background concentrations around the installation.

Procedure for using the Calculator:

1. Select the appropriate tool for the pollutant and application;
2. Insert the height of the highest building within a distance of 5 times the stack height;
3. Insert the diameter and height of the discharge stack;
4. Select the location of the development (Scotland or Rest of UK); and
5. Insert the annual mean background concentration of the relevant pollutant. The background concentration should take account of nearby roads or other local sources if there is potential for relevant public exposure.

The installations to which the calculator may be applied is limited by a number of factors, which are explained in the "Limitations" tab.

Further information with regards to screening biomass emissions is provided within LAQM.TG(16), available at

<https://laqm.defra.gov.uk/technical-guidance/index.html>

Either select the relevant sheet you require or use the links below (Jump to Tool column) to go directly to the relevant tool.

Pollutant	Objective Year	Average Period	Source Type	Jump to Tool
PM ₁₀	2004 & 2010	24-Hour / Annual	Biomass Combustion (Individual)	GO
NO ₂	2005 & 2010	Annual	Biomass Combustion (Individual)	GO
NO ₂	2005 & 2010	1-Hour	Biomass Combustion (Individual)	GO
PM _{2,5}	2020	Annual	Biomass Combustion (Individual)	GO
PM ₁₀	2004 & 2010	24-Hour / Annual	Biomass Combustion (Combined)	GO

If you require further information or support in using the Biomass Calculator Screening Tool, then please contact the LAQM Support Helpdesk.

Web: <https://laqm.defra.gov.uk/>
Telephone: +44 (0)800 032 7953
Email: LAQMHelpdesk@uk.bureauveritas.com

The LAQM Support Helpdesk is operated by Bureau Veritas UK, part of the Bureau Veritas Group.



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Limitations

The nomograms on which this calculator is based were developed for:

1. Biomass combustion installations in the range of 50kW to 20MW thermal input;
2. Installations with stack diameters in the range 0.1-1m;
3. A limited range of effective stack heights, dependent on the stack diameter shown in Table 1;
4. Discharge velocities shown in Table 1 – the calculator should not be used for discharge velocities less than those shown in Table 1 and will be conservative for higher velocities;
5. Discharge temperatures of 100°C – the calculator should not be used for lower discharge temperatures and will be conservative for higher discharge temperatures;
6. Flat terrain.

For larger biomass combustion installations, with discharge velocities greater than 10m/s, it may be appropriate to use the Industrial Emissions Screening Tool.

Table 1: Applicable range of effective stack heights and stack discharge velocities

Stack Diameter, m	Stack Height Range, m	Discharge Velocities, m/s
0.1	1-40	1.3
0.2	1-40	1.9
0.5	2-40	3
1	5-40	4.2

PM₁₀ Emissions from Biomass Combustion Stacks (Individual Installations)

Additional Comments/Information

The target emissions of PM₁₀ in g/s from biomass combustion source emissions are calculated for your given stack details. Greater emission rates may result in exceedance of the 24-hour objective for PM₁₀ in England, Wales and Northern Ireland or the annual mean objective in Scotland.

Enter required information in Yellow Cells
Resulting Emission in Red Bold

Building height	<input type="text" value="9"/>	m
Stack diameter	<input type="text" value="0.25"/>	m
Stack height	<input type="text" value="11.7"/>	m
Location	<input type="text" value="Rest of UK"/>	
PM ₁₀ Annual mean background concentration (include roadside contribution at relevant receptors)	<input type="text" value="15.316381"/>	µg/m ³
Calculated Effective stack height	<input type="text" value="4.5"/>	m
Target Emission Rate	<input type="text" value="0.027"/>	g/s

If the maximum stack emission rate is less than the target above then it is not likely that the most stringent objective for PM₁₀ will be exceeded. If your emissions are greater then please refer to LAQM.TG(16) for further advice.



NO_x Emissions from Biomass Combustion Stacks (Individual Installations) - Annual Mean NO₂ Objective

Additional Comments/Information

The target emissions of NO_x in g/s from biomass combustion source emissions are calculated for your given stack details.
Greater emission rates may result in exceedance of the annual mean objective for NO₂.

Enter required information in Yellow Cells
Resulting Emission in Red Bold

Building height	<input type="text" value="9"/>	m
Stack diameter	<input type="text" value="0.25"/>	m
Stack height	<input type="text" value="11.7"/>	m
Location	<input type="text" value="Rest of UK"/>	
NO ₂ Annual mean background concentration (include roadside contribution at relevant receptors)	<input type="text" value="9.776168"/>	µg/m ³
Calculated Effective stack height	<input type="text" value="4.5"/>	m
Target Emission Rate	<input type="text" value="0.1458"/>	g/s

If the maximum stack emission rate is less than the target above then it is not likely that the annual mean objective for NO₂ will be exceeded. If your emissions are greater then please refer to LAQM.TG(16) for further advice.



NO_x Emissions from Biomass Combustion Stacks (Individual Installations) - 1-Hour Mean NO₂ Objective

Additional Comments/Information

The target emissions of NO_x in g/s from biomass combustion source emissions are calculated for your given stack details.
Greater emission rates may result in exceedance of the 1-hour mean objective for NO₂.

Enter required information in Yellow Cells
Resulting Emission in Red Bold

Building height	<input type="text" value="9"/>	m
Stack diameter	<input type="text" value="0.25"/>	m
Stack height	<input type="text" value="11.7"/>	m
Location	<input type="text" value="Rest of UK"/>	
NO ₂ Annual mean background concentration (include roadside contribution at relevant receptors)	<input type="text" value="9.776168"/>	µg/m ³
Calculated Effective stack height	<input type="text" value="4.5"/>	m
Target Emission Rate	<input type="text" value="0.082"/>	g/s

If the maximum stack emission rate is less than the target above then it is not likely that the 1-hour mean objective for NO₂ will be exceeded. If your emissions are greater then please refer to LAQM.TG(16) for further advice.



PM₁₀ Emissions from Biomass Combustion Stacks (Combined Installations)

Additional Comments/Information

The annual emissions from a 500m × 500m square (the threshold emissions density) that may give rise to an exceedance of the annual mean objective (in Scotland) / 24-hour mean objective (Rest of UK) for PM₁₀ for a particular background concentration.

Note, for the purpose of this tool, the following is typically assumed for Area Type:

Enter required information in Yellow Cells
Resulting Emission in Red Bold

Location

Rest of UK

Area Type

Village

PM₁₀ Annual mean background concentration
(include roadside contribution at relevant receptors)

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Threshold Emission Density

9550 kg/year

- Village ~ 1km²
- Small Town ~ 4km²
- Large Town ~ 16km²

If the emissions density is less than the Threshold Emissions Density, then it is not likely that the most stringent objective for PM₁₀ will be exceeded. If it exceeds the Threshold Emissions Density, then the authority should proceed to detailed dispersion modelling and/or monitoring - please refer to LAQM.TG(16) for further advice.

