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## **Consultation on the Renewable Heat Incentive**

We are writing in response to the above consultation. Environmental Protection UK has considered the consultation document and welcomes the opportunity to comment on the proposals.

### **1. About Environmental Protection UK**

Environmental Protection UK brings together organisations from across the public, private and voluntary sectors to promote a balanced and innovative approach to understanding and solving environmental problems, through policy development and education. We are a registered charity with 110 years experience of environmental campaigning, public information provision, producing educational resources and policy formulation.

Environmental Protection UK's air quality policy committee has been involved in the development of this response. The committee brings together policy makers, regulators and practitioners from local authorities, consultants, developers, academics, industry, interested NGOs as well as members from Environmental Protection UK's regional divisions.

### **2. Responses to Consultation Questions**

Our response to the RHI consultation relates only to our views on the emission standards for biomass boilers, question 9 in the consultation document. This is not to say, however, that we are considering the question of emission standards in isolation, and we appreciate the wider role of the RHI in encouraging take up of renewable heat to meet the targets set in the Climate Change Act and the EU Renewables Directive.

**Q9: Do you agree with the proposed emissions standards for biomass boilers below 20MW? If not, why, and do you have any evidence supporting different ones, in particular on how they safeguard air quality?**

We do not agree with the PM<sub>10</sub> emission standards proposed in the consultation document, and have reservations with those proposed for NO<sub>x</sub>.

We understand that the emission standards have been revised over those suggested in 2009's Renewable Energy Strategy due to concerns that there are few boilers on the market that could meet the tighter 20g/GJ PM<sub>10</sub> and 50 g/GJ NO<sub>x</sub> standards. Whilst this is a valid argument for a scheme aiming to start in April 2011, we believe that the standards should be set at a level which incentivise manufacturers who produce 'clean' boilers, rather than a level which essentially allows the vast majority of boilers on the market to comply. With this in mind we suggest that emission standards should be set at:

- PM<sub>10</sub> – 20 g/GJ, as originally suggested in the Renewable Energy Strategy
- NO<sub>x</sub> – We would support the 150 g/GJ standard, but with the proviso that a clear signal is sent that the Government will look to tighten this standard when the RHI is reviewed in 2013. This is hinted at in the consultation document, but could be set out with greater clarity in the Government's response to the consultation.

We are also concerned that proposals in paragraph 4.171 of the RES, for associating adherence with manufacturers' maintenance schedules with emissions standards, appear to have been dropped in the final RHI proposals. Regular maintenance is essential to ensure that biomass plant operates efficiently and emissions performance is maintained. Linking proof that maintenance schedules have been adhered to with RHI payments would be a very effective incentive to ensure that this is carried out.

**The Need for Demanding Emission Standards**

At the current time total emissions of PM<sub>10</sub> and NO<sub>x</sub> from modern biomass plant are low, due to the small numbers of boilers and CHP units installed. However, what is clear from the emissions factors in Table 1 below is that increasing deployment of biomass boilers will impact, to some degree, negatively on air quality apart from in all but the most advantageous fuel substitution situations. This comes at a time when the UK is in breach of EU PM<sub>10</sub> Limit Values in London, and exceedances of EU NO<sub>2</sub> Limit Values are experienced across the whole country.

<i>Table 1 – Approximate PM<sub>10</sub> emission factors (energy input) from other sectors within the combustion industry<sup>1</sup></i>	
<b>Fuel</b>	<b>Emission factor (g/GJ)</b>
coal	120
fuel oil	12
gas oil	5

<sup>1</sup> Figures taken from 'Measurement and Modelling of Fine Particulate Emissions (PM<sub>10</sub> & PM<sub>2.5</sub>) from Wood-Burning Biomass Boilers', AEA 2008

This is not to demand that biomass should be drastically limited on air quality grounds – whilst air quality is driven by health impacts and the need to meet EU Limit Values, biomass deployment is equally driven by the carbon reduction agenda and the need to meet EU renewable energy targets. Instead we are suggesting that steps are taken to limit the air quality impacts of biomass deployment, and that any mitigation measures to offset air quality impacts are included in cost/ benefit analysis.

A letter provided by DEFRA/ DECC and the Scottish Government to local authorities in 2009 provided practical guidance on reducing biomass impacts; this was incorporated into guidance on biomass and air quality produced by ourselves and LACORS last year<sup>2</sup>. The letter suggested targeting biomass deployment into rural (or less polluted) areas, encouraging substitution of coal and oil fired heating with biomass, encouraging larger plant and mandating high quality plant (in terms of emissions) . Below we briefly review how local authorities have experienced implementing this guidance.

#### *Geographical Targeting*

As the majority of biomass deployment is currently driven by new development, and related planning conditions for renewable energy provision, the majority of biomass plant is still being driven into towns and cities rather than rural locations. Local authorities are generally dealing with this on a case-by-case basis at the development control stage, which creates a significant workload for the local authorities and frustrations for developers when issues with biomass plans are raised. Some local authorities are now reacting to this by developing planning policies for biomass, for example discouraging biomass in Air Quality Management Areas.

The RHI may well be a 'game changer' with biomass deployment driven by the desire to obtain RHI payments rather than by planning conditions. However, if this occurs it will reduce the ability of local authorities to control biomass deployment, as they can only exert control where biomass meets the planning system or Clean Air Act conditions.

#### *Encouraging Larger Plant*

Local authorities lack an effective lever to encourage larger plant through planning policy. The forthcoming Community Infrastructure Levy (CIL) appears to be one possible way to do this, with CIL contributions able to fund community heating infrastructure. At the present time, however, implementation of CIL is still developing, and it is unclear whether any local authorities will be using CIL in this way.

#### *Encouraging High Emissions Performance Plant*

At present there are few effective means of identifying the emissions performance of biomass boilers and CHP units, bar simple compliance with the Clean Air Act's 'exempt appliance' provisions. With little emissions information available to hand, several local authorities are now requiring particle filters for biomass boilers installed in new developments, as these appear to guarantee low particulate emissions.

### **Feasibility of Emission Standards**

<sup>2</sup> See [www.environmental-protection.org.uk/biomass](http://www.environmental-protection.org.uk/biomass)

Evidence we have seen from DEFRA suggests that a significant number of the boilers currently available can meet the 20 g/GJ PM<sub>10</sub> standard originally proposed in the RES. For those that cannot, filters are available that radically reduce both PM<sub>10</sub> and PM<sub>2.5</sub> emissions. Ceramic filters have already been fitted to a number of boilers in the UK due to planning conditions imposed by local authorities, or because of health concerns around PM<sub>10</sub> emissions. We understand that ceramic filters:

- Reduce PM<sub>10</sub> and PM<sub>2.5</sub> to below 5g/ GJ (please see attached results of laboratory testing by filter manufacturers)
- Add between 10-15% to the installed costs of the boiler (a figure provided by the filter manufacturers)

Whilst we understand that there is currently little data on the long term performance of ceramic filters in biomass applications, the technology has been proven in a number of other combustion applications. Glosfume, the supplier of most of the ceramic filters currently installed on biomass boilers in the UK, tell us that they have supplied more than 400 filters over the past 20 years. Filters need regular maintenance to ensure that performance is maintained, and filter elements may need to be replaced periodically, which can be undertaken as part of the regular servicing biomass boilers need to ensure high efficiency and good emissions performance.

One current restriction on greater deployment of filters in biomass applications is lack of a type approval scheme. We recommend that one is introduced as soon as possible, especially in the light of local policy initiatives that may see a large increase in filters being fitted (see next section).

DEFRA's evidence also suggests that very few boilers can meet the 50 g/GJ NO<sub>x</sub> target originally proposed in the RES, and there is no emissions control technology that we are aware of to cost effectively reduce NO<sub>x</sub> emissions from smaller biomass boilers. With this in mind we agree that it is impractical to impose a 50 g/GJ NO<sub>x</sub> limit at the present time. However, the fact that it is currently difficult to cost effectively achieve demanding NO<sub>x</sub> emission standards does not mean that this is technically unachievable, it is just that there has been little incentive to date for manufacturers to address NO<sub>x</sub> emissions. To encourage investment in low NO<sub>x</sub> technology a clear signal needs to be sent to boiler and emissions abatement equipment manufacturers that emission standards will be reviewed in 2013, with view to tightening the NO<sub>x</sub> standard. We understand that the current small size of the UK market for biomass boilers makes it difficult to influence manufacturers, who are almost entirely foreign concerns. However, we should plan for the RHI to be a success, and with the UK market likely to increase in size significantly the Government should enjoy much greater leverage with manufacturers in the future.

### **National and Local Policy Integration**

As we have alluded to above, many local authorities are concerned about the potential air quality impacts of biomass boilers, and some are starting to put in place planning policies for biomass. Most notable of these is the Greater London Authority, which in the recently released draft Mayor's Air Quality Strategy<sup>3</sup> proposes to require biomass boilers fitted in PM<sub>10</sub> Air Quality Management Areas to have abatement equipment (filters) installed.

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<sup>3</sup> See page 92 - [www.london.gov.uk/priorities/environment/vision-strategy/air-quality](http://www.london.gov.uk/priorities/environment/vision-strategy/air-quality)

Most local authorities will wish to align any emission standards with those contained within the RHI, however if these are not felt to be stringent enough many will be encouraged to set their own, more demanding standards. This would lead to a time consuming and frustrating situation for those installing biomass boilers, with different criteria applying in different local authority areas. The more stringent standards that we have proposed in this response would satisfy the vast majority of local authorities, with those experiencing particularly bad air quality problems (e.g. London) able to build upon them by stipulating filters in the most polluted areas.

### **Conclusions and Recommendations**

Minimising the air quality impacts of biomass plant puts us in the interesting position of planning to reduce a problem that we do not currently have – emissions from modern biomass plant are currently very low due to the small number installed. However, with the RHI likely to dramatically increase demand for biomass heat it is important that appropriate safeguards are put in place to ensure that air quality impacts are well managed, and any mitigation measures necessary are implemented.

DEFRA modelling suggests that air quality impacts can be minimised through the targeted deployment of biomass plant, and encouraging high emissions performance plant. The former is, however, by no means a given though, and local authorities and their partners are currently struggling to control biomass deployment, a situation which the RHI could entrench by encouraging biomass deployment that bypasses the planning system. With this in mind ensuring that appropriate emissions standards are in place becomes even more crucial, and it is for these reasons we are suggesting that demanding emissions standards are set and managed within the RHI framework.

In summary our recommendations for the emissions standards embedded with the RHI are:

1.  $PM_{10}$  – 20 g/GJ, as originally suggested in the Renewable Energy Strategy. Boilers that cannot meet this standard would still be eligible if appropriate emissions abatement equipment is installed
2.  $NO_x$  – The 150 g/GJ standard is retained, but a clear signal is sent (for example in the Government response to this consultation) that the standard will be tightened as soon as it is technically feasible
3. A type approval system is established for particulate abatement equipment (filters) alongside that set for boiler emissions
4. Documented proof of adherence with manufacturers' maintenance schedules for boilers and any abatement equipment installed is a condition of receiving RHI payments.

### **3. Contact Us**

If you require any further information on the views expressed in this response please contact:

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## **Appendix A – Testing Undertaken on a 70kW Pellet Fired Biomass Boiler (results supplied by Glosfume)**

### **Laboratory Testing for Total Particulate Matter.**

A proprietary boiler was fired on biomass wood pellets under laboratory conditions at a constant 70kW output. During which a series of particulate tests and flue gas measurements were undertaken both upstream and downstream of a ceramic filter. The results quoted below are an average of two tests undertaken on filter inlet and outlet. Also included are potential tolerances in the particulate test method.

**Upstream** (or Dirty) Flue Gas Particulate concentration of 47.2mg/m<sup>3</sup>, (as measured), 25mg/m<sup>3</sup> (corrected to 13% O<sub>2</sub> (dry)) equates to 17mg/MJ, ±3mg/MJ.

**Downstream** (or Clean) Flue Gas Particulate concentration 1mg/m<sup>3</sup>, (as measured), 0.55mg/m<sup>3</sup> (corrected to 13% O<sub>2</sub> (dry)) equates to 0.35mg/MJ, ±3mg/MJ.

Within the method of particulate measurement there is a potential error of ±4.5mg/m<sup>3</sup>, this equates to ±3mg/MJ.

Thus the ceramic filter would appear to be capable of reducing the total particulate burden encountered with biomass wood combustion to less than 5mg/MJ (5g/GJ).