

Air Quality and Biomass: Guidance for Local Authorities in Scotland

1. Introduction

In November 2014, during a stakeholder meeting on biomass, chaired by the Minister for Business, Energy and Tourism, a need was identified for guidance to be produced for local authorities on air quality and biomass. The purpose of this guidance would be to pull together information on existing guidance and legislation, to help support local authority Environmental Health Officers and Planners in their assessment of planning applications for new biomass boiler installations. Consequently, the following document was produced.

2. Background: Biomass and the RHI, how emissions are regulated

- 2.1 The Renewable Heat Incentive (RHI) is a GB Government scheme set up to encourage uptake of renewable heat technologies amongst householders, communities and businesses through financial incentives. It is the first of its kind in the world. The UK Government recently announced that the budget for the Renewable Heat Incentive would be increased to £1.15bn in 2020/21 from the existing £430m in 2015/16. However the Chancellor also indicated that the RHI would be subject to £700m of savings over the coming years.

- 2.2 To date, the majority of RHI installations in the UK have been biomass boilers, with the primary fuel source being wood fuel. On the 12th of December 2014, Scotland had 1,180 RHI accredited biomass installations with a total capacity of 250 MW.
- 2.3 The Scottish Government is highly supportive of the increasing role that biomass heat and combined heat and power schemes are playing in reducing CO₂ emissions and generating local economic benefits, particularly in off gas-grid areas, at an appropriate scale. It recognises that biomass has a crucial role if the country is to meet its 2020 renewable heat target of 11% of heat supplied from renewable sources. However, there are air quality issues associated with biomass that need to be considered for new installations.
- 2.4 The principal emissions from burning wood in biomass boilers are gases and particulate matter (PM). The gas emissions include: carbon dioxide (CO₂), carbon monoxide (CO), water vapour, nitric oxide (NO) and nitrogen dioxide (NO₂), collectively known as (NO_x). For more information on biomass fuels, combustion and emissions see the following report:
www.cibse.org/knowledge/cibse-am/am15-biomass-heating-new-2014
- 2.5 In 2013, the UK government introduced legislation to ensure that boilers installed under the RHI do not exceed a maximum level of PM and NO_x. The maximum permitted emissions are 30 grams per gigajoule (g/GJ) net heat input for PM and 150g/GJ for NO_x (expressed as NO₂).
- 2.6 These emissions criteria do not apply to RHI boilers which were installed and accredited before 24th September 2013. For those installed on, or after this date, in order to claim the RHI, users must supply an emissions certificate. Boiler manufacturers must also provide testing certificates to prove boilers meet the maximum concentration standards under laboratory conditions. An emissions certificate template is available here:
<https://www.ofgem.gov.uk/sites/default/files/docs/2014/03/rhiaiqualityemissionscertificatemarch2014web.docx>

- 2.7 Large biomass installations (>20MW capacity), and any installations where waste is used as fuel have additional requirements and are regulated by the Scottish Environment Protection Agency (SEPA). More information is available here:http://www.sepa.org.uk/media/155820/ppc_technical_guidance_tg22_biomass_combustion.pdf

3. Guidance for Local Authorities

- 3.1 In 2010, Environmental Protection UK (EPUK) produced "Biomass and Air Quality Guidance for Scottish Local Authorities", which provides detailed advice. It can be found here:
http://www.iaqm.co.uk/text/guidance/epuk/biomass_guidance_s_cotland.pdf
- 3.2 Air quality impacts of biomass combustion depend on the size of the installation, the density or number of boilers and the PM load. The level of response required by Local Authority planners will depend upon the nature of the development and its location, e.g. Air Quality Management Area or urban area.
- 3.2.1 The combined impact of a number of small individual biomass developments may be significant. A single large boiler will tend to produce lower emissions than a series of smaller units using the same fuel for the same energy output.
- 3.2.2 Small individual domestic biomass boilers (less than 16.12kW) are regulated by the building regulations and are unlikely to be individually significant to local air quality in most circumstances.
- 3.2.3 Individual domestic or commercial biomass less than 50kW are also unlikely to be individually significant.
- 3.2.4 Biomass combustion in the range of 50kW to 20MW thermal input may individually have a significant impact upon local air quality. They must be screened and may be required to consider air quality in detail.
- 3.2.5 As previously mentioned, biomass combustion larger than 20MW, or of any size burning waste, will be regulated by SEPA.
- 3.3 There are multiple ways in which air quality issues can be addressed and applications for developments which include the

installation of a biomass combustion appliance must include enough information for the Authority to screen the development.

- 3.4 It is recommended that a developer seeking to use biomass should be issued with the EPUK information leaflet "Biomass and Air Quality Information for Developers":
http://www.iaqm.co.uk/text/guidance/epuk/biomass_developers_leaflet.pdf
- 3.5 They should also be provided with the standard "Biomass Boiler Information Request Form" for the local authority. The completed form should be submitted with the application. A template for the information request form that may be adapted for the local authority is available at:
http://www.iaqm.co.uk/text/guidance/epuk/biomass_boiler_information_request.doc.
- 3.6 This information should be assessed against the guidance contained in the Local Air Quality Management Technical Guidance, LAQM.TG(09):
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69334/pb13081-tech-guidance-laqm-tg-09-090218.pdf
- 3.7 A spreadsheet replicating the nomograms in the LAQM.TG(09) is available here: <http://www.scottishairquality.co.uk/laqm/tools>
- 3.8 For some developments more detailed dispersion modelling will be required. For example, where a Local Authority has an Air Quality Management Area (an area where national air quality objectives are unlikely to be achieved), or is close to declaring one then modelling is recommended.
- 3.9 In instances where biomass replaces an old coal or oil boiler, emissions may be reduced. However, where biomass replaces gas, the likelihood is that emissions will increase without appropriate mitigation measures.
- 3.10 Local authorities have powers under the Clean Air Act 1993 to request the measurement of dust emissions from a biomass boiler exhaust stack and also to require emission clean-up

equipment to be installed to control emissions. For more information on the legislative routes for tackling air emissions see: <http://www.environmental-protection.org.uk/committees/air-quality/air-pollution-law-and-policy/air-pollution-laws/>

- 3.11 The correct flue height/s must be applied in the design and construction phases of biomass projects to ensure adequate dispersal of emissions at a sufficient height.
- 3.12 Professional and competent installation of biomass systems is critical to achieving complete combustion of wood. Proper management of the fuel supply is vital; wood with consistent moisture content, size, and density offers better performance and lower emissions.

EPUK has developed a range of guidance for biomass installations, including an inventory template and a unit conversion and screening tool. These and other useful documents can be found here:

<http://www.iaqm.co.uk/text/guidance/epuk>